Industrial Networking Solutions

- Industrial Ethernet
- Serial Connectivity and Networking
- Industrial Wireless
- Embedded Computing

MOXA®

www.moxa.com

Our Vision

To be a world-class leader in industrial-grade device networking solutions for automation

Our Values

Integrity
Mutual Respect
Customer Focus
Execution

Our Mission

To customers
Provide value-added service and quality products.

To business partners
Establish win-win business relationships based on trust and integrity.

To employees
Provide educational and career advancement opportunities, and share the company's success.

To society
Conduct regular educational programs and work to protect the environment.

Moxa at a Glance

The brand to ask for in industrial device networking

For over twenty years, industrial systems integrators have relied on Moxa products in major device networking installations all over the world. Moxa offers industrial-grade solutions backed by an excellent warranty and highly-specialized technical support for a diverse range of applications, including connecting PLCs to a wireless control network, transmitting temperature signals over long distances, and automating device control and monitoring at remote locations.

Trusted worldwide

Moxa was established in 1987 and has offices in Europe, the United States, China, and Taiwan. Working with a network of certified distributors, Moxa offers world-class industrial networking products to systems integrators and value-added resellers in over 60 countries. Clients place great trust in Moxa's business and environmental practices, which are backed by ISO 9001:2000 and ISO 140001 certification. All products obtain standard, internationally recognized certifications, as well as specialized certifications depending on client requirements.

Wide selection of products for connecting and controlling industrial devices

Moxa offers a comprehensive selection of products that are designed for device communication in industrial settings:

- Industrial Ethernet switches
- Device servers (including the award-winning NPort® series)
- Serial, Ethernet, and fiber optic media converters
- Industrial I/O
- Industrial IEEE 802.11 Wireless AP/Bridge/Client
- Industrial Cellular Solutions
- Embedded computing platforms
- Modbus gateways
- Industrial video networking solutions
- Multiport serial boards

Designed to exact specifications

In addition to standard product offerings, Moxa's expert R&D team can also deliver customized solutions for projects that have highly specialized requirements, including the development of specific technical functions or simple changes in connector type.

Quality Assurance

An all-encompassing commitment to quality

At the core of Moxa's competitiveness is an all-encompassing commitment to quality. One aspect of this commitment is Moxa's acceptance into the ISO 9001:2000 family of certified organizations, with annual certification by some of the most demanding auditors. In addition, Moxa has also achieved ISO 14001:2004 certification for adopting an environmental management system.

ISO 9001:2000

Research & Development, Manufacturing & Service, Quality product design

ISO 14001:2004

Environmental Management System

5-year product warranty

Most Moxa products carry a solid 5-year warranty.

Moxa's Green Products

The European Union's Waste Electrical and Electronic Equipment (WEEE) directive took effect in August of 2005, and the Restriction on Hazardous Substances (RoHS) directive was enforced starting in July of 2006. The Chinese government has also released its own RoHS directive that requires manufacturers to declare and control the use of hazardous substances.

Moxa is dedicated to producing "green products" that satisfy the WEEE and RoHS directives. We are also proud to be among the first in the industry to eliminate the use of perfluorooctanesulfonic acid in most of our products. In addition, all Moxa products carry UL, FCC, and CE certifications.

International Recognition

Moxa products receive top honors from industry groups

Moxa takes great pride in developing well-designed products that meet the needs of industrial users. Many of Moxa's products have been recognized by prominent industry groups for outstanding performance, design, and innovation.

- **2008/2009 Trend 100 Products, SPS Magazine**
  PT-7828 IEC 61850-3 Layer 3 Gigabit modular rackmount Ethernet switch
- **2008 Good Design Award**
  EDS-728 Industrial Gigabit modular Ethernet switch
- **2008 Red Dot Product Design Award**
  EDS-728 industrial Gigabit modular Ethernet switch
- **2007 Engineer's Choice Award, Control Engineering Magazine**
  W345 RISC-based wireless computer
- **2007 Product of the Year Finalist, Plant Engineering Magazine**
  EDS-P308 industrial PoE switch
- **2006 New Product Award, IEN Magazine**
  NPort W2004 wireless device server
- **2006 iF Product Design Award**
  EDS-726 industrial Gigabit modular Ethernet switch
- **2006 Engineer's Choice Award, Control Engineering Magazine**
  ioLogik E2210 Active Ethernet I/O server
- **2006 Taiwan Symbol of Excellence**
  AWK-1100 wireless access point
- **2004 Editor's Choice Award, Control Engineering Magazine**
  EDS-508 industrial Ethernet switch

Industrial Device Networking

Specializing in industrial communication interfaces and protocols

When working with industrial networks, one of the biggest challenges is finding a way to enable communication between devices that use different interfaces and protocols. Moxa products are designed to establish network connections for devices that use the following interfaces and protocols:

- RS-232, RS-422, RS-485
- PCI, PCIe
- 10/100/1000 Mbps Ethernet
- TCP, UDP
- DF1
- SNMP
- Single-mode and multi-mode optical fiber
- Modbus ASCII/RTU/TCP
- USB 2.0
- Analog and digital I/O
- IEEE 802.11a/b/g and IEEE 802.11n
- GSM, GPRS, EDGE, HSDPA, UMTS (cellular)
- CCTV video

Industrial-grade design

Moxa's industrial-grade products are tough enough to provide continuous, reliable, long-term operation in even the harshest industrial settings. Systems integrators will appreciate the fact that Moxa designs products with the following industry-friendly features:

- DIN-Rail, wall, and 19-inch rack mounting
- Low power consumption
- Redundant power inputs
- Optical isolation and ESD protection
- IP30/54/66/67/68 protection ratings
- Wide operating temperatures
- M12 connectors
- Easy to use software libraries
- Generous 5-year warranty on most products
- Industry certifications such as UL, CE, Class 1 Div 2, ATEX, DNV, GL
- Protection against shock and vibration
- Terminal block connectors

R&D

The world's best engineers and IT specialists

Moxa's products have the advantage of being engineered in Taiwan, one of the world's hottest spots for high-end electronics and information technology. Companies around the world rely on the high quality of components developed and made in Taiwan to maintain their own standards of quality and reliability. Industry specialists know that there is no better source for electronic components such as LCDs, touch screens, semiconductor wafers, ICs, PC motherboards, and more.

With direct access to Taiwan's talented labor pool, Moxa has assembled an expert R&D team that has developed innovative technologies and set new standards for the industry:

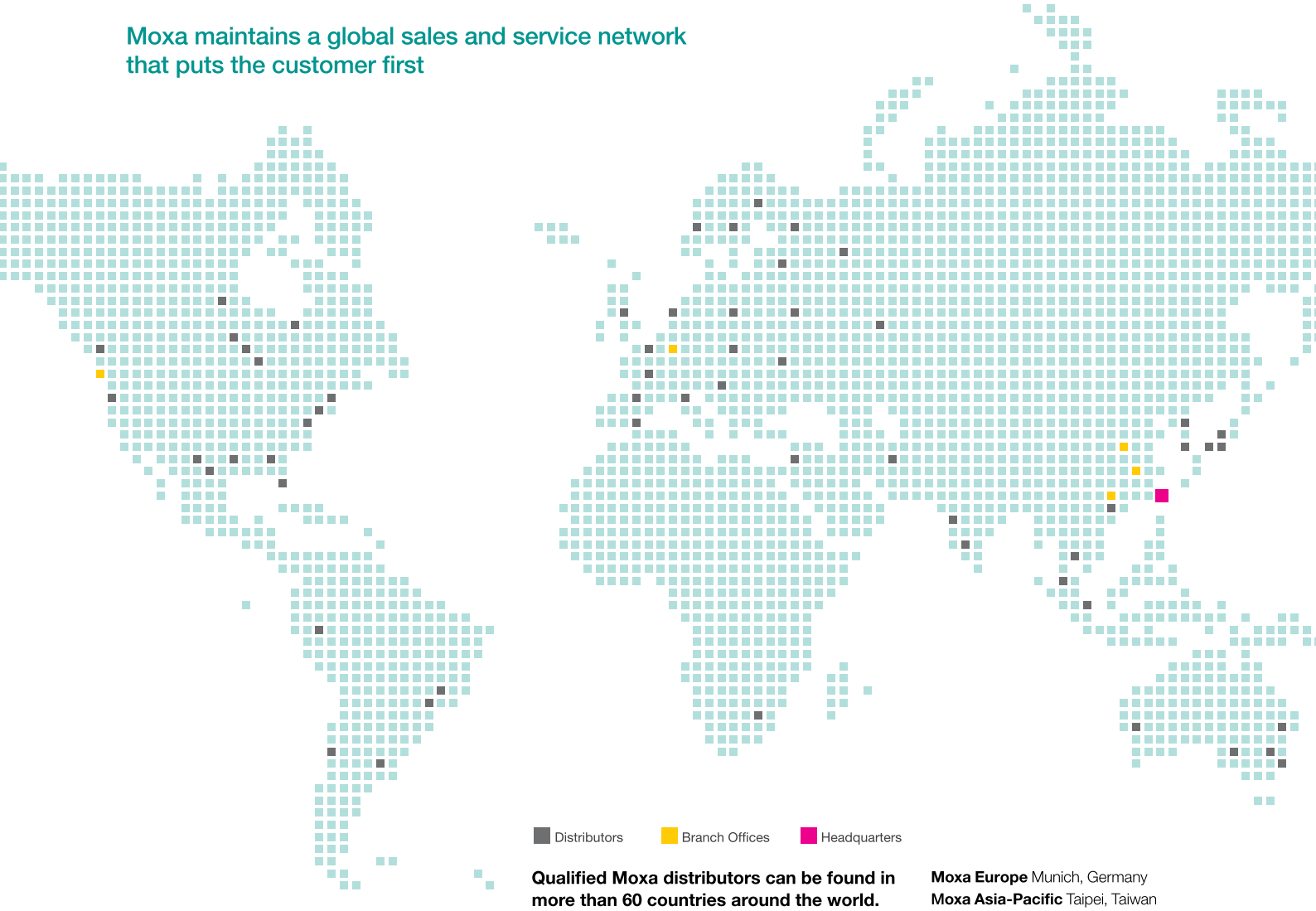
- Advanced Ethernet switch design for Turbo Ring™ redundant networking and a recovery time of under 20 ms
- Advanced serial communication via hardware-based ADDC® (Automatic Data Direction Control) in RS-485 communication
- Award-winning and intuitive Click&Go Logic for Active Ethernet I/O
- Flexible, reliable Windows/Linux Real COM driver and operation modes for serial-to-Ethernet applications
- The most up-to-date Windows drivers and WHQL compliance
- Wide selection of Linux and Unix drivers
- Turbo Roaming™: Industrial IEEE 802.11 solution for seamless connections and long-distance communication
- OnCell Central Manager: Centralized management solution for accessing private IPs from the Internet

In addition, we ensure in-depth support for your needs through our strong engineering capabilities:

- x86 and RISC-based embedded platform design
- In-house ASIC chip design

Sales and Service

Moxa maintains a global sales and service network that puts the customer first



Qualified Moxa distributors can be found in more than 60 countries around the world. Moxa headquarters is in Taiwan, and we have branch offices on three continents.

Moxa Europe Munich, Germany
Moxa Asia-Pacific Taipei, Taiwan
Moxa Americas Brea, California
Moxa China Beijing, Shanghai, Shenzhen

Milestones

1987
- Moxa founded by five high school class-mates

1988
- Moxa's first serial board released

1992
- Statistical multiplexer (MUX) released
- HDLC/BSC front-end sync board released

1994
- X.25 board for WANs released

1995
- Branch offices opened in China
- Byte magazine nominates Async server as "Best Connectivity Product"

1996
- Advanced ASIC chip developed for serial boards

1998
- PComm serial communication software released
- Internet sharing device released
- Windows 95/NT certification obtained for serial board driver

1999
- PCI serial board with small form factor released
- First NPort serial device server released

2000
- CN2500 async server released
- Device server with on-panel LCD released
- Serial board drivers developed for Linux
- Windows 2000 certification obtained

2001
- Serial board drivers developed for Windows XP
- Single-port device server released
- Industrial Ethernet switch released

International coverage

With Moxa offices in the United States, Europe, China, and Taiwan, users around the world can benefit from the highest level of technical expertise and professionalism. In addition, the MTSC (Moxa Technical Support Certification) program ensures that certified distributors deliver the highest standard of service.

Highly experienced sales professionals

Moxa sales reps take great pride in their deep understanding of the market and available technology. Clients can speak directly with a Moxa sales rep about detailed project specifications, testing requirements, and network architecture. In addition, all Moxa distributors are required to meet rigorous standards for quality, integrity, and technical proficiency.

World-class support

In every region of the world, users of Moxa products receive the highest level of support from teams of specialists that are trained and certified by Moxa. Integrators also benefit from Moxa's extremely responsive engineering team, which can tailor products to fit a project's special needs. Most Moxa products are also backed by a 5-year warranty, which is one of the most generous warranties in the industry.

2002
- US branch office opens in California
- Managed Ethernet switch released
- Serial-to-fiber converter released
- Universal PCI serial boards released

2003
- Moxa Technical Support Certification (MTSC) established
- Turbo Ring redundant network topology developed
- PC/104 serial boards released

2004
- Video servers released
- Embedded computer line introduced
- Dual-Ethernet terminal servers released

2005
- Control Engineering Editor's Choice award for EDS-508 Ethernet switch
- iF Product Design award for EDS-726 Ethernet switch
- ioLogik Ethernet I/O server released
- AWK wireless access point released

2006
- Europe branch office opens in Munich
- Control Engineering Engineer's Choice award for Active Ethernet I/O server
- Industrial Engineering News award for NPort W2004 wireless device server
- UPort USB-to-serial line introduced

2007
- OnCell industrial cellular modem released
- ioMirror peer-to-peer I/O server released
- Control Engineering Engineer's Choice award for W315 wireless embedded computer
- MGate Modbus gateways released

2008
- PowerTrans IEC 61850-3 Ethernet switch introduced for substation automation
- Good Design Awards and Red Dot product design award for EDS-728 modular Ethernet switch, NPort 6450 terminal server, and Modbus Gateway MB3270i
- Red Dot product design award for EDS-728
- Ranked among top 20 best companies to work for in Taiwan

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Chapter 14: An Overview of Embedded Computing

An Overview of Embedded Computing

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UC-8410 Series RISC-based, 8 serial ports, 3 LANs, DIO, CompactFlash, USB 15-25
UC-8416 Series RISC-based, 8 serial ports, 3 LANs, DIO, 8-port switch, CompactFlash, USB 15-28
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UC-7402 Series RISC-based, built-in web server, 2 LANs, PCMCIA, CompactFlash 15-34
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UC-7410/7420 Series RISC-based, 8 serial ports, 2 LANs, USB, PCMCIA, CompactFlash 15-39
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UC-7110/7112 Series Mini RISC-based computer, 2 serial ports, 2 LANs, SD 15-45
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Rackmount Solutions

DA-681 Series x86-based, 4 RS-232 and 8 RS-485 ports, 6 LANs, VGA, CompactFlash, USB 15-51
DA-682 Series x86-based, VGA, 4 Gigabit Ethernet ports, 2 expansion slots, CompactFlash, USB 15-54
DA-660/661/662/662-I RISC-based, 8 or 16 serial ports, Ethernet/fiber LAN, PCMCIA, CompactFlash, USB 15-58

Module/Board Solutions

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Every effort is made to ensure that the information provided in this catalog is accurate. However, please note that no guarantee or legal contract is implied with the presentation of this information. This catalog is intended for informational purposes only, and Moxa reserves the right to update or modify this information at any time.

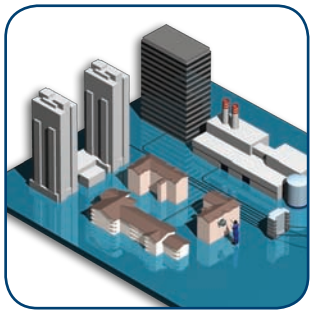
> The latest product information can be found here: www.moxa.com/product

> Send comments or corrections to: twc@moxa.com

Industrial Networking Applications

Power Automation

The field of power automation is composed of the following fundamental systems: power generation, power transmission, and power distribution. For each of these systems, Moxa offers device networking products to facilitate different power automation applications.



Power Substation Automation 1-2
Automatic Meter Reading 1-3
Renewable Energy 1-4

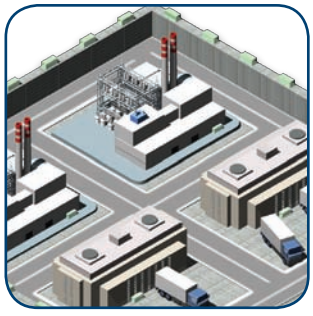
Transportation Automation

Many advanced and cost-effective options are available to improve the efficiency of transportation systems through automation. A wide selection of Moxa products can be used for intelligent transportation system (ITS) applications of almost any size and scope.

Fleet Management 1-5
IP-based Train Control 1-6

Factory Automation

Every manufacturing facility has two essential components: the production line and the facility itself. Moxa offers the right device networking products for automating both production line management and facility monitoring operations.



Production Line Management 1-7

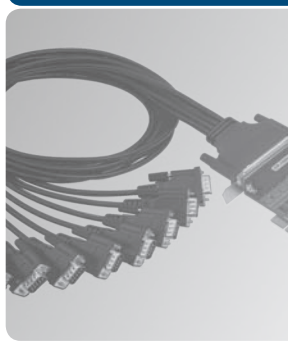
Oil and Gas Automation

Oil and gas production can be divided into three stages: upstream, midstream, and downstream. From drilling to refining, Moxa products can be used to optimize efficiency, productivity, reliability, and safety at any stage of oil and gas production.

Oil Refinery Monitoring 1-8

1

Industrial Networking Applications



Power Substation Automation

Reliability, speed, and real-time response are critical for communication between devices at a power plant or power substation. Use Moxa products to build a truly industrial-grade network backbone that supports real-time monitoring and control.

Products

The **DA-681** embedded computer is a protocol gateway that handles multiple devices running different protocols for front-end data computing and protocol conversion.

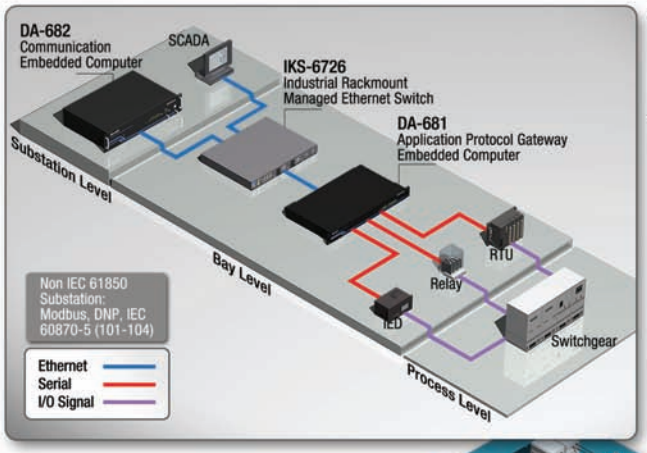
The **DA-682** embedded computer serves as an embedded backbone host and central controller for data analysis, processing, and transmission back to the control center.

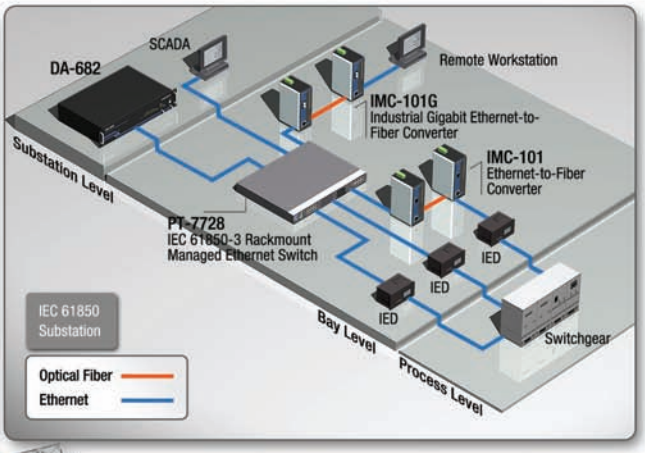
The **IKS-6726** Gigabit modular rackmount Ethernet switch uplinks with the network ring and connects with embedded computers; its industrial, rugged design is ideal for harsh environments.

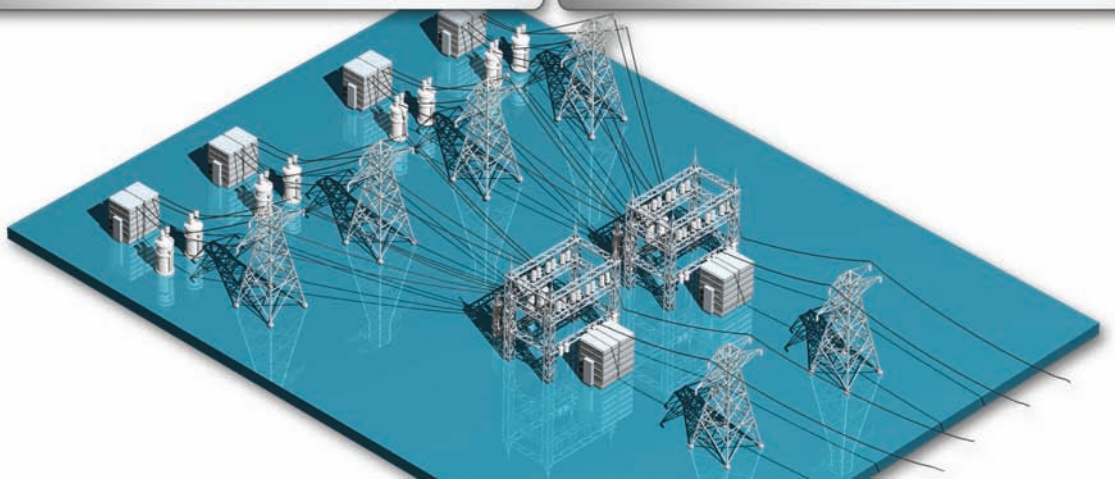
The **PT-7728** Gigabit modular Ethernet switch forms a network ring for redundancy, ensuring superior reliability for complex, high voltage substation environments through IEC 61850-3 and IEEE 1613 compliance.

The **IMC-101** industrial media converters provide industrial grade media conversion between 10/100BaseT(X) and 100BaseFX (SC/ST connectors).

The **IMC-101G** industrial Gigabit media converters provide reliable and stable 10/100/1000BaseSX/LX/LHX/ZX media conversion in harsh industrial environments.







Automatic Meter Reading

A great deal of time and effort is wasted when technicians need to make regular in-person visits to take manual power meter readings. Automated meter reading systems have become an increasingly popular alternative and can be established by using Moxa products to connect power meters to central management workstations.

Products

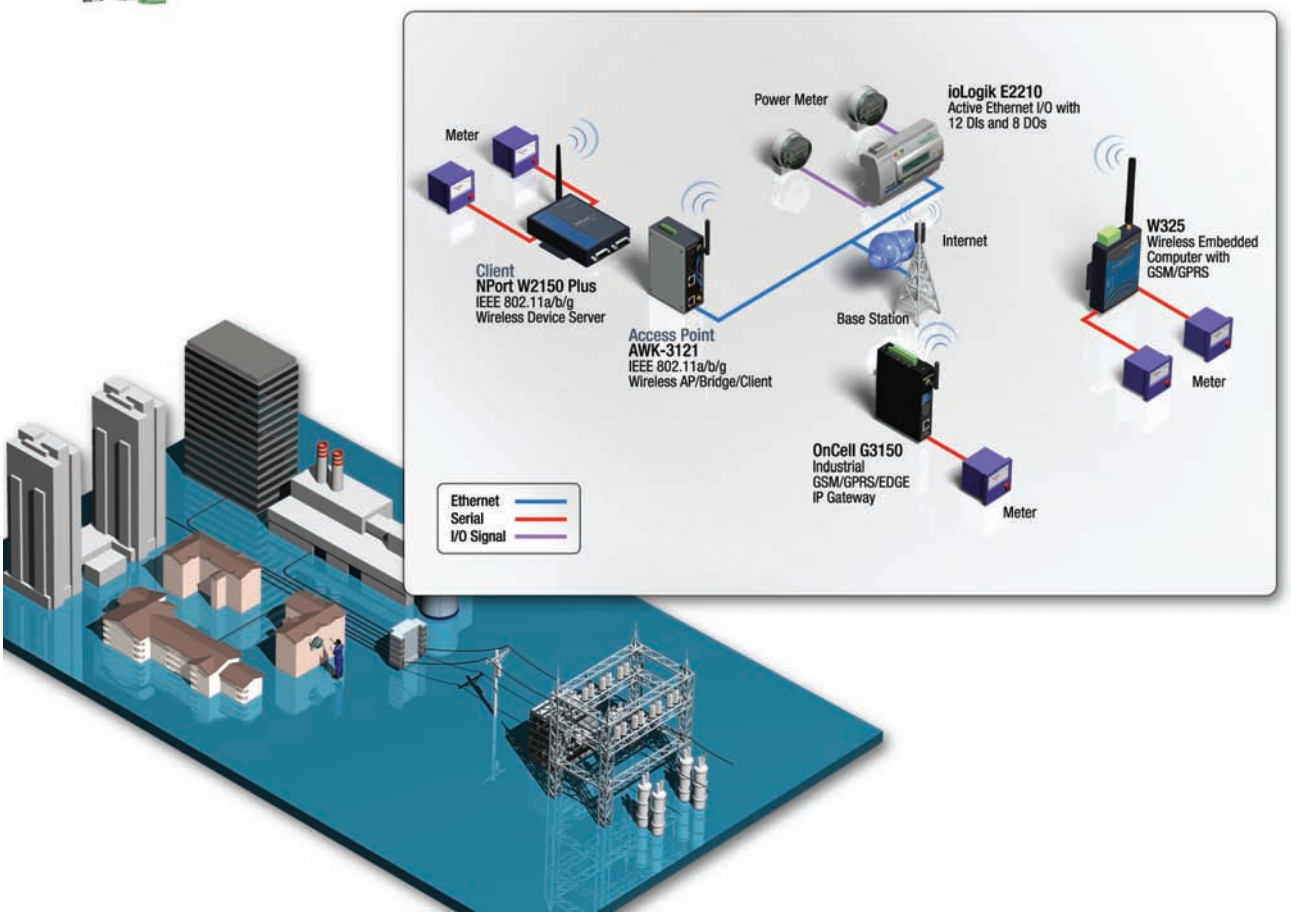
The **W325** embedded computer stores metering data, converts it from proprietary protocols to the standard protocols used by the automation system, performs front-end computing, and then transmits the data to central servers via GSM/GPRS.

The **AWK-3121** provides wireless connection for Ethernet-enabled devices in addition to standard STP/RSTP support for looping protection and redundant communication links.

The **OnCell G3150** cellular IP gateway makes use of high speed wireless GSM/GPRS/EDGE technologies and provides secure TCP/IP connection to your remote power meters over cellular networks.

The **ioLogik E2210** Active Ethernet I/O collects readings from power meters through event-based messaging, allowing system administrators to actively retrieve data for better management.

The **NPort® W2150 Plus** collects data from the power meters over RS-232 or RS-485 connections, and then transmits the encrypted data to central servers over a WiFi network.



Renewable Energy

Rising fuel costs and global warming have led to rapid growth in worldwide demand for renewable energy. In response to the worldwide search for alternative sources of energy, solar power and wind power have emerged as two of the most viable options. Moxa provides a wide range of networking solutions to help harness the power of these invaluable resources.

Products

The **W321** and **UC-7112** embedded computers can be used as front-end controllers that connect to the PV inverter, AI and counter input module, and power meter. They can also be used for remote monitoring, data acquisition, data logging, and protocol conversion.

The **UC-8410** embedded computer is used to control, manage, and remotely monitor the equipment making up a solar power system.

The **V468** and **IA260** embedded computers can serve as the central controller for mapping and tracking the Sun in solar power plants, and sending data back and forth between the tracker and control center.

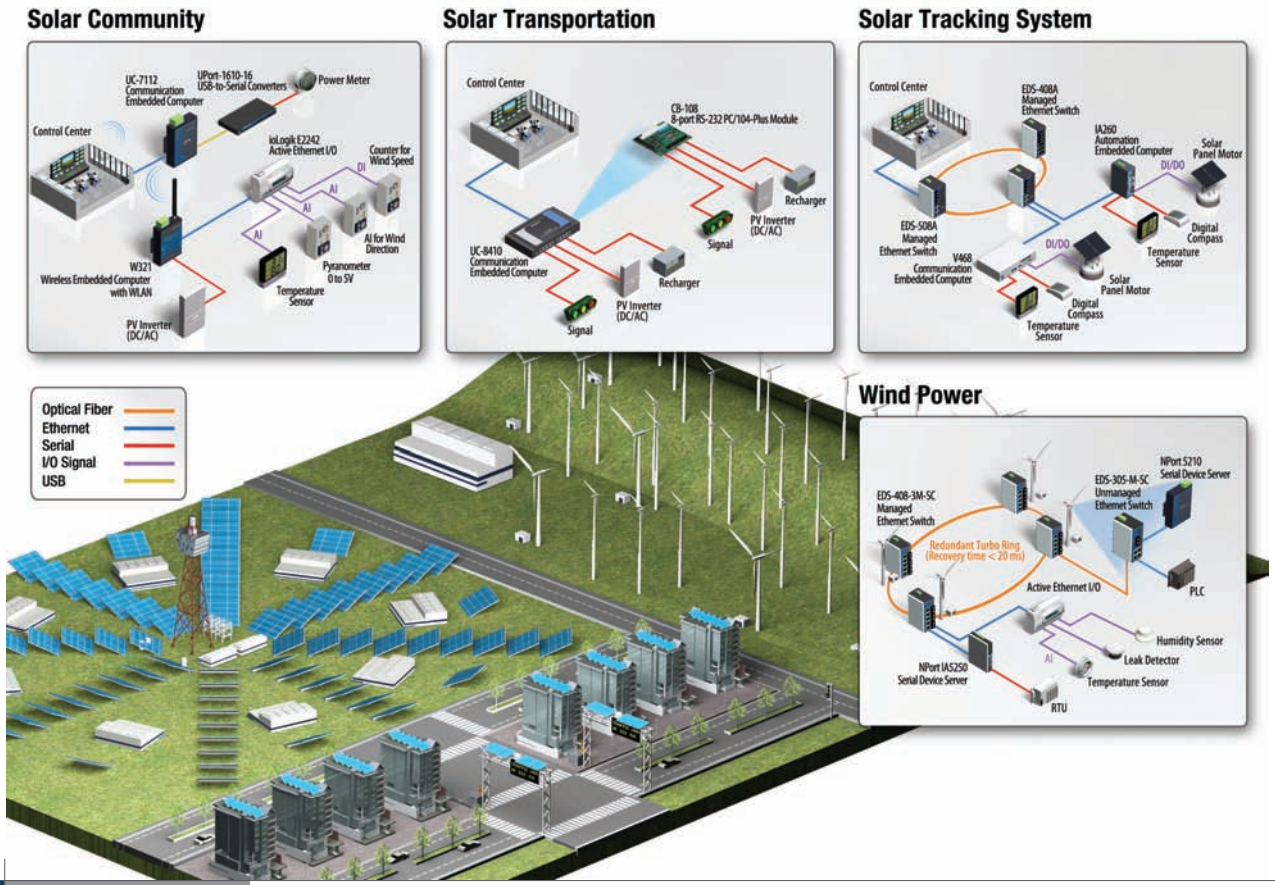
The **EDS-408A** 3-fiber Series Ethernet switches provide network redundancy in the form of a fiber ring topology with super fast recovery time < 20 ms for reliable Ethernet network communication in wind farms.

With Active OPC server, the **ioLogik E2242** Active Ethernet I/O proactively updates event messages to the control center with real-time stamps over the network, effectively integrating it with a real-time SCADA/HMI system.

Moxa's **NPort® 5210** device server can convert industrial serial devices inside a wind turbine into Ethernet devices.

The **UPort™ 1610-16** converters can connect 16 RS-232 devices to your workstation/laptop by USB. With Moxa's own CPU, the **UPort™** 1610 offers USB 2.0 connectivity, 128 bytes FIFO, and HW/SW flow control.

Moxa's **CB-108** connects an industrial PC directly to multiple RS-232 devices. All Moxa's PC/104 and PC/104-Plus modules provide a reliable, high performance solution for serial communication



Fleet Management

Managing large fleets of trucks or buses around the country requires a scalable system that is designed for maximum mobility and efficiency. By taking advantage of Moxa's wide selection of products, a management system can be established to fit nearly any requirement and size.

Products

The **W345** collects data from the onboard GSM/GPRS and transmits the data wirelessly over cellular networks to the control center.

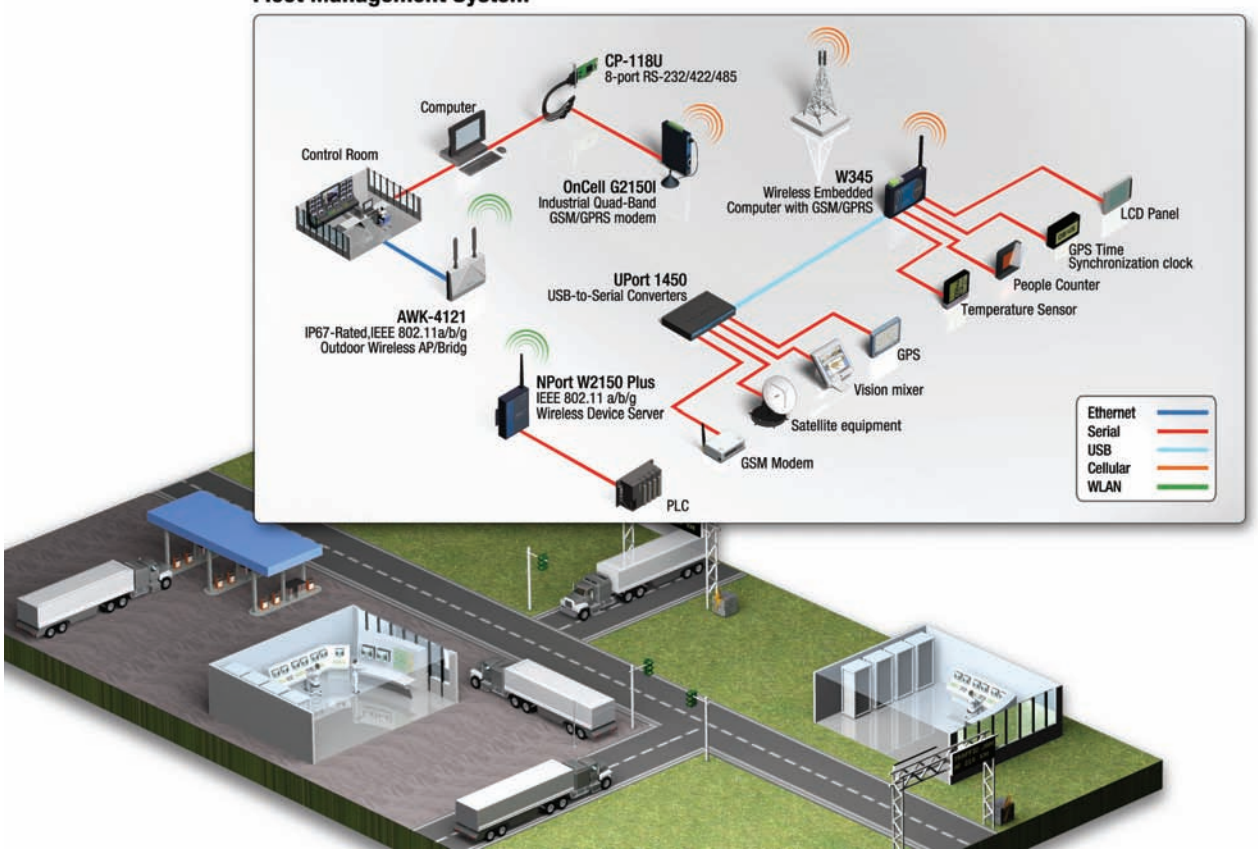
The **NPort® W2150 Plus** allows collected data on the EM-1240 to be transferred wirelessly to the central server when the vehicle is at the station.

The **CP-118U** connects a PC to a large number of devices for station management, including a ticket printer, scanner, vehicle sensor, and modem.

The **UPort™ 1450** connects a laptop and multiple devices for SNG data collection, allowing command centers to gather intelligence and other data with greater mobility.

The **AWK-4121-T** allows information from the vehicle's data collection devices to be downloaded wirelessly when the vehicle arrives in the station.

Fleet Management System



IP-based Train Control

Moxa's industrial Ethernet products, wireless solutions, serial-to-Ethernet device servers, and embedded computers are ideally suited for IP-based train control systems. High port density Ethernet switches and outdoor wireless access points can establish a robust network for rolling stock, along-track, and ground station applications.

Products

The **AWK-4121-T** industrial IEEE 802.11a/b/g outdoor wireless AP/Bridge/Client provides wireless communication capability at speeds up to 100 km/hr with Turbo Roaming under 500 ms.

The **IKS-6726** industrial rackmount Ethernet switch meets EN50155/EN50121-4 certifications, guaranteeing high adaptability and reliable Gigabit speeds for severe conditions including vibrations, shocks, and wide operating temperatures from -40 to 75°C.

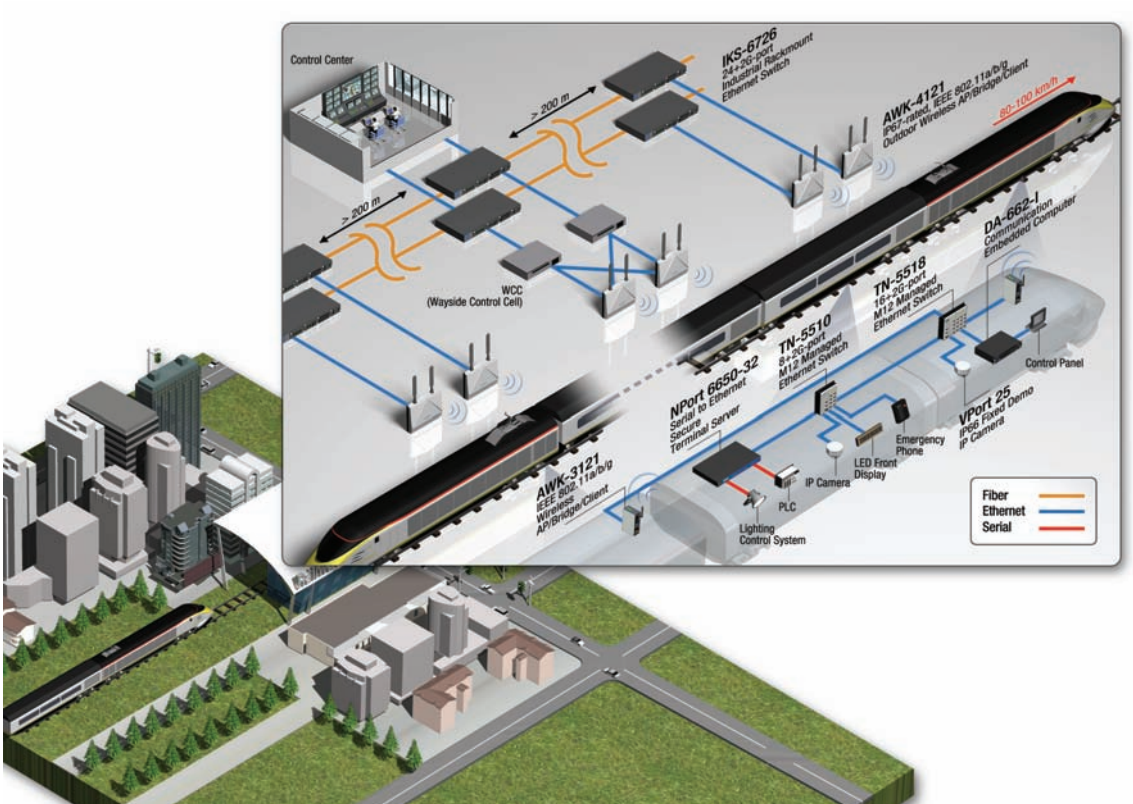
The **NPort® 6650-32** collects data from PLCs via RS-232 or RS-485 connections and then transmits the data to central servers.

The **TN-5500 series** M12 managed Ethernet switches with EN50155/50121-3-2/50121-4 certification are tough enough to withstand critical vibrations and shocks, ensuring robust communication between all Ethernet-enabled devices over a network.

The **DA-662-I** communication embedded computer can be used as an intelligent control platform to handle daily operation aboard trains and ensure reliable performance for rail transport systems.

The **AWK-3121** industrial IEEE 802.11a/b/g wireless Access Point/Bridge/Client can be installed in each car to provide seamless wireless connection to railway stations and control systems.

The **VPort 25** IP camera has a vandal-proof design, IP66 protection, -40 to 50°C operating temperature, and Power-over-Ethernet capability, which is ideal for constructing a secure surveillance system aboard trains.



Production Line Management

By incorporating monitoring devices into a centralized control network, manufacturers can achieve significant gains in productivity. Moxa offers products that directly or wirelessly connect CNCs, robots, AGVs, sensors, PLCs, RTUs, and other devices to management networks.

Products

The **EDS-728** offers up to 4 Gigabit ports, advanced network control, and scalability for a high-performance network backbone.

The **EDS-508A** Ethernet switch forms a redundant Ethernet network with a recovery time under 20 ms, connecting Ethernet devices for non-stop daily operation.

The **VPort 351** video encoders feature wide operating temperature from -40 to 75°C, fiber support, and fanless design for distributed IP surveillance systems.

The **ioLogik E2214** I/O device provides event-driven alarm messaging with real-time stamps, Click&Go configuration, and SNMP support for real-time monitoring and local control of meters and sensors.

The **AWK-3121** and **NPort® W2150 Plus** can connect primary workstations and factory equipment to a wireless network.

The **IA262-I** features DIOs to control conveyer belts, VGA connectors to display and collect scanned data, and is also capable of computing and sending data to the control center.

The **NPort® 6650-32** collects serial data from meters and sensors transmitting the data to central servers.

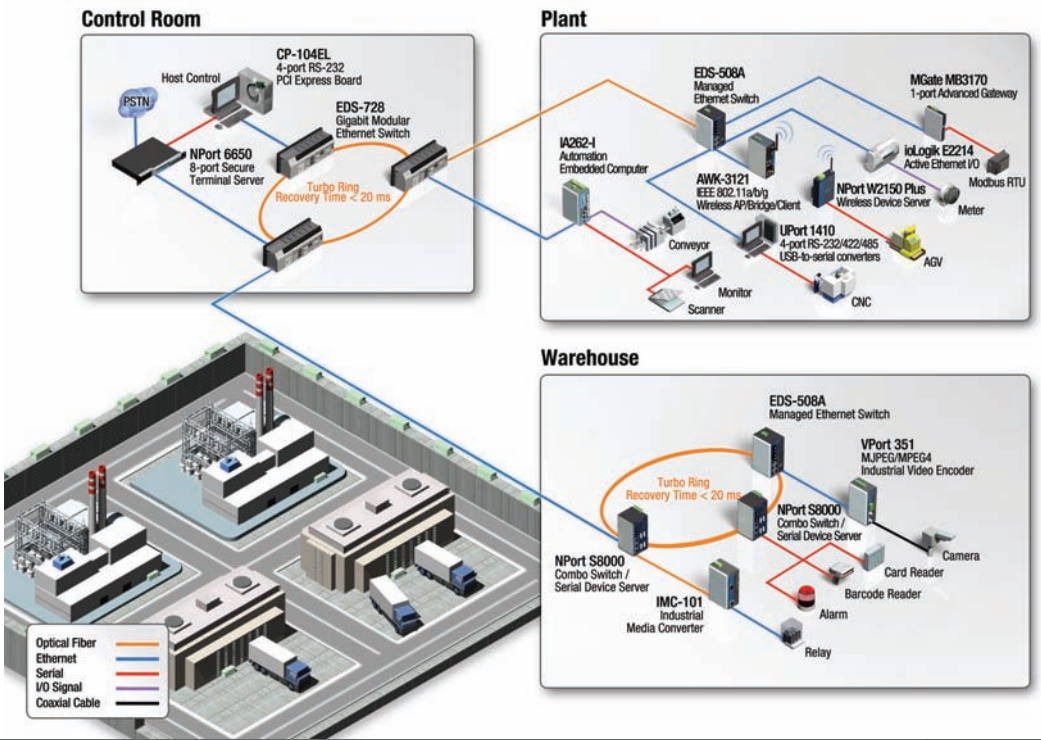
The **CP-104EL** connects an industrial PC directly to multiple PLCs, meters, RTUs, and other monitoring devices.

The **IMC-101** converts 10/100BaseT(X) to 100BaseFX fiber optic connections.

The **NPort® S8455I-MM-SC** integrates 2 fiber ports, 3 Ethernet ports, and 4 RS-232/422/485 serial ports, connecting both Ethernet and serial devices to an Ethernet network for redundancy.

The **MGate MB3170** is designed to integrate Modbus, TCP, ASCII, and RTU devices in almost any master/slave combination.

The **UPort 1410** converters can connect 4 RS-232/422/485 devices to your workstation by USB.



Oil Refinery Monitoring

Distributed Control Systems (DCS) are deployed in complex oil refining processes to connect the entire system of controllers for communication and monitoring. Moxa's industrial networking products, with Class I Division 2 and DNV/GL certifications, extended operating temperature, redundancy technology, and intelligent management features, can develop a hazard-free Ethernet network for non-stop system operation and monitoring in oil refineries.

Products

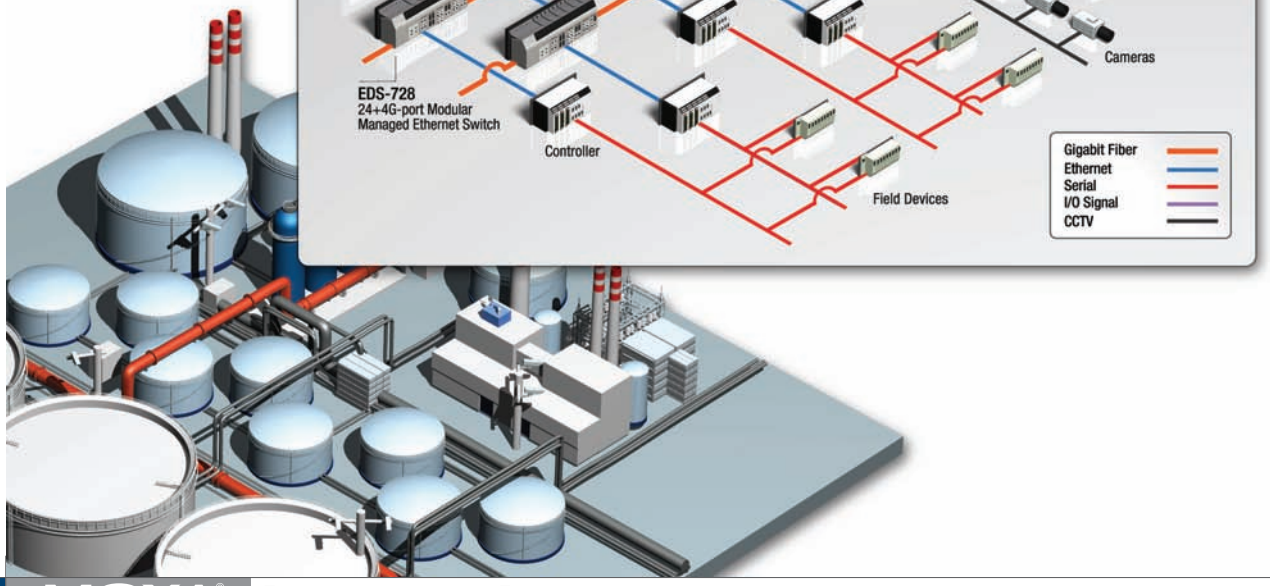
The **EDS-728** modular Gigabit managed Ethernet switch establishes dual redundant Ethernet networks for a DCS that offers media modules flexibility and supports Turbo Ring redundant technology with a recovery time less than 20 ms.

The **EDS-510A** Gigabit managed Ethernet switch is ideal for constructing a redundant fiber-optic Ethernet network with high bandwidth and reliability, thanks to its support for up to 3 Gigabit ports, -40 to 75°C operating temperature, and industrial ratings (Class I Division 2, DNV/GL).

The **VPort 254** industrial video encoder, with -40 to 75°C operating temperature, Class I Division 2 certification, and redundant power inputs, connects analog cameras over a Gigabit network for real-time video streaming and robust surveillance.

The **NPort® IA5000** series industrial serial-to-Ethernet device server connects PLCs, sensors, and other serial-based devices to an Ethernet network and ensures reliable communication due to its industrial rating and wide operating temperature design.

The **ioLogik E2214** Active Ethernet I/O product delivers event-driven reporting with time stamp for precise status updates and real-time alarm management.



New Product Showcase

New Product Showcase

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New Product Showcase

Industrial Ethernet Switches

EDS-608 (page 3-24)

Coming Soon

8-port compact modular managed Ethernet switch

Features

> Modular design lets you choose from a variety of media combinations
> Turbo Ring and RSTP/STP (IEEE 802.1w/D) for Ethernet redundancy
> QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c/v3, RMON supported
> IEEE 802.1X, HTTPS, and SSH to enhance network security
> -40 to 75°C operating temperature (T models)

EDS-G509 Series (page 3-29)

9G-port full Gigabit managed Ethernet switches

Features

> 4 10/100/1000BaseT(X) ports plus 5 combo (10/100/1000BaseT(X) or 100/1000BaseSFP slot) Gigabit ports
> Fiber optic options for extending distance and improving electrical noise immunity
> Turbo Ring, RSTP/STP (IEEE 802.1w/D) for Ethernet redundancy
> QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c/v3, RMON supported
> IEEE 802.1X, HTTPS, and SSH enhance network security

EDS-P510 Series (page 3-40)

7+3G-port Gigabit PoE managed Ethernet switches

Features

> 4 IEEE 802.3af-compliant PoE and Ethernet combo ports
> Provides up to 15.4 watts at 48 VDC per PoE port
> Intelligent power consumption detection, classification, and PoE scheduling function
> 3 combo (10/100/1000BaseT(X) or 100/1000BaseSFP slot) Gigabit ports; 2 ports for redundant ring and 1 port for uplink
> Turbo Ring (recovery time < 20 ms), RSTP/STP (IEEE 802.1w/D) for Ethernet redundancy

IKS-6726 Series (page 3-14)

24+2G-port Gigabit modular managed Ethernet switches

Features

> Meets UL 60950-1, NEMA TS2, EN50155/EN50121-4, and DNV/GL certifications
> Turbo Ring and RSTP/STP for Ethernet redundancy
> Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply
> Modular design lets you choose from a variety of media combinations
> -40 to 75°C operating temperature range

EDS-G205/G308 Series (page 3-57)

5G and 8G-port full Gigabit unmanaged Ethernet switches

Features

> Fiber optic options for extending distance and electrical noise immunity (EDS-G308)
> Redundant dual 12/24/48 VDC power inputs
> Relay output warning for power failure and port break alarm
> Broadcast storm protection
> -40 to 75°C operating temperature range (T models)

EDS-205A/208A Series (page 3-62)

5 and 8-port unmanaged Ethernet switches

Features

> 10/100BaseT(X) (RJ45 connector), 100BaseFX (multi/single-mode, SC or ST connector)
> Redundant dual 12/24/48 VDC, 18 to 30 VAC power inputs
> IP30 aluminum housing
> Rugged hardware design well-suited for hazardous locations (Class I Div. 2 / Zone 2) and marine environments (DNV/GL/ABS/LR/NKK)
> -40 to 75°C operating temperature range (T models)

Industry-specific Ethernet Switches

TN-5508/5510/5516/5518 Series (page 4-7)

Coming Soon

8, 8+2G, 16, 16+2G-port M12 managed Ethernet switches

Features

> M12 connectors for robust links
> Wide power input range from 12 to 110 VDC (LV-MV model)
> Isolated redundant power inputs with universal 12/24/36/48 VDC, 72/96/110 VDC, or 110/220 VDC/VAC power supply range
> 2-port flexibility of Gigabit Ethernet ports with relay bypass function
> EN50155/50121-3-2/50121-4, NEMA TS2, and e1 compliant
> -40 to 75°C operating temperature range (T models)

TN-5308 Series (page 4-10)

Coming Soon

8-port M12 unmanaged Ethernet switches

Features

> Universal 12/24/36/48 or 72/96/110 VDC power supply range
> M12 connectors and IP40 metal housing
> Supports IEEE 802.3/802.3u/802.3x
> EN50155/50121-3-2/50121-4, NEMA TS2, and e1 compliant
> -40 to 75°C operating temperature range (T models)

PT-7828 Series (page 4-20)

IEC 61850-3 24+4G-port Layer 3 Gigabit modular managed rackmount Ethernet switches

Features

> Layer 3 routing to interconnect multiple LAN segments
> IEC 61850-3, IEEE 1613 (power substations), NEMA TS2 (traffic control systems), and EN50121-4 (railway applications) compliant
> Turbo Ring and RSTP/STP for Ethernet redundancy
> Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
> Modular design for various media options: RJ45, fiber optic, M12, and SFP ports
> -40 to 85°C operating temperature range

PT-7710 Series (page 4-26)

IEC 61850-3 8+2G-port Gigabit modular managed rackmount Ethernet switches

Features

> IEC 61850-3, IEEE 1613 (power substations), NEMA TS2 (traffic control systems), and EN50121-4 (railway applications) compliant
> Turbo Ring and RSTP/STP for Ethernet redundancy
> Universal power supply range, 12/24/48 VDC or 110/220 VDC/VAC
> Modular design lets you choose from a variety of media combinations
> -40 to 85°C operating temperature range

Industrial I/O

Active OPC Server Lite (page 5-11)

Seamlessly connect ioLogik to your SCADA system

Features

> OPC DA 3.0 supported
> Event-driven tag update:
  - Save 80% on network bandwidth
  - I/O response that's 7 times faster
> Patented automatic tag generation
> Firewall-friendly connection from remote ioLogik devices
  - Allows remote I/O to use dynamic IP
  - Allows remote I/O to use private IP
> Download free from Moxa's website

Click&Go (page 5-13)

Easy and intuitive I/O control configuration for ioLogik Active Ethernet I/O

Features

> PC-free solution with local intelligence
> Programming-free IF-THEN-ELSE logic reduces setup time
> Time stamped active alarm reports with TCP, UDP, SNMP Trap, email, SMS, or CGI commands
> Time-based scheduler and timer control
> Input-to-output control over IP with peer-to-peer and remote action

ioLogik E2242 (page 5-19)

Active Ethernet I/O with 4 analog inputs and 12 configurable DIOs

Features

> 4 fixed differential analog input channels
> 12 configurable digital input/output channels
> DI counter saved automatically when power shuts off
> Instant event messaging by TCP/UDP/email/SNMP-Trap
> PC-based configuration utility and web console
> Easy-to-use Click&Go™ Logic for local output control
> Windows/WinCE VB/VC.NET and Linux C APIs
> I/O control over Modbus/TCP and SNMP protocol
> NIST traceable calibration

ioMirror E3210 (page 5-22)

Ethernet Peer-to-Peer I/O with 8 digital inputs and 8 digital outputs

Features

> Direct input-to-output signal communication over IP
> High speed Peer-to-Peer I/O within 20 ms
> One physical alarm port for connectivity status
> Quick and easy utility and web-based settings
> Local alarm channel and remote alarm messaging
> Supports Modbus/TCP for remote monitoring
> Optional LCD module for convenient configuration

ioLogik E4200 (page 5-24)

Modular Active Ethernet I/O adaptor

Features

> Supports up to 16 I/O modules
> Dual Ethernet LANs and one RS-232 port
> Front-end intelligence that supports 80 Click&Go rules
> Unicode Active Messaging with real-time stamp, including SMS, SNMP Trap with I/O status, TCP, email
> Built-in web console
> PC utility: Auto detection of installed modules
> Windows/WinCE VB/VC.NET and Linux C APIs

ioLogik W5340 (page 5-27)

Active GPRS I/O with 4 AIs, 8 DIOs, and 2 relay outputs

Features

> GPRS, Ethernet LAN, RS-232/422/485 supported
> Smart Active GPRS connection
> Low power consumption
> Secure wake on call ID
> Active messaging with real-time stamp
> SNMP Trap with I/O status
> Data logging with SD card
> Unicode Active Messaging with real-time stamp, including SMS, SNMP Trap with I/O status, TCP, email
> ioAdmin and Active OPC Server supported
> Windows/WinCE VB/VC.NET and Linux C APIs

Video Networking Products

VPort 354 Series (page 6-7)

Coming Soon

Full motion, 4-channel MJPEG/MPEG4 industrial video encoders

Features

> Industrial design with -40 to 75°C operating temperature and fiber optic Ethernet port
> 2 Ethernet ports for cascade and port redundancy
> SD card slot for local storage capability
> Modbus/TCP supported for easy communication with SCADA software
> Video stream up to 120 frames/sec at 4CIF (704 x 480) resolution

VPort 351 Series (page 6-13)

Full motion, 1-channel MJPEG/MPEG4 industrial video encoder

Features

> Industrial design with -40 to 75°C operating temperature and fiber optic Ethernet port
> Video stream up to 30 frames/sec at full D1 (720 x 480) resolution
> Pre/post-alarm video recording function for advanced surveillance
> 2-way (1-in/1-out) audio supported
> Free VPort SDK PLUS and 4-channel video surveillance software

VPort 251 (page 6-20)

Full motion, 1-channel MJPEG/MPEG4 video encoder

Features

> Compress analog video/audio signals into MJPEG/MPEG4 video streams
> Video stream up to 30 frames/sec at full D1 (720 x 480) resolution
> 2-way (1-in/1-out) audio supported
> Transparent PTZ control for using legacy PTZ control panel or keyboard
> Loop-through power output for powering an analog camera

VPort D351 (page 6-22)

1-channel MJPEG/MPEG4 industrial video decoder

Features

> Decode MJPEG and MPEG4 video streams to an analog video signal automatically
> Manual selection or automatic scan with maximum of 64 video sources
> 2-way (1-in/1-out) audio supported
> Transparent PTZ control with legacy PTZ controller
> SNMP for network management

VPort 25 Series (page 6-24)

IP66, day-and-night vandal-proof fixed dome IP camera for outdoors

Features

> -40 to 50°C operating temperature; heater or fan not required
> IP66-rated for protection from rain and dust
> Direct-wired power input and PoE for power redundancy
> Up to 30 frames/sec at 720 x 480 resolution
> One camera lens for both day and night use

SoftNVR (page 6-27)

Expandable IP surveillance software for managing up to 64 video channels

Features

> Multi-screen viewing format (maximum of 64 channels)
> Dual monitor capability
> Video analytics and instant response
> Video quality enhancement tools
> Intelligent and convenient video search

Terminal Servers

CN2600 Series (page 7-24)

8 and 16-port RS-232/422/485 terminal servers with LAN redundancy

Features

> LCD panel for easy IP address configuration
> Dual-LAN cards with two independent MAC addresses and IP addresses
> Redundant COM function available when both LANs are active
> Dual-host redundancy can be used to add a backup PC to your system
> Dual AC power inputs
> Real COM/TTY drivers for Windows and UNIX

Serial Device Servers

NPort S8000 Series (page 8-16)

Combo switch / serial device server

Features

> Configurable serial data transmission priority
> 5-port managed Ethernet switch built in
> Ethernet redundancy with Turbo Ring® (recovery time < 20 ms) or RSTP/STP (IEEE 802.1w/D)
> QoS, IGMP-snooping/GMRP, VLAN, LACP, SNMPv1/v2c/v3, RMON supported
> 4-port RS-232/422/RS-485 serial device server
> 2 KV (DC) isolation protection for each serial port
> Surge protection for serial, power, and Ethernet
> 15 KV ESD surge protection for all serial signals
> Adjustable pull high/low resistor and terminator for RS-485 ports

NPort 5600 Desktop Series (page 8-35)

8-port RS-232/422/485 serial device servers

Features

> 8 serial ports supporting RS-232/422/485
> Compact desktop design
> 10/100M auto-detecting Ethernet
> Built-in 15 KV ESD protection for all serial signals
> Easy IP address configuration with LCD panel
> Choice of configuration methods: Web console, Telnet console, and Windows utility
> Versatile socket operation modes, including TCP Server, TCP Client, UDP, and Real COM
> SNMP MIB-II for network management
> Built-in recorder: Use your own voice as the alert when exceptions occur

MiiNePort E1 Series (page 8-42)

Coming Soon

10/100 Mbps embedded serial device servers

Features

> Same size as an RJ45 connector—only 33.9 x 16.25 x 13.5 mm
> Extremely low power consumption—only 600 mW @ 3.3 VDC input
> Uses the MiiNe, Moxa's second generation SoC
> NetEz technology makes integration incredibly easy
> Versatile choice of operation modes: Real COM, RFC2217, TCP Server, TCP Client, UDP, and Modem

WE-2100T Series (page 8-49)

Wireless LAN embedded serial device servers

Features

> Connects serial devices to IEEE 802.11a/b/g networks
> Choice of operation modes: Real COM, TCP Server, TCP Client, UDP, and RFC2217
> Windows (including Vista) Real COM and Linux fixed TTY drivers provided
> Wireless security with WEP, WPA, and WPA2
> Select any baudrate between 50 bps and 921.6 Kbps
> 9 programmable digital I/O channels
> SSL/SSH encryption for configuration
> Compact size and easy to mount housing

Ethernet Fieldbus Gateways

MGate™ MB3170/3270 (page 9-8)

1 and 2-port advanced serial-to-Ethernet Modbus gateways

Features

> Configuration is exceptionally easy
> Slave mode supports 16 TCP masters and up to 62 serial slaves at the same time
> Master mode supports 32 TCP slaves at the same time
> Emergency request tunnels ensure QoS control
> Serial redirector function provided
> Embedded Modbus protocol analyzer
> Redundant dual DC power inputs
> Built-in Ethernet cascading for easy wiring

MGate EIP3000 (page 9-13)

1 and 2-port DF1 to Ethernet/IP gateways

Features

> Supports PCCC objects for Rockwell Automation networks
> Supports 8 simultaneous Ethernet/IP clients with up to 16 simultaneous requests per client
> Serial redirector function provided
> Remote serial port for multiple DF1 device communication
> Embedded Ethernet/IP and DF1protocol analyzer
> Redundant dual DC power inputs
> Built-in Ethernet cascading for easy wiring

Multiport Serial Boards

CP-102E/EL (page 10-26)

2-port RS-232 PCI Express boards

Features

> PCI Express x1 compliant
> 921.6 Kbps maximum baudrate for super fast data transmission
> 128-byte FIFO and on-chip H/W, S/W flow control
> Low profile form factor fits small-sized PCs
> Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64), Linux 2.4/2.6, QNX 6, Windows XP Embedded, SCO OpenServer 5/6, UnixWare 7
> 15 KV ESD protection on the board

CP-132EL/EL-I (page 10-28)

2-port RS-422/485 PCI Express boards with optional 2 KV isolation

Features

> PCI Express x1 compliant
> 921.6 Kbps maximum baudrate for super fast data transmission
> 128-byte FIFO and on-chip H/W, S/W flow control
> Low profile form factor fits small-sized PCs
> Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64), Linux 2.4/2.6, QNX 6, Windows XP Embedded, SCO OpenServer 5/6, UnixWare 7
> 15 KV ESD protection on the board

CP-112UL/112UL-I Series (page 10-52)

2-port RS-232/422/485 Universal PCI serial boards with optional 2 KV isolation

Features

> Over 700 Kbps data throughput for top performance
> 128-byte FIFO and on-chip H/W, S/W flow control
> Universal PCI compatible with 3.3/5 V PCI and PCI-X
> Serial communication speed up to 921.6 Kbps
> Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64), Windows CE 5.0/6.0, Windows XP Embedded, Linux 2.4/2.6, SCO OpenServer 5/6, UnixWare 7
> Easy maintenance with on-board LED display
> On-board 15 KV ESD and 2 KV optical isolation protection
> Wide temperature model available for -40 to 85°C environments

CP-114EL/EL-I (page 10-22)

4-port RS-232/422/485 PCI Express boards with optional 2 KV isolation

Features

> PCI Express x1 compliant
> 921.6 Kbps maximum baudrate for super fast data transmission
> 128-byte FIFO and on-chip H/W, S/W flow control
> Low profile form factor fits small-sized PCs
> Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64), Linux 2.4/2.6, QNX 6, Windows XP Embedded, SCO OpenServer 5/6, UnixWare 7
> 15 KV ESD protection on the board

CP-114UL/114UL-I (page 10-46)

4-port RS-232/422/485 Universal PCI serial board with optional 2 KV isolation

Features

> Over 700 Kbps data throughput for top performance
> 128-byte FIFO and on-chip H/W, S/W flow control
> Universal PCI compatible with 3.3/5 V PCI and PCI-X
> Serial communication speed up to 921.6 Kbps
> Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4/2.6, FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7
> Easy maintenance with on-board LED display
> On-board 15 KV ESD and 2 KV optical isolation protection
> Wide temperature model available for -40 to 85°C environments

CP-102UF Series (page 10-60)

2-port Universal PCI serial over fiber boards

Features

> Extend serial transmission distance up to:
  - 40 km with single mode—CP-102UF-S-ST
  - 5 km with multi-mode—CP-102UF-M-ST
> Supports “Ring” and “Point-to-Point” transmission modes
> 921.6 Kbps maximum baudrate for super fast data transmission
> 128-byte FIFO and on-chip H/W, S/W flow control
> Compatible with 3.3/5 V PCI and PCI-X
> Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64), Windows XP Embedded, Windows CE 5.0/6.0, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 6, SCO OpenServer 5/6, UnixWare 7
> Easy maintenance with on-board LED display and management software
> Immune from signal interference
> Guards against electronic degradation and chemical corrosion
> Wide temperature model available for -40 to 85°C environments

USB Connectivity

UPort™ 2210/2410 (page 11-23)

2 and 4-port RS-232 USB-to-serial converters

Features

> Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
> 921.6 Kbps maximum baudrate for super fast data transmission
> Additional I/O and IRQ not needed
> Built-in 15 KV ESD protection for all serial ports
> Certified drivers provided for Windows (including Vista) and Linux
> Supports Fixed-Base COM Utility for setting the initial COM port number
> LEDs for easy monitoring

UPort™ 2230/2430 (pages 11-25)

2 and 4-port RS-422/485 USB-to-serial converters

Features

> Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
> 921.6 Kbps maximum baudrate for super fast data transmission
> Additional I/O and IRQ not needed
> Built-in 15 KV ESD protection for all serial ports
> Certified drivers provided for Windows (including Vista) and Linux
> Supports Fixed-Base COM Utility for setting the initial COM number
> LEDs for easy monitoring

UPort™ 404/407 (page11-27)

4 and 7-port industrial-grade USB hubs

Features

> Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
> USB-IF certification
> Dual power supply (power jack and terminal block)
> 15 KV ESD Level 4 protection for all USB ports
> Rugged metal housing
> DIN-Rail and wall mountable
> Comprehensive diagnostic LEDs
> Choose bus power or external power (UPort™ 404)

UPort™ 204/207 (page 11-29)

4 and 7-port entry-level USB hubs

Features

> Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
> USB-IF Certification
> Compatible with USB 1.1 devices
> 15 KV ESD Level 4 protection for all USB ports
> Wall mountable
> Comprehensive diagnostic LEDs
> Full 500 mA of power per port
> Choose bus power or external power (UPort™ 204 only)

Media Converters

TRC-190 Series (page 12-7)

Rackmount chassis for the NRack System

Features

> 19-inch chassis for rackmount use
> 19 slots for high density applications
> Supports hot-swap and dual power input with redundancy
> Fan-less chassis design reduces repair time

TCF-142-RM Series (page 12-9)

RS-232/422/485 to fiber slide-in modules for the NRack System

Features

> Extend RS-232/422/485 transmission up to:
  - 40 km with single mode
  - 5 km with multi-mode
> 1K or 150K ohm adjustable pull high/low resistor
> "Ring" and "Point-to-Point" transmission supported

ICF-1150 Series (page 12-11)

Industrial serial-to-fiber converters

Features

> RS-232, fiber, and RS-422/485 3-way communication
> Rotary switch to change the pull high/low resistor value
> Extend RS-232/422/485 transmission up to:
  - 40 km with single-mode
  - 5 km with multi-mode
> 3-way Galvanic Isolation (for "I" model only)
> -40 to 85°C wide temperature models available
> Class I, Div. II certification (Pending)

TCF-142 Series (page 12-14)

RS-232/422/485 to optical fiber media converters

Features

> "Ring" and "Point-to-Point" transmission
> Extends RS-232/422/485 transmission up to:
  - 40 km with single-mode—TCF-142-S
  - 5 km with multi-mode—TCF-142-M
> Compact size
> Decreases signal interference
> Protects against electrical interference and chemical corrosion
> Supports baudrates of 50 bps to 921.6 Kbps
> Wide temperature models available (-40 to 75°C)

TCF-90 Series (page 12-17)

Port-powered RS-232 to optical fiber media converters

Features

> Use either external power or power over serial
> Extends RS-232 transmission up to:
  - 40 km with single-mode—TCF-90-S
  - 5 km with multi-mode—TCF-90-M
> Reduces signal interference
> Protects against electrical interference or chemical corrosion
> 15 KV ESD protection for serial signals
> Baudrates up to 115.2 Kbps
> Compact size

TCF-100/100I Series (page 12-19)

Industrial RS-232 to RS-422/485 converters with optional 2 KV isolation

Features

> RS-232 to RS-422 conversion with RTS/CTS support
> RS-232 to 2-wire or 4-wire RS-485 conversion
> 2 KV isolation protection (TCC-100I)
> Wall and DIN-rail mounting
> Plug-in terminal block for easy RS-422/485 wiring
> LED indicators for power, Tx, Rx
> -20 to 60°C operating temperature
> Wide temperature model available (-40 to 85°C)

WLAN & Cellular Solutions

AWK-4222 Series (page 13-16)

Coming Soon

Industrial IEEE 802.11a/b/g outdoor dual-RF AP/Bridge/Client

Features

> IEEE 802.11a/b/g compliant
> Redundant power inputs and PoE
> Higher security with WEP/WPA/WPA2/802.11X and powerful filters
> Turbo Roaming™ for seamless wireless connections
> Dual-RF design for redundant wireless communication
> Wide operating temperature range and IP67-rated metal housing for hazardous environments

AWK-3222 Series (page 13-20)

Coming Soon

Industrial IEEE 802.11a/b/g dual-RF AP/Bridge/Client

Features

> IEEE 802.11a/b/g compliant
> Redundant power inputs and PoE
> Higher security with WEP/WPA/WPA2/802.11X and powerful filters
> Turbo Roaming™ for seamless wireless connections
> Dual-RF design for redundant wireless communication

OnCell 5004/5104-HSDPA (page 13-34)

Coming Soon

Industrial tri-band UMTS/HSDPA high speed cellular routers

Features

> Universal tri-band UMTS/HSDPA 850/900/2100 MHz
> Industrial primary and backup wireless WAN connectivity
> Connect up to 4 10/100BaseT(X) devices
> Redundant DC power inputs
> 2 digital inputs and 1 relay output (OnCell 5104-HSDPA only)

OnCell G3110/3150-HSDPA (page 13-38)

Industrial tri-band UMTS/HSDPA IP gateways

Features

> Universal tri-band UMTS/HSDPA 850/900/2100 MHz
> Bring 10/100Base-T and serial devices together
> Choice of operation modes, including TCP Server, TCP Client, UDP, Real COM, Reverse Real COM, and RFC2217
> Secure modes for TCP Server, TCP Client, Real COM, and Reverse Real COM
> Redundant DC power inputs
> Two digital inputs and 1 relay output
> Centralize private IP management software
> DIN-Rail mounting

AWK-4121 Series (page 13-18)

Industrial IEEE 802.11a/b/g outdoor wireless AP/Bridge/Client

Features

> IEEE 802.11a/b/g compliant
> Redundant power inputs and PoE
> Higher security with WEP/WPA/WPA2/802.11X and powerful filters
> Turbo Roaming™ for seamless wireless connections
> Long-distance communication support
> Wide operating temperature range and IP67-rated metal housing for hazardous environments

AWK-3121 Series (page 13-22)

Industrial IEEE 802.11a/b/g wireless AP/Bridge/Client

Features

> IEEE 802.11a/b/g compliant
> Power input by redundant 24 VDC power inputs or Power-over-Ethernet
> Powerful security with WPA/WPA2/802.11X filters
> Turbo Roaming™ for seamless wireless connection
> Long-distance communication support
> STP/RSTP support to increase reliability
> DIN-Rail or wall mounting ability
> IP30 protected high-strength metal housing
> -40 to 75°C operating temperature range (T models)

OnCell 5004/5104 (page 13-36)

Coming Soon

Industrial quad-band GSM/GPRS cellular routers

Features

> Universal quad-band GSM/GPRS 850/900/1800/1900 MHz
> Industrial primary and backup wireless WAN connectivity
> Connect up to 4 10/100BaseT(X) devices
> Redundant DC power inputs
> 2 digital inputs and 1 relay output (OnCell 5104 only)

OnCell G3110/3150 (page 13-40)

Industrial quad-band GSM/ GPRS/EDGE IP gateways

Features

> Connect both Ethernet and serial devices to cellular networks
> Universal quad-band GSM/GPRS/EDGE-850/900/1800/1900 MHz
> Choice of operation modes, including TCP Server, TCP Client, UDP, Real COM, and RFC2217
> Secure modes for TCP Server, TCP Client, and Real COM
> Redundant DC power input
> 2 digital inputs and 1 relay output
> Centralize private IP management software
> DIN-Rail mounting

OnCell G3111/3151/3211/3251 (page 13-42) Coming Soon

1 and 2-port RS-232 or RS-232/422/485 cellular IP modems

Features

> Universal quad-band GSM/GPRS 850/900/1800/1900 MHz
> Choice of operation modes, including TCP Server, TCP Client, UDP, Real COM, and Reverse Real COM
> Management software: private IP management with OnCell Central
> Choice of configuration methods, including web console, serial console, and Telnet
> Desktop or DIN-Rail installation

NPort® W2150/2250 Plus (page 13-26)

1 and 2-port RS-232/422/485 IEEE 802.11a/b/g wireless device servers

Features

> Link any serial device to an IEEE 802.11a/b/g network
> 921.6 Kbps baudrate for RS-232/422/485 transmissions
> Web-based configuration using built-in Ethernet or WLAN
> Enhanced remote configuration with HTTPS, SSH
> Secure data access with WEP, WPA, WPA2
> Built-in WLAN site survey tool
> Wireless roaming with user-defined signal strength threshold
> Off-line port buffering and serial data log
> Dual power inputs (1 power jack, 1 terminal block)

Embedded Computers for Communication

V462 Series (page 15-8)

x86-based computers with 4 serial ports, dual LANs, VGA, CompactFlash, PCMCIA, USB

Features

> AMD Geode LX 800@0.9W CPU, 500 MHz
> Built-in 256 MB (CE) or 512 MB (XPe) DDR SDRAM
> Built-in 256 MB (CE) or 1 GB (XPe) industrial DOM to store the operating system
> 256 KB of SRAM with battery backup
> Dual 10/100 Mbps Ethernet ports for network redundancy
> 4 USB 2.0 hosts supporting system boot up
> LED indicators for power, battery, storage
> Ready-to-run WinCE 6.0 or Windows XP Embedded platform
> -40 to 75°C wide temperature model available

V464 Series (page 15-11)

x86-based computers with 4 serial ports, quad LANs, VGA, CompactFlash, USB

Features

> AMD Geode LX 800@0.9W CPU, 500 MHz
> Built-in 256 MB (CE) or 512 MB (XPe) DDR SDRAM
> Built-in 256 MB (CE) or 1 GB (XPe) industrial DOM to store the operating system
> 256 KB of SRAM with battery backup
> Quad 10/100 Mbps Ethernet ports for network redundancy
> LED indicators for power, battery, storage
> Ready-to-run WinCE 6.0 or Windows XP Embedded platform
> -40 to 75°C wide temperature model available

V466 Series (page 15-14)

x86-based computers with 4 serial ports, quad LANs, VGA, CompactFlash, built-in 8-port Ethernet switch, USB

Features

> AMD Geode LX 800@0.9W CPU, 500 MHz
> Built-in 256 MB (CE) or 512 MB (XPe) DDR SDRAM
> Built-in 256 MB (CE) or 1 GB (XPe) industrial DOM to store the operating system
> 256 KB battery backup SRAM
> Quad 10/100 Mbps Ethernet ports for network redundancy
> Built-in 8-port Ethernet switch for connecting network devices
> 4 USB 2.0 hosts supporting system boot up
> LED indicators for power, battery, storage
> Ready-to-run WinCE 6.0 or Windows XP Embedded platform
> Robust, fan-less design
> -40 to 75°C wide temperature model available

V468 Series (page 15-17)

x86-based computers with 4 serial ports, quad LANs, VGA, 8 DIs, 8 DOs, CompactFlash, USB

Features

> AMD Geode LX 800@0.9W CPU, 500 MHz
> Built-in 256 MB (CE) or 512 MB (XPe) DDR SDRAM
> Built-in 256 MB (CE) or 1 GB (XPe) industrial DOM to store the operating system
> 256 KB battery backup SRAM
> Quad 10/100 Mbps Ethernet ports for network redundancy
> 8 DI and 8 DO interfaces for digital input/output connections, with 3 KV isolation protection
> 4 USB 2.0 hosts supporting system boot up
> LED indicators for power, battery, storage
> Ready-to-run WinCE 6.0 or Windows XP Embedded platform
> -40 to 75°C wide temperature model available

UC-8410 Series (page 15-23)

RISC-based industrial embedded computers with 8 serial ports, 3 LANs, DIO, 2 CAN ports, CompactFlash, USB

Features

> Intel XScale IXP435 533 MHz processor
> 256 MB DDR2 SDRAM and 16 MB Flash ROM onboard
> 32 MB NAND Flash for data storage
> 8 RS-232/422/485 serial ports
> 4 digital input and 4 digital output channels
> 3 10/100 Mbps Ethernet ports
> 2 USB 2.0 hosts for mass storage devices
> Ready-to-run Linux platform
> Robust, fanless design
> Wide temperature model available

UC-8416 Series (page 15-26)

RISC-based industrial embedded computers with 8 serial ports, 3 LANs, DIO, 8 built-in Ethernet switch ports, CompactFlash, USB

Features

> Intel XScale IXP435 533 MHz processor
> 256 MB DDR2 SDRAM and 16 MB Flash ROM onboard
> 32 MB NAND Flash for data storage
> 8 RS-232/422/485 serial ports
> 8 Ethernet switch ports
> 4 digital input and 4 digital output channels
> 3 10/100 Mbps Ethernet ports
> 2 USB 2.0 hosts for mass storage devices
> Ready-to-run Linux platform
> -40 to 75°C wide temperature model available

UC-8418 Series (page 15-29)

RISC-based industrial embedded computers with 8 serial ports, 3 LANs, DIO, 2 CAN ports, CompactFlash, USB

Features

> Intel XScale IXP435 533 MHz processor
> 256 MB DDR2 SDRAM and 16 MB Flash ROM onboard
> 32 MB NAND Flash for data storage
> 8 RS-232/422/485 serial ports
> 2 CANbus ports
> 12 digital input and 12 digital output channels
> 3 10/100 Mbps Ethernet ports
> 2 USB 2.0 hosts for mass storage devices
> Ready-to-run Linux platform
> Robust, fanless design
> -40 to 75°C wide temperature model available

DA-682 Series (page 15-52)

x86-based rackmount computers with VGA, 4 Gigabit Ethernet ports, 2 peripheral expansion slots, CompactFlash, USB

Features

> Intel Celeron M 1 GHz processor with 400 MHz FSB
> Built-in DDR2 SDRAM and industrial flash disk module
> Quad Gigabit Ethernet ports for network redundancy
> Software selectable RS-232/422/485 with 2 KV isolation protection
> PCI expansion slots for inserting expansion modules
> 1 CompactFlash socket for storage expansion
> USB 2.0 ports for high speed peripherals, supporting system bootup
> 19-inch rackmount, 2U high form factor
> 100/240 VAC/VDC power inputs
> Ready-to-Run Linux, WinCE 6.0, or Windows XP Embedded platform
> Fanless design

DA-681 Series (page 15-49)

x86-based rackmount embedded computer with 4 isolated RS-232 and 8 isolated RS-485 ports, 6 LANs, VGA, CompactFlash, USB

Features

> Intel Celeron M 1 GHz processor with 400 MHz FSB
> 1 x 200-pin DDR2 SODIMM socket, supporting DDR2 400 up to 1 GB
> 6 10/100 Mbps Ethernet ports
> 1 CompactFlash socket, 1 IDE and serial ATA-150 connectors for storage expansion
> USB 2.0 ports for high speed peripherals
> Serial port speed from 50 to 921.6 Kbps, supporting nonstandard baudrates
> Embedded Linux, WinCE 6.0, or WinXPe platform
> 19-inch rackmount model, 1U high
> Dual 100/240 VAC/VDC power input (DP/PP version)
> Fanless Design

Embedded Computers for Automation

IA260 Series (page 16-3)

RISC-based computers with 4 serial ports, dual LANs, VGA, DIO, CompactFlash, USB

Features

> Cirrus Logic EP9315 ARM9 CPU, 200 MHz
> 128 MB RAM on-board, 32 MB flash disk
> 4 software-selectable RS-232/422/485 serial ports
> VGA interface for field site monitoring
> Dual 10/100 Mbps Ethernet for network redundancy
> 8+8 DI/DO channels, up to 30 VDC12 to 48 VDC power input design
> Supports CompactFlash and USB 2.0 hosts
> Ready-to-run Linux or WinCE 6.0 platform
> H-type heat dissipation design for system reliability
> -40 to 75°C wide operating temperature model available

IA-261-I/262-I Series (page 16-6)

RISC-based computers with 2 or 4 digitally isolated serial ports, dual LANs, VGA, CAN, DIO, CompactFlash, USB

Features

> Cirrus Logic EP9315 ARM9 CPU, 200 MHz
> 128 MB RAM on-board, 32 MB flash disk
> VGA interface for field site monitoring
> 2 KV digitally isolated RS-232/422/485 serial ports
> Dual 10/100 Mbps Ethernet for network redundancy
> Dual 2 KV digitally isolated CAN ports with CANopen protocol support
> 8+8 DI/DO with 3 KV optical isolation protection
> 12 to 48 VDC redundant power input design
> Supports CompactFlash and USB 2.0 hosts
> Ready-to-run Linux or WinCE 6.0 platform
> -40 to 75°C wide temperature models available

Industrial Ethernet Switches

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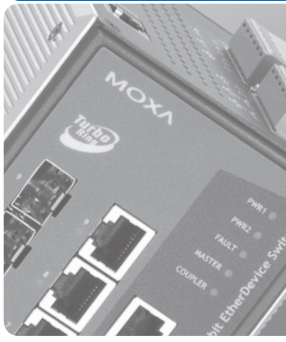
3

Industrial Ethernet Switches



Managed Ethernet Switches

	Managed Rackmount Switches		Managed DIN-Rail Switches					
	IKS-6726	IKS-6726-PoE	EDS-828	EDS-728	EDS-608	EDS-G509	EDS-518A	EDS-510A
Supported Modules								
Gigabit Ethernet Modules	√	√	√	√	---	---	---	---
Fast Ethernet Modules	√	√	√	√	√	---	---	---
SFP Gigabit Ethernet Modules	√	√	√	√	---	√	√	√
SFP Fast Ethernet Modules	√	√	---	---	---	√	---	---
Number of Ports								
Max. Number of Ports	26	26	28	28	8	9	18	10
Gigabit Ethernet, 10/100/1000 Mbps	up to 2	up to 2	up to 4	up to 4	---	9	2	3
Fast Ethernet, 10/100 Mbps	up to 24	up to 24	up to 24	up to 24	8	---	16	7
Available Power Supplies								
3.3 VDC	---	---	---	---	---	---	---	---
24 VDC	√	√	√	√	---	---	√	√
24 VAC	---	---	---	---	---	---	---	---
48 VDC	√	√	---	---	---	---	---	---
12/24/48 VDC	---	---	---	---	√	√	---	---
88-300 VDC or 85-264 VAC, isolated	√	√	---	---	---	---	---	---
Installation Options								
DIN-Rail Mounting	---	---	√	√	√	√	√	√
Panel Mounting	---	---	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Rack Mounting	√	√	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Supported Operating Temperatures								
0 to 60°C	---	---	√	√	√	√	√	√
-10 to 60°C	---	---	---	---	---	---	---	---
-40 to 75°C	√	√	---	---	√	√	√	√
Redundancy and Backup Options								
Turbo Ring (Recovery Time < 20 ms)	√	√	√	√	√	√	√	√
STP/RSTP	√	√	√	√	√	√	√	√
Automatic Backup Configurator (ABC-01)	√	√	√	√	√	√	√	√
Network Management and Control								
Layer 3 Switching	---	---	√	---	---	---	---	---
IPv6	√	√	---	√	√	√	√	√
DHCP Option 66/67/82	√	√	√	√	√	√	√	√
IEEE 1588 PTP	√	√	√	√	√	√	√	√
LLDP	√	√	√	√	√	√	√	√
Modbus/TCP	√	√	√	√	√	√	√	√
IGMP/GMRP	√	√	√	√	√	√	√	√
Port Trunking	√	√	√	√	√	√	√	√
IEEE 802.1X	√	√	√	√	√	√	√	√
Port Lock	√	√	√	√	√	√	√	√
SNMP/RMON	√	√	√	√	√	√	√	√
VLAN	√	√	√	√	√	√	√	√
QoS	√	√	√	√	√	√	√	√
Relay Warning	√	√	√	√	√	√	√	√
Regulatory Approvals								
CE/FCC	√	√	√	√	√	√	√	√
UL/cUL 60950-1	Pending	Pending	Pending	Pending	---	---	√	√
UL508	---	---	Pending	Pending	Pending	Pending	√	√
UL/cUL Class I, Div. 2; ATEX Class I, Zone 2	---	---	Pending	Pending	Pending	Pending	Pending	√
DNV/GL	Pending	Pending	Pending	Pending	Pending	Pending	√	√
NEMA TS2	√	√	---	---	---	---	---	---
EN50155/EN50121-4	√	√	---	---	---	---	---	---

Managed Ethernet Switches

	Managed DIN-Rail Switches						
	EDS-505A	EDS-508A	EDS-516A	EDS-405A	EDS-408A	EDS-P510	EOM-104
Supported Modules							
Gigabit Ethernet Modules	---	---	---	---	---	---	---
Fast Ethernet Modules	---	---	---	---	---	---	---
SFP Gigabit Ethernet Modules	---	---	---	---	---	√	---
SFP Fast Ethernet Modules	---	---	---	---	---	√	---
Number of Ports							
Max. Number of Ports	5	8	16	5	8	10	4
Gigabit Ethernet, 10/100/1000 Mbps	---	---	---	---	---	3	---
Fast Ethernet, 10/100 Mbps	5	8	16	5	8	7 (4 PoE)	4
Available Power Supplies							
3.3 VDC	---	---	---	---	---	---	√
24 VDC	√	√	√	√	√	---	---
24 VAC	---	---	---	---	---	---	---
48 VDC	---	---	---	---	---	√	---
12/24/48 VDC	---	---	---	---	---	---	---
88-300 VDC or 85-264 VAC, isolated	---	---	---	---	---	---	---
Installation Options							
DIN-Rail Mounting	√	√	√	√	√	√	---
Panel Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	---
Rack Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	---
Supported Operating Temperatures							
0 to 60°C	√	√	√	√	√	√	---
-10 to 60°C	---	---	---	---	---	---	---
-40 to 75°C	√	√	√	√	√	√	√
Redundancy and Backup Options							
Turbo Ring (Recovery Time < 20 ms)	√	√	√	√	√	√	√
STP/RSTP	√	√	√	√	√	√	√
Automatic Backup Configurator (ABC-01)	√	√	√	√	√	√	---
Network Management and Control							
Layer 3 Switching	---	---	---	---	---	---	---
IPv6	√	√	√	√	√	√	---
DHCP Option 66/67/82	√	√	√	√	√	√	---
IEEE 1588 PTP	√	√	√	---	---	√	---
LLDP	√	√	√	√	√	√	---
Modbus/TCP	√	√	√	√	√	√	---
IGMP/GMRP	√	√	√	---	---	√	---
Port Trunking	√	√	√	---	---	√	---
IEEE 802.1X	√	√	√	---	---	√	---
Port Lock	√	√	√	---	---	√	---
SNMP/RMON	√	√	√	√	√	√	√
VLAN	√	√	√	√	√	√	---
QoS	√	√	√	√	√	√	---
Relay Warning	√	√	√	√	√	√	---
Regulatory Approvals							
CE/FCC	√	√	√	√	√	√	√
UL/cUL 60950-1	√	√	√	√	√	---	---
UL508	√	√	√	√	√	Pending	---
UL/cUL Class I, Div. 2; ATEX Class I, Zone 2	√	√	Pending	√	√	Pending	---
DNV/GL	√	√	√	√	√	Pending	---
NEMA TS2	---	---	---	---	---	---	---
EN50155/EN50121-4	---	---	---	---	---	---	---

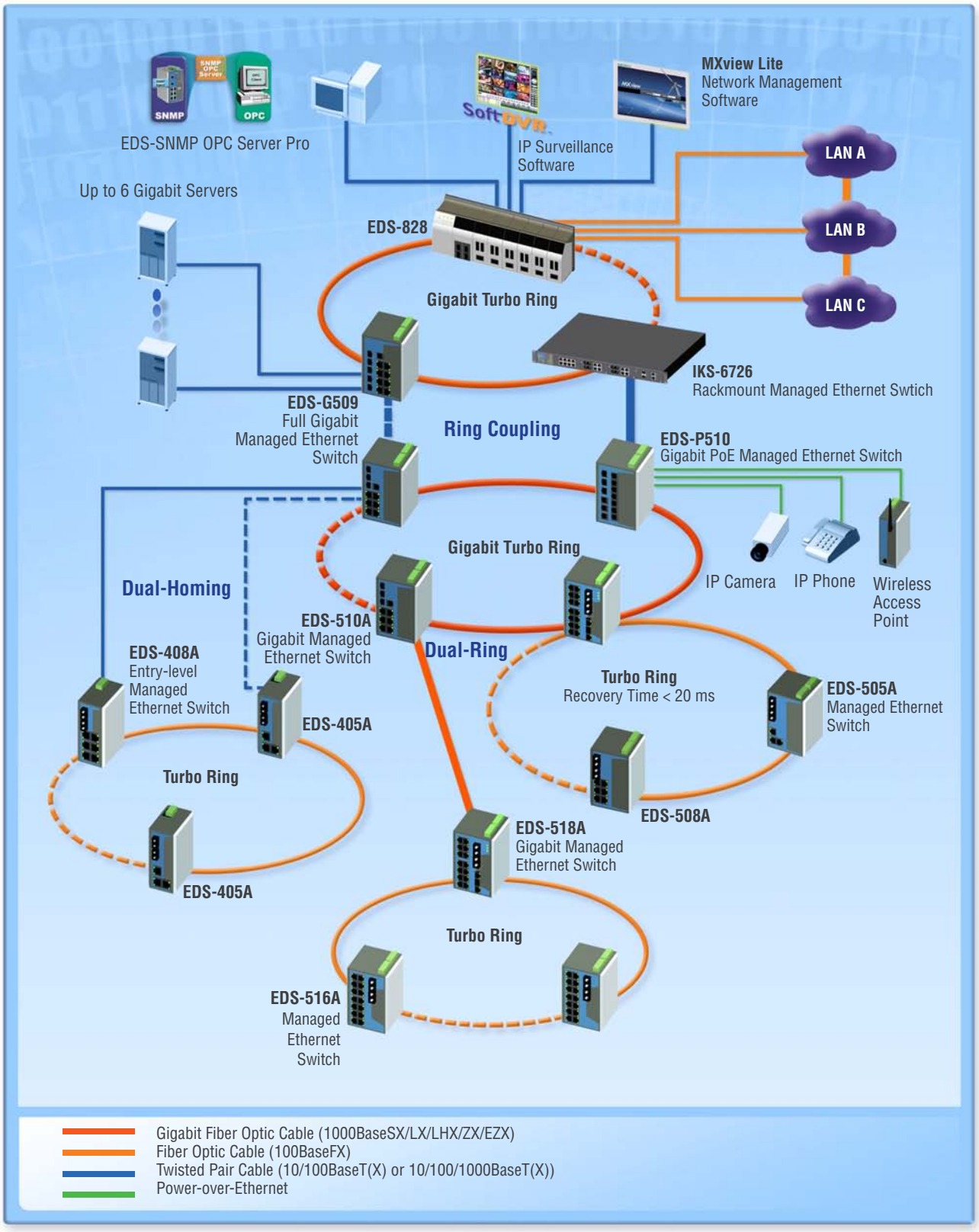
Unmanaged Ethernet Switches

	Unmanaged Rackmount Switches	Unmanaged DIN-Rail Switches					
	IKS-6324	EDS-G205	EDS-G308	EDS-305	EDS-308	EDS-309	EDS-316
Supported Modules							
Gigabit Ethernet Modules	√	---	---	---	---	---	---
Fast Ethernet Modules	√	---	---	---	---	---	---
SFP Gigabit Ethernet Modules	√	---	√	---	---	---	---
SFP Fast Ethernet Modules	---	---	√	---	---	---	---
Number of Ports							
Max. Number of Ports	24	5	8	5	8	9	16
Gigabit Ethernet, 10/100/1000 Mbps	Up to 2	5	8	---	---	---	---
Fast Ethernet, 10/100 Mbps	Up to 24	---	---	5	8	9	16
Available Power Supplies							
24 VDC	---	---	---	√	√	√	√
24 VAC	---	---	---	---	---	---	---
48 VDC	---	---	---	---	---	---	---
12/24/48 VDC	√	√	√	---	---	---	---
88-300 VDC or 85-264 VAC, isolated	√	---	---	---	---	---	---
Installation Options							
DIN-Rail Mounting	---	√	√	√	√	√	√
Panel Mounting	---	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Rack Mounting	√	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Supported Operating Temperatures							
0 to 60°C	---	√	√	√	√	√	√
-10 to 60°C	---	---	---	---	---	---	---
-40 to 75°C	√	√	√	√	√	√	√
Regulatory Approvals							
CE/FCC	√	√	√	√	√	√	√
UL/cUL 60950-1	Pending	---	---	√	√	√	√
UL508	---	Pending	Pending	√	√	√	√
UL/cUL Class I, Div. 2; ATEX Class I, Zone 2	---	Pending	Pending	√	√	√	Pending
DNV/GL	Pending	Pending	Pending	√	√	√	√
NEMA TS2	√	---	---	---	---	---	---
EN50155/EN50121-4	√	---	---	---	---	---	---

Unmanaged Ethernet Switches

	Unmanaged DIN-Rail Switches				
	EDS-205A	EDS-208A	EDS-205	EDS-208	EDS-P308
Supported Modules					
Gigabit Ethernet Modules	---	---	---	---	---
Fast Ethernet Modules	---	---	---	---	---
SFP Gigabit Ethernet Modules	---	---	---	---	---
SFP Fast Ethernet Modules	---	---	---	---	---
Number of Ports					
Max. Number of Ports	5	8	5	8	8
Gigabit Ethernet, 10/100/1000 Mbps	---	---	---	---	---
Fast Ethernet, 10/100 Mbps	5	8	5	8	8 (4 PoE)
Available Power Supplies					
24 VDC	---	---	√	√	---
24 VAC	√	√	√	√	---
48 VDC	---	---	---	---	√
12/24/48 VDC	√	√	---	---	---
88-300 VDC or 85-264 VAC, isolated	---	---	---	---	---
Installation Options					
DIN-Rail Mounting	√	√	√	√	√
Panel Mounting	w/ optional kit	w/ optional kit	---	---	w/ optional kit
Rack Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Supported Operating Temperatures					
0 to 60°C	---	---	---	---	√
-10 to 60°C	√	√	√	√	---
-40 to 75°C	√	√	---	---	√
Regulatory Approvals					
CE/FCC	√	√	√	√	√
UL/cUL 60950-1	---	---	---	√	---
UL508	√	√	√	√	√
UL/cUL Class I, Div. 2; ATEX Class I, Zone 2	Pending	Pending	---	---	Pending
DNV/GL	Pending	Pending	---	---	Pending
NEMA TS2	---	---	---	---	---
EN50155/EN50121-4	---	---	---	---	---

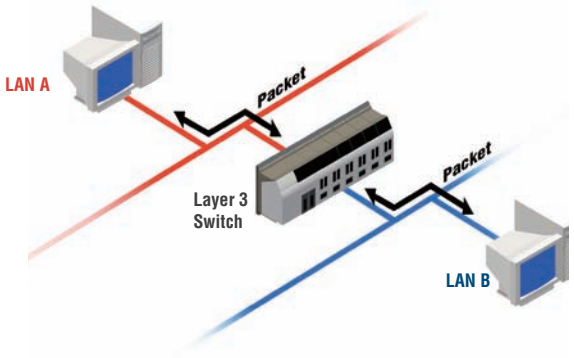
Introduction to Managed Ethernet Switches



Intelligent Layer 3 Network Control

What is a Layer 3 Switch?

Layer 3 switches use the IP address to make switching decisions, just like a router, but use hardware optimized to transmit data just as fast as Layer 2 switches. The 802.1Q VLAN of a Layer 2 switch allows network operators to configure and maintain their network more effectively, but cross VLAN communication still relies on traditional Layer 3 routers. Both routers and Layer 3 switches use a routing protocol and routing table to determine the best path. However, compared to routers, which are usually software-based, Layer 3 switches are relatively faster and less expensive. This is due to their built-in switching hardware with optimized chips and full-wire speed IP frame forwarding performance suitable for interconnecting VLANs. Moxa's Layer 3 switches can be used to partition a large-scale LAN into multiple subnets for better network performance.



Static Routing

Instead of using MAC tables in the way that Layer 2 Ethernet switches them, the EDS-828 has a built-in IP routing table to support the forwarding of IP frames. Network administrators need to configure and maintain this IP routing table manually, and if changes are made to the network topology, the network administrator will need to reconfigure the routing table.

Routing Information Protocol (RIP)

In addition to static routing, the EDS-828 has a built-in IP routing table that can be set up and updated dynamically by RIP (routing information protocol). RIP is an often used routing protocol that relies on the Bellman-Ford algorithm and "hop count" measurement to determine how packets should be routed from one network to another.

Open Shortest Path First (OSPF)

The EDS-828 also supports OSPF (open shortest path first), which uses "Link State" instead of "hop count" to determine the network route. OSPF is more complicated than RIP. However, compared to RIP, OSPF has faster network convergence and results in less network traffic. Both RIP and OSPF are usually referred to as Interior Gateway Protocols (IGP).

Distance Vector Multicast Routing Protocol (DVMRP)

The EDS-828 supports Distance Vector Multicast Routing Protocol (DVMRP), which is used to share information between routers to transport IP multicast packets between networks. DVMRP resembles RIP, but is extended for multicast delivery to forward packets. The router generates a routing table with the multicast group for which it knows the corresponding distances. When a multicast packet is received by a router, it is forwarded by the routing interfaces specified in the routing table.

Protocol Independent Multicast—Dense Mode (PIM-DM)

The EDS-828 supports the Protocol Independent Multicast—Dense Mode (PIM-DM), which is designed mainly for multicast LAN applications with high bandwidth. PIM-DM is optimized to guarantee delivery of multicast packets so as not to reduce overhead. The PIM-DM multicast routing protocol assumes that all downstream routers would like to receive multicast messages, and relies upon explicit pruning messages from downstream routers to remove branches from the multicast delivery tree that do not contain multicast group members. PIM-DM is an efficient protocol since most receivers are interested in the multicast data, but does not scale well across larger domains in which most receivers are not interested in the data.

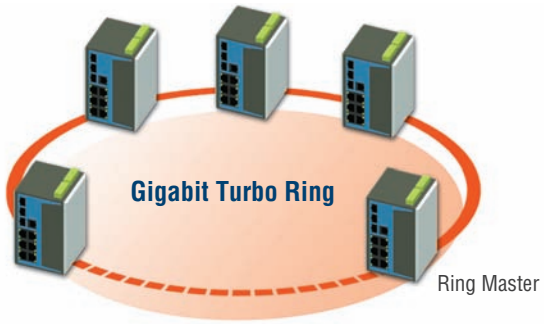
Static versus Dynamic

The EDS-828's built-in IP routing table can be updated and maintained both statically and dynamically. If the network is small and fixed, the network administrator may decide to configure the IP routing table manually. However, any change in the network topology will require the network administrator to reconfigure the settings manually. If the network is extended or the network topology is changed frequently, using dynamic routing provides an efficient way to enhance network stability and reduce the time it takes to effect network convergence. Dynamic routing protocol allows devices to detect and respond to network changes automatically. In this case, network administrators do not need to reconfigure the settings after the network changes.

Advanced Layer 2 Network Management

Gigabit Ethernet Redundant Ring

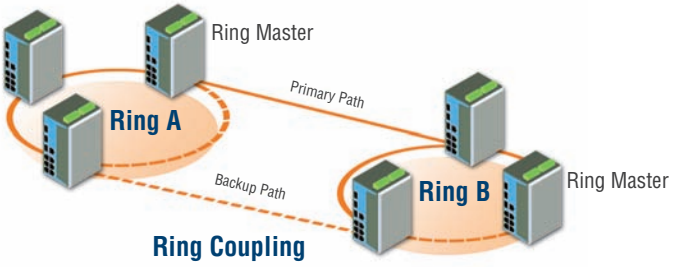
Ethernet is becoming the default data communication medium for industrial automation applications. In fact, it's not uncommon for video, voice, and high-rate industrial application data transfers to be integrated into one network. Moxa's EDS-G509, EDS-510A/518A, EDS-P510, and IKS-6726, which come equipped with a redundant Gigabit Ethernet protocol called Gigabit Turbo Ring, gives system maintainers a convenient means of setting up a versatile yet stable Gigabit Ethernet network. With Gigabit Turbo Ring, if any segment of the network is disconnected, your automation system will be back to normal in few milliseconds.

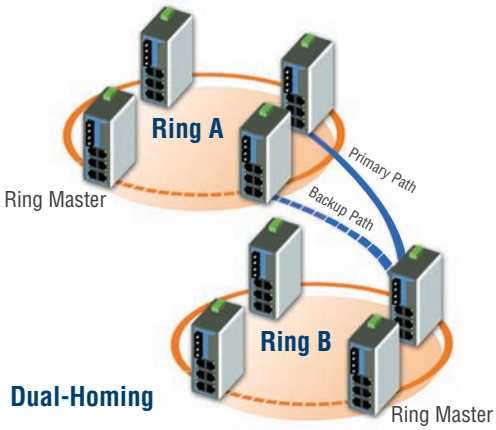


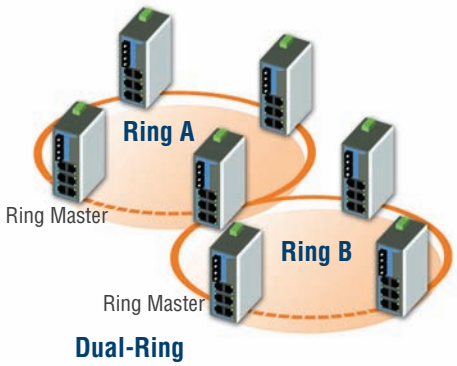
Coupling Several Turbo Rings for Distributed Applications

For some systems, it may not be convenient to connect all devices in the system to create one BIG redundant ring, since some devices could be located at a remote site. Turbo Ring's "Ring Coupling" function helps you separate those distributed devices into different smaller redundant rings, without any control line, but in such a way that the smaller rings will still be able to communicate with each other.

The advanced coupling technology allows you to diversify the connection to Turbo Ring and fit various installation environments. You can configure the network for "Dual-Homing," which involves coupling two separate rings with a single Moxa managed Ethernet switch connecting to two independent connection points. The back-up path will be activated if the operating connection (primary path) fails, and the "Dual-Ring" function adds reliability by allowing a single Moxa managed Ethernet switch to connect two separate rings for applications that present cabling difficulties.

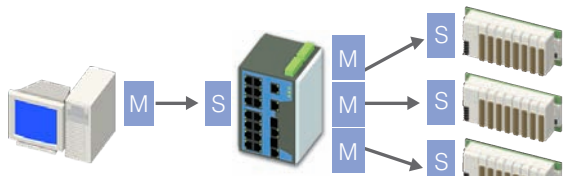






IEEE 1588 PTP Enhances Time Synchronization

IEEE 1588, also known as Precision Time Protocol (PTP), is designed to synchronize real-time clocks located at the nodes of a distributed system that communicates over a network. Moxa's managed Ethernet switches (not including the EDS-400A) are well suited for applications, such as motion control, that require distributed clocks to be synchronized with high accuracy.



Grandmaster Clock: Determines the time base for the system

Boundary Clock: Slave to the grandmaster clock and master to its slave

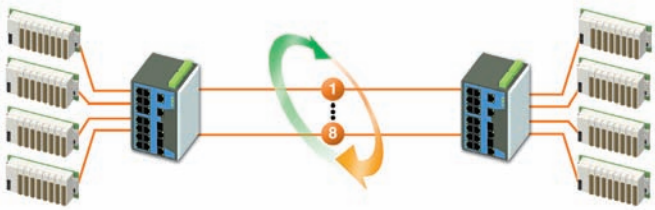
Ordinary Clock: Slave to its master

IPv6 for Next Generation Networking

IPv6 is the next generation protocol for Internet networking. Since IPv4 addresses will be completely used up in the near future, support for IPv6 (128-bit IP addresses) is important to secure the future of your network. Moxa's managed Ethernet switches support IPv6 to offer better addressing and security for large networks, and to protect your future investments.

Port Trunking for Flexible Network Connections

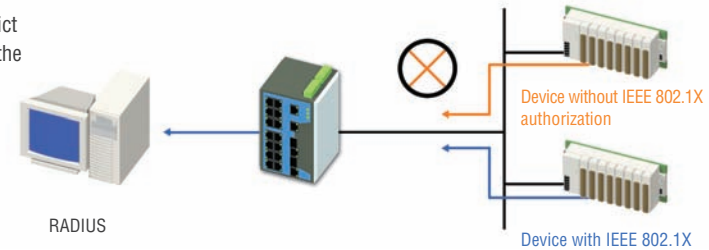
IEEE 802.3ad (LACP, Link Aggregation Control Protocol) provides flexible network connections and a redundant path for critical devices. For example, the EDS-G509 and EDS-500A allow users to set up a wider communication path by aggregating a trunk group. A maximum of eight ports can be assigned to one trunk group to optimize your network connection and redundant paths. When selected ports are grouped for trunking, LACP will exchange information to determine whether or not the ports selected in a group can be trunked together.



Up to 8 ports can be assigned to one trunk group

IEEE 802.1X Enhances User Authentication

Moxa's managed Ethernet switches (not including the EDS-400A) support IEEE 802.1X (Port-based Network Access Control) to restrict port access to authorized users only. Authentication is done using the local user database or an external RADIUS (Remote Authentication Dial In User Service) server.



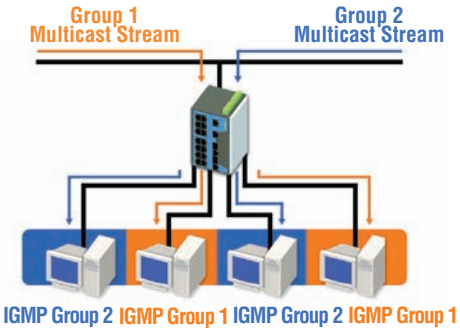
HTTPS and SSH Enhance Network Security

In order to protect data from being intercepted, Moxa's managed Ethernet switches (not including the EDS-400A) support the HTTPS and SSH protocols for transferring data over the Internet in an encrypted form. If you are changing the configuration of an Ethernet switch online, be sure to use HTTPS and SSH to keep your data secure.

HTTPS/SSH

IGMP Snooping and GMRP for Filtering Multicast Traffic

Moxa's managed Ethernet switches (not including the EDS-400A) support IEEE 802.1D-1998 GMRP (GARP Multicast Registration Protocol) and IGMP snooping, which provide the ability to prune multicast traffic so that it travels only to those end destinations that require this kind of traffic. The overall effect is to reduce the amount of traffic on the Ethernet LAN.

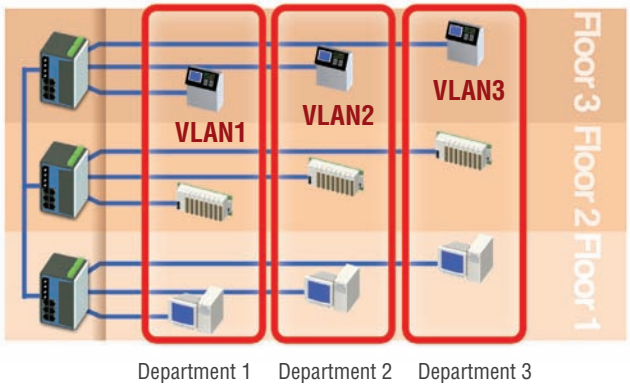


RMON for Efficient Network Monitoring and Proactive Capability

RMON (Remote Network Monitoring) is an Internet Engineering Task Force (IETF) standard monitoring specification that allows various network agents and console systems to exchange network monitoring data. RMON provides you with comprehensive network fault diagnosis, planning, and performance-tuning information, and helps you manage your network in a more proactive manner. If configured correctly, RMON probes deliver information before problems occur. This means that you can take action before the problems affect users.

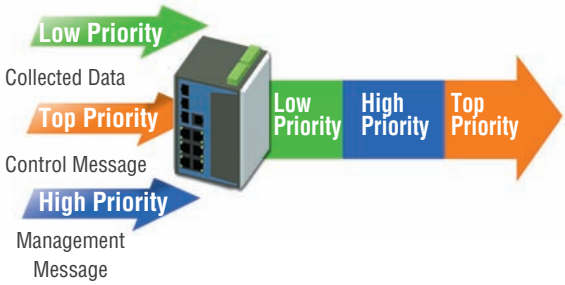
VLAN Eases Network Planning

A VLAN is a group of devices that can be located anywhere on a network, but which communicate as if they are on the same physical segment. VLANs can be used to segment your network without being restricted by physical connections—a limitation imposed by traditional network design. Besides, since all automation systems incorporate sensitive devices that must be protected from unauthorized access, it is very important to have some type of authentication system set up that only allows authorized users to access the system. If devices belong to different VLANs, they cannot communicate with each other, providing extra security and protection from unwanted invasion or traffic. The IEEE 802.1Q standard and GVRP protocol can exchange the same interoperable parameters to keep consistent VLAN settings over the entire network.



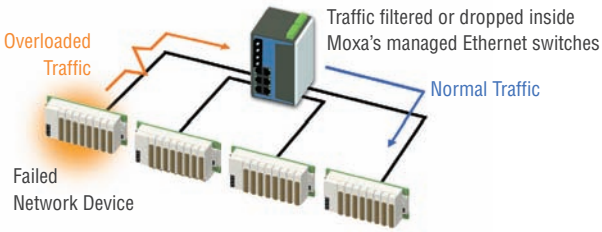
QoS Increases Determinism

Quality of Service (QoS) provides a traffic prioritization capability to ensure that important data is delievered consistently and predictably. Moxa's managed Ethernet switches can inspect IEEE 802.1p/1Q layer 2 CoS tags, and even layer 3 TOS information, to provide a consistent classification of the entire network. The QoS capability of the managed Ethernet switches improve your industrial network's performance and determinism for mission-critical applications.



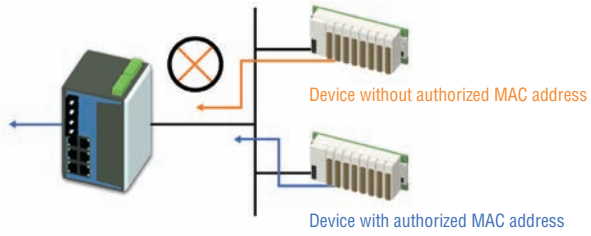
Bandwidth Management Prevents Unpredictable Network Status

Unlimited bandwidth should not be given to any single device on a network, particularly in light of what could happen if the device malfunctions. The most well-known problem is the broadcast storms caused by setting up the wrong topology, or by devices that malfunction. Moxa's managed Ethernet switches not only prevent broadcast storms, but in addition, the ingress/egress rate of unicast/multicast/broadcast packets can also be configured to give administrators full control of limited bandwidth to prevent unpredictable faults.



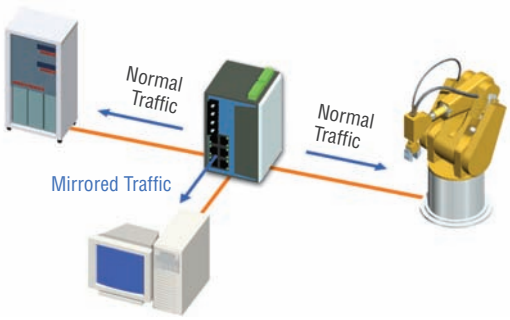
Port Lock Limits Access by MAC Address

Moxa's managed Ethernet switches (not including the EDS-400A) can use the Port Lock function to assign protected static MAC addresses to specific ports. Locked ports will not be able to learn other addresses, but only allow traffic that comes from the preset static MAC address, helping block unwanted invasion and usage.



Port Mirroring for Online Monitoring

In some cases, a network is so large that it is difficult to achieve the expected level of communications. Industrial communications applications use more of a command-response style than the file-transfer style used in office network environments. This means that when first setting up an industrial Ethernet network, control engineers may need to use a second port to monitor the actual activity between their devices and computer host. The mirroring port function on Moxa's managed Ethernet switches helps ensure that the system behaves as expected.



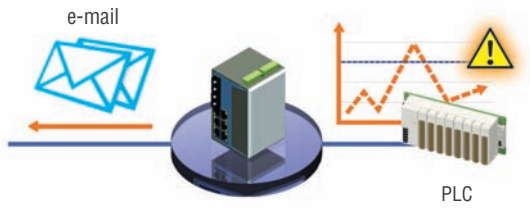
Automatic Warning by Event

Since industrial Ethernet devices are often located at remote parts of a network, it may be hard for system administrators to keep track of the status of such devices. The traditional method used to determine the status of devices is to poll devices periodically, but this is not "real-time" enough for many modern applications, and also wastes precious computing resources. A more modern solution to this problem is to use industrial Ethernet switches that provide system maintainers with real-time alarm messages almost instantaneously when exceptions occur. In other words, warning messages are triggered actively when the events occur. In order to handle these requirements, industrial Ethernet switches need a number of important features, as described below.

Warning by e-mail

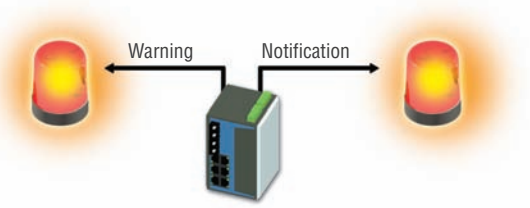
Moxa's managed Ethernet switches send out a warning e-mail when an exception is detected, providing system managers with real-time alarm messages.

Switch Events		Port Events
Cold Start	Warm Start	Link On
Power On/Off	Authentication Failure	Link Off
Topology Change	Configuration Change	Traffic Overload



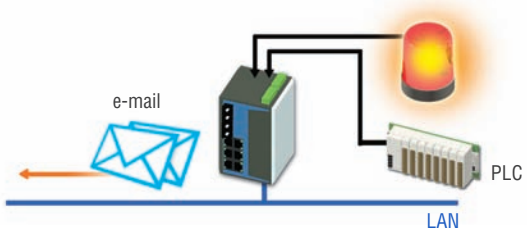
Warning by Relay Output

The managed Ethernet switches provide relay outputs that can be configured to indicate the importance of events when notifying or warning engineers in the field. In response, engineers can respond quickly and with the appropriate emergency maintenance procedures to higher priority messages.



DI for Integrating Other Important Sensors

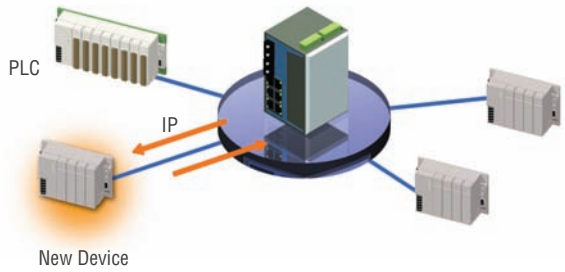
Moxa's managed Ethernet switches (not including the EDS-400A or IKS series switches) have two digital inputs for integrating sensors into the Ethernet switches' automatic alarm mechanism. This is done by redirecting warning messages to an IP network by e-mail notification.

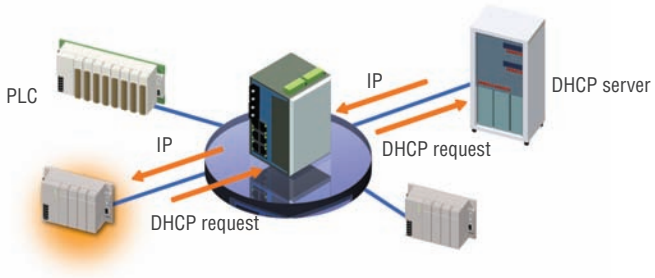


Replacing Faulty Devices

To reduce the effort required to configure IP addresses, Moxa's managed Ethernet switches support DHCP/BootP server and RARP protocols, which are used to automatically configure the IP addresses of Ethernet-enabled devices.

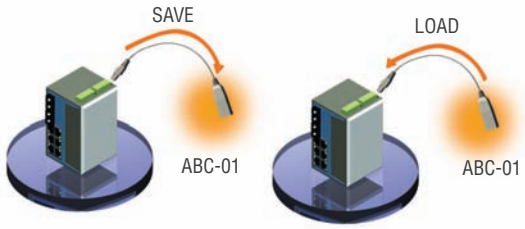
In addition, Moxa's managed Ethernet switches can also play the role of DHCP relay agent (with Option 82 support) to forward DHCP requests and provide information details (such as the slot ID, port number, and VLAN ID) for the authentication of DHCP servers.





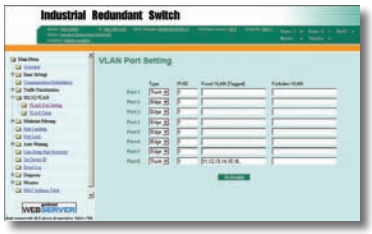
ABC-01 Provides a Seamless Backup Solution

Moxa's ABC-01 is designed to save and load the configuration of a Moxa managed Ethernet switch. Simply plug the ABC-01 into the Ethernet switch's RS-232 console port, and then use the Ethernet switch's HMI utility to save or load the configuration. The ABC-01 makes it easy to manage your network, particularly when you need to back up or replace an Ethernet switch. You can quickly reinstall a substitute Ethernet switch (of the same model) or recover the entire system configuration if an Ethernet switch failure occurs.



Easy Browser-based Configuration

Moxa's managed Ethernet switches can be configured easily over the network by web browser, Telnet console, or a Windows utility provided by Moxa. In addition, it is simple to back up configuration parameters and update firmware in the managed Ethernet switches with these user-friendly tools.



Network Management with Moxa's SNMP OPC Server Software

The Moxa SNMP OPC Server Pro software package can convert SNMP into OPC format. The vertical integration of SNMP management information into existing OPC-based SCADA packages gives the customer the ability to establish an Ethernet network management application that is integrated with existing visualization and control applications.

Modular Design, Maximum Flexibility

Innovative Modular Design

Scalable Gigabit Modular Solution

A bandwidth 100 Mbps is not enough to meet the requirements posed by industrial Ethernet applications that involve transmitting both voice and video. The EDS-728/828 and IKS-6726 Ethernet switches, which support Gigabit Ethernet ports and Gigabit Turbo Ring, can be used to create a reliable, high performance network backbone. Select Gigabit modules that meet your current needs, or to set up your system for future requirements.

Flexible Fast Ethernet Module

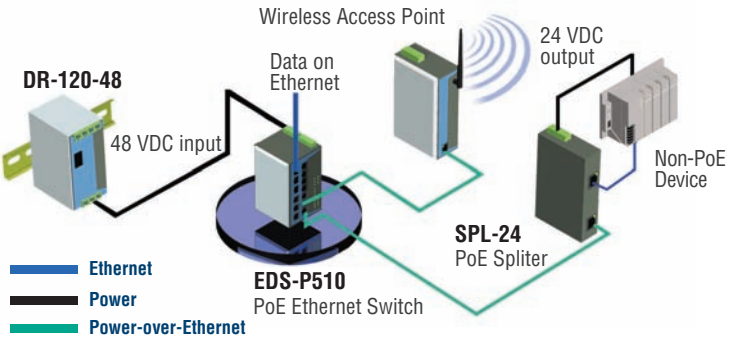
Up to 24 Fast Ethernet ports can be installed in the EDS-728/828 and IKS-6726 Ethernet switches. Select from a variety of Fast Ethernet interface modules wtih a combination of 10/100BaseT(X) (RJ45 connectors) and 100BaseFX (single/multi-mode, SC/ST connectors) ports. Long-haul single mode optical fiber can be used to provide 100 Mbps transmission over a distance of 40 km or 80 km.

Easy and Flexible Installation

Moxa's Ethernet switches are designed for DIN-Rail, wall mounting, and 19-inch rack mounting. The rugged, user-friendly DIN-Rail kit, which is easily installed with a flat-head screw driver, has passed stringent industrial vibration, freefall, and shock tests, and the wall mounting kit provides users with a handy option that meets the requirements of many different industrial applications. In addition, the 19-rack mounting kit can be used to securely mount non-rack DIN-Rail devices to a 19-inch rack cabinet.

Power-over-Ethernet Solution for Simple and Flexible Connections

Moxa provides a complete range of solutions for IEEE 802.3af PoE compliant units and Ethernet-enabled devices. The Gigabit PoE managed Ethernet switch, the EDS-P510, can be used not only to simplify wiring in the field, but also to provide advanced network control and management. In addition, the devices can be placed up to 328 feet (100 m) from a PSE.



Managed Ethernet Switch Comparison Chart

	Interface								Features										
Model	Total Number of Ports	Gigabit Ethernet (10/100/1000 Mbps)	Fast Ethernet (10/100 Mbps)	PoE, Fast Ethernet (10/100 Mbps)	Digital Output	Digital Input	Turbo Ring DIP Switch	Layer 3 Switching	Turbo Ring	RSTP/STP	IGMP snooping/GMRP	Port-Trunking/LACP	IEEE 802.1X/HTTPS/SSH	SNMP/RMON	802.1Q VLAN	Port-based VLAN	QoS	ABC-01*
Rackmount Managed Ethernet Switches																			
IKS-6726	26	2	24	---	1	---	---	---	√	√	√	√	√	√	√	---	√	√
IKS-6726-PoE	26	2	8	16	1	---	---	---	√	√	√	√	√	√	√	---	√	√
DIN-Rail Managed Ethernet Switches																			
EDS-828	28	4	24	---	2	2	---	√	√	√	√	√	√	√	√	---	√	√
EDS-728	28	4	24	---	2	2	---	---	√	√	√	√	√	√	√	---	√	√
EDS-608	8	---	8	---	1	1	√	---	√	√	√	√	√	√	√	√	√	√
EDS-G509	9	9	---	---	2	2	√	---	√	√	√	√	√	√	√	√	√	√
EDS-518A	18	2	16	---	2	2	---	---	√	√	√	√	√	√	√	√	√	√
EDS-516A	16	---	16	---	2	2	---	---	√	√	√	√	√	√	√	√	√	√
EDS-510A	10	3	7	---	2	2	√	---	√	√	√	√	√	√	√	√	√	√
EDS-508A	8	---	8	---	2	2	√	---	√	√	√	√	√	√	√	√	√	√
EDS-505A	5	---	5	---	2	2	√	---	√	√	√	√	√	√	√	√	√	√
EDS-408A	8	---	8	---	1	---	√	---	√	√	---	---	---	√	---	√	√	√
EDS-405A	5	---	5	---	1	---	√	---	√	√	---	---	---	√	---	√	√	√
EDS-P510	10	3	3	4	2	2	√	---	√	√	√	√	√	√	√	√	√	√

* ABC-01 is an RS-232 RJ45-based automatic backup configurator for Moxa's managed Ethernet switches. See page 3-48 for detailed information.

IKS-6726 Series

24+2G-port Gigabit modular managed Ethernet switches

- Meets UL 60950-1, NEMA TS2, EN50155/EN50121-4, and DNV/GL certifications
- Turbo Ring and RSTP/STP for Ethernet redundancy
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply
- Modular design lets you choose from a variety of media combinations
- -40 to 75°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The IKS-6726 series of industrial rackmount Ethernet switches are designed to meet the rigorous demands of mission critical applications for industry and business, such as traffic control systems (NEMA TS2) and maritime applications (DNV/GL). The IKS-6726's Gigabit and fast Ethernet backbone, redundant ring, and 24/48 VDC or 110/220 VDC/VAC dual isolated redundant power supplies increase the reliability of your communications and save on cabling and wiring costs. The modular design of the IKS-6726 also makes network planning easy, and allows greater flexibility by letting you install up to 2 Gigabit ports and 24 fast Ethernet ports.

Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- Turbo Ring and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocols to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status with "Lock port" to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, Windows utility, and ABC-01 automatic backup configurator

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMP v1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog (Available Soon: DHCP Option 66/67/82, Modbus/TCP, LLDP, IEEE 1588 PTP, IPv6)

Modular Rackmount Ethernet Switch System, IKS-6726

MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

Fast Ethernet: Slots 1 and 2 for any combination of 4, 6, 7, or 8-port PM-7200 fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST connector), or 100BaseSFP

Gigabit Ethernet: Slot 3 for 2-port PM-7200 Gigabit Ethernet combo module with 10/100/1000BaseT(X) or 1000BaseSFP slots

Console Port: RS-232 (RJ45 connector)

System LED Indicators: STAT, PWR1, PWR2, FAULT, MASTER, COUPLER

Module LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED

Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage: 24 VDC (18 to 36 V), or 48 VDC (36 to 72 V), or 110/220 VDC/VAC (88 to 300 VDC and 85 to 264 VAC)

Input Current: (all ports are equipped with fiber)
- Max. 1.11 A @ 24 VDC
- Max. 0.56 A @ 48 VDC
- Max. 0.56/0.28 A @ 110/220 VDC
- Max. 0.56/0.28 A @ 110/220 VAC

Overload Current Protection: Present

Connection: 10-contact terminal block

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)

Weight: 4200 g

Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F), cold start requires min. of 100 VAC at -40°C

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL60950-1, CSA C22.2 No. 60950-1, EN60950-1 (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

Maritime: DNV (Pending), GL (Pending)

Traffic Control: NEMA TS2 (Pending)

Rail Traffic: EN50155/EN50121-4

Note: Please check Moxa's website for the most up-to-date certification status.

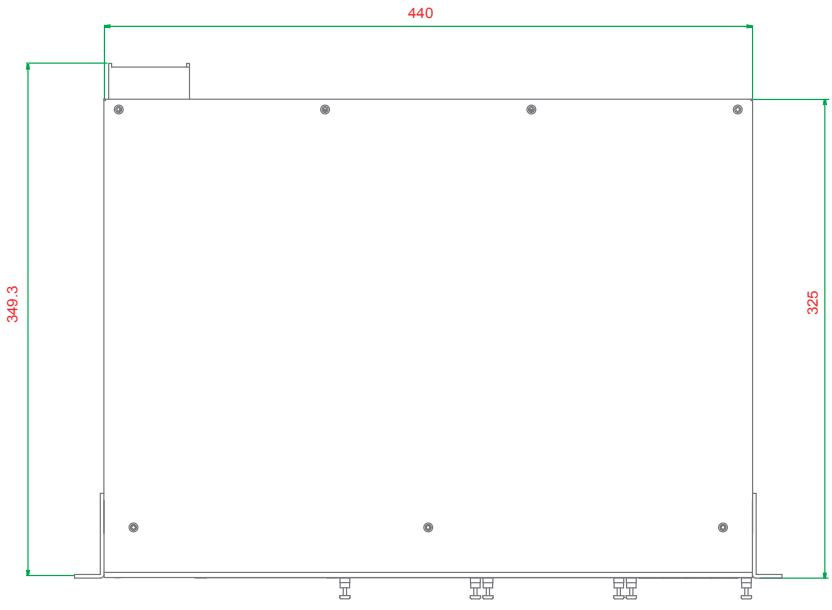
Warranty

Warranty Period: 5 years

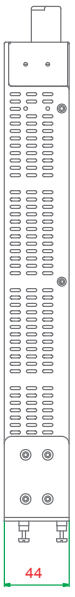
Details: See www.moxa.com/warranty

Dimensions (unit = mm)

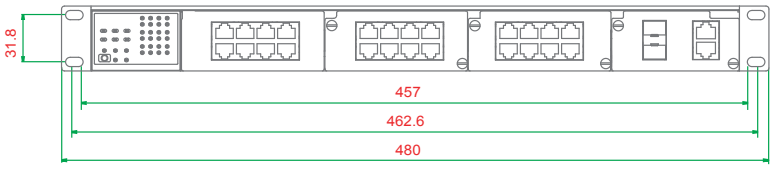
Rear View



Top View



Side View



Front View

Ordering Information

Step 1: Select Ethernet switch system

IKS-6726 with power supply

Step 2: Select interface modules

PM-7200 modules
(Gigabit or fast Ethernet)

Note: The IKS-6726 Ethernet switch system is delivered without interface modules. Please see page 4-31 to determine which PM-7200 interface modules are suitable for your application.

IKS-6726 Modular Rackmount Ethernet Switch System

Modular managed rackmount Ethernet switch systems with 8 fixed 10/100BaseT(X) ports, 2 slots for fast Ethernet modules, and 1 slot for a Gigabit Ethernet module. Supports up to 24+2G ports, -40 to 75°C operating temperature.

Available Models	Power Supply					
	Isolated Power Supply 1			Isolated Power Supply 2		
Front Cabling, Front Display	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC
IKS-6726-F-24-T	1	---	---	---	---	---
IKS-6726-F-24-24-T	1	---	---	1	---	---
IKS-6726-F-24-48-T	1	---	---	---	1	---
IKS-6726-F-24-HV-T	1	---	---	---	---	1
IKS-6726-F-48-T	---	1	---	---	---	---
IKS-6726-F-48-48-T	---	1	---	---	1	---
IKS-6726-F-48-HV-T	---	1	---	---	---	1
IKS-6726-F-HV-T	---	---	1	---	---	---
IKS-6726-F-HV-HV-T	---	---	1	---	---	1

Gigabit/Fast Ethernet Module Compatibility Chart for the IKS-6726

	Interface Module																								
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1LSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8PoE	PM-7200-8SFP	PM-7200-4M12
Slot 1	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 2	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 3	---	√	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

IKS-6726-PoE Series

24+2G-port IEEE 802.3af PoE Gigabit modular managed Ethernet switches

- Provides 15.4 W (per port) to up to 16 PoE ports when 48 VDC power is applied
- Supports a total of 120 W for smart PoE power management when HV power is applied
- PoE and Ethernet combo module supported, IEEE 802.3af-compliant
- Meets UL 60950-1, NEMA TS2, EN50155/EN50121-4, and DNV/GL certifications
- Turbo Ring and RSTP/STP for Ethernet Redundancy
- Modular design lets you choose from a variety of media combinations
- -40 to 75°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The IKS-6726-PoE series of industrial rackmount Ethernet switches are designed to meet the demands of mission critical applications for business and industry, such as traffic control systems (NEMA TS2), power automation, and critical facility surveillance. The IKS-6726-PoE comes standard with up to 16 10/100BaseT(X) 802.3af (PoE) compliant Ethernet ports and 2 combo Gigabit Ethernet ports. The IKS-6726-PoE Ethernet switches provide two kinds of power input source: 48 VDC and 110/220 VDC/VAC. The IKS-6726-PoE 48 VDC model supports up to 15.4 watts of power per PoE port, and allows power to be supplied to connected devices when AC power is not readily available or is cost-prohibitive to provide locally. The IKS-6726-PoE HV model supports a total of 120 W for smart PoE power management when HV power is applied. When supplied with 120 W of power, the IKS-6726-PoE HV model can supply power to up to 16 PoE ports. The switches support a variety of management functions, including Turbo Ring, RSTP/STP, IGMP, VLAN, QoS, RMON, bandwidth management, and port mirroring, and are designed especially for security automation applications such as IP surveillance and gate of entry systems, which can benefit from a scalable backbone construction and Power-over-Ethernet support.

Features and Benefits

- Advanced PoE management function
- IEEE 802.3af-compliant PoE and Ethernet combo ports
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- Turbo Ring and RSTP/STP (IEEE 802.1w/D) supported
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocols to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management to prevent unpredictable network status with "Lock port" to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/serial console, Windows utility, and ABC-01 automatic backup configurator

Specifications

Technology

Standards:
IEEE 802.3af for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

IKS-6726-PoE Modular Rackmount Ethernet Switch System

Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog (Available Soon: DHCP Option 66/67/82, Modbus/TCP, LLDP, IEEE 1588 PTP, IPv6)

MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

Fast Ethernet: Slots 1 and 2 for any combination of 4, 6, 7, or 8-port PM-7200 fast Ethernet modules with 10/100BaseT(X) (TP/PoE/M12 interface), 100BaseFX (SC/ST connector), or 100BaseSFP

Gigabit Ethernet: Slot 3 for 2-port PM-7200 Gigabit Ethernet combo module with 10/100/1000BaseT(X) or 1000BaseSFP ports

Console Port: RS-232 (RJ45 connector)

System LED Indicators: STAT, PWR1, PWR2, FAULT, MASTER, COUPLER

Module LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED, PoE on module

Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage: 24 VDC (18 to 36 V), 48 VDC (36 to 72 V), or 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)

Input Current:

- Max. 5.8 A @ 48 VDC (supports up to 16 ports at 15.4 W per PoE port)
- Max. 1.85/0.94 A @ 110/220 VDC (120 W total for PoE ports)
- Max. 1.54/0.78 A @ 110/220 VAC (120 W total for PoE ports)

Overload Current Protection: Present

Connection: 10-contact terminal block

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)

Weight: 4200 g

Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F), cold start requires min. of 100 VAC at -40°C

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL60950-1, CSA C22.2 No. 60950-1, EN60950-1 (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A (Pending)

Maritime: DNV (Pending), GL (Pending)

Traffic Control: NEMA TS2 (Pending)

Rail Traffic: EN50155/EN50121-4 (Pending)

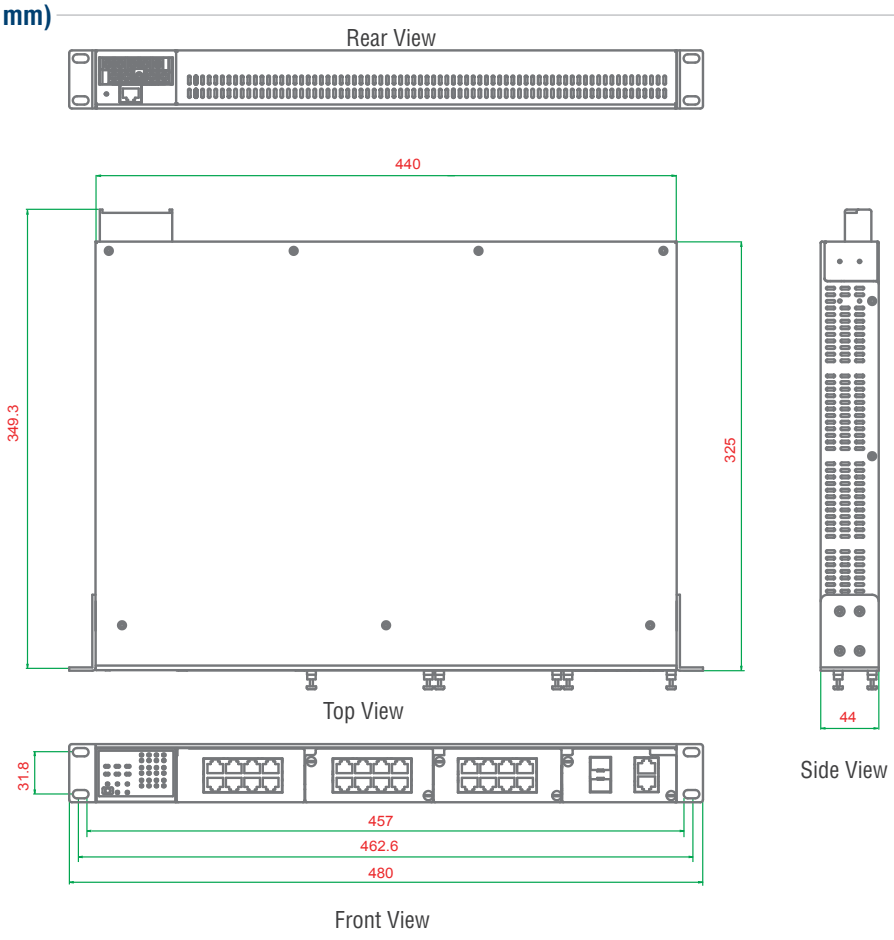
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Ordering Information

Step 1: Select Ethernet switch system

IKS-6726-PoE with power supply

Step 2: Select interface modules

PM-7200 series
(Gigabit or fast Ethernet)

Note: The IKS-6726-PoE Ethernet switch system is delivered without interface modules. Please see page 4-31 to determine which PM-7200 interface modules are suitable for your application.

IKS-6726-PoE Modular Rackmount Ethernet Switch System

Modular managed rackmount Ethernet switch system with 8 10/100BaseT(X) ports, 2 slots for fast Ethernet modules (PoE), and 1 slot for Gigabit Ethernet modules. Supports up to 24+2G ports and up to 16 PoE ports, -40 to 75°C operating temperature

Available Models	Power Supply			
Front Cabling, Front Display	Isolated Power Supply 1		Isolated Power Supply 2	
	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC
IKS-6726-PoE-F-48-T	1	---	---	---
IKS-6726-PoE-F-48-48-T	1	---	1	---
IKS-6726-PoE-F-48-HV-T	1	---	---	1
IKS-6726-PoE-F-HV-T	---	1	---	---
IKS-6726-PoE-F-HV-HV-T	---	1	---	1

Note: The HV power module supplies a total of 30 W to the system and 120 W for PoE power management.

Gigabit/Fast Ethernet Module Compatibility Chart for the IKS-6726-PoE

	Interface Module																							
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1LSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8PoE	PM-7200-8SFP	PM-7200-4M12
Slot 1	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Slot 2	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Slot 3	---	√	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

EDS-828

24+4G-port Layer 3 Gigabit modular managed Ethernet switch

- Layer 3 routing interconnects multiple LAN segments
- 4 Gigabit plus 24 fast Ethernet ports for copper and fiber
- Gigabit Turbo Ring and RSTP/STP (IEEE 802.1w/D) for Ethernet redundancy
- QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c, RMON supported
- SNMPv3, HTTPS, SSH, IEEE 802.1X, and port security supported

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-828 is a high-performance Layer 3 Ethernet switch designed for network routing. The improved hardware technology built into the EDS-828 replaces the software logic used by traditional routers, offering better performance, and making the switch ideal for large-scale local area networks (LANs). In addition to Layer 3 features, the EDS-828 also supports Layer 2 management features, including QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c/v3, RMON, IEEE 802.1X, HTTPS, and SSH. In order to meet the demands of any industrial application, the EDS-828 uses a modular design that allows users to install up to 4 Gigabit Ethernet ports and 24 fast Ethernet ports, providing a high degree of flexibility for network expansion.

Features and Benefits

- Layer 3 switching functionality to move data and information across networks
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- Redundant Gigabit Turbo Ring and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocol to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- Port Trunking for optimum bandwidth utilization
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs for integrating sensors and alarms with IP networks
- Redundant, dual DC power inputs
- Configurable by Web browser, Telnet/Serial console, Windows utility, and ABC-01 automatic backup configurator

Specifications

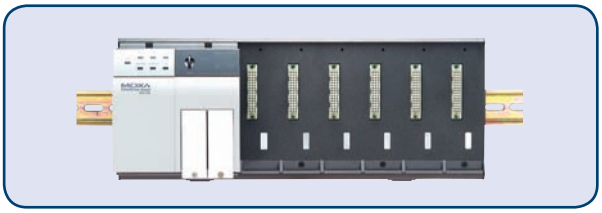
Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX/EZX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, Syslog (Available Soon: DHCP Option 66/67/82, SSH, LLDP, IEEE 1588 PTP, Modbus/TCP, SNMP Inform)

Layer 3 Switching: Static routing, RIP V1/V2 (Available Soon: OSPF, DVMRP, PIM-DM, VRRP)

Layer 3 Modular Managed Ethernet Switch System, EDS-82810G



MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

Fast Ethernet: 6 slots for any combination of 4-port interface modules, 10/100BaseT(X) or 100BaseFX

Gigabit Ethernet: 2 slots for any combination of 2-port interface modules, 10/100/1000BaseT(X) or 1000BaseSFP slot

Console Port: RS-232 (RJ45 connector)

System LED Indicators: STAT, PWR1, PWR2, FAULT, MASTER, COUPLER, T.RING

Module LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED

Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC

Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
- +13 to +30V for state "1"
- -30 to +3V for state "0"
- Max. input current: 8 mA

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant dual inputs

Input Current: 0.96 A @ 24 V

Overload Current Protection: Present

Connection: 2 removable 6-contact terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 362.4 x 142.47 x 128 mm (14.27 x 5.61 x 5.04 in)

Weight: 1950 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508 (Pending), UL60950-1, CSA C22.2 No. 60950-1, EN60950-1 (Pending)

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C, and D (Pending); ATEX Class I, Zone 2, Ex nC IIC (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 4
EN61000-4-5 (Surge), level 4
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11
EN61000-4-12

Maritime: DNV (Pending), GL (Pending)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time: 160,000 hrs

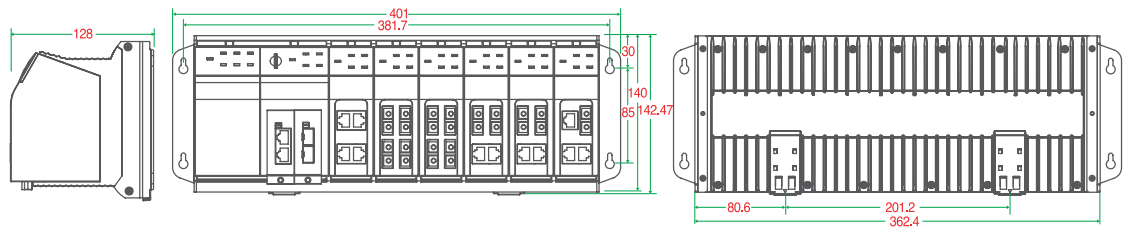
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Side View Front View Rear View

Ordering Information

Step 1: Select Ethernet switch system

EDS-82810G

Step 2: Select interface modules

IM series (Gigabit or fast Ethernet)

Note: The EDS-82810G switch system is delivered without interface modules. Please see page 3-26 for product information related to the IM series Gigabit and fast Ethernet interface modules.

Available Models

EDS-82810G: Layer 3 modular managed Ethernet switch system with 6 slots for 4-port fast Ethernet interface modules and 2 slots for 2-port Gigabit interface modules, for up to 24+4G ports

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-32: Wall mounting kit for the EDS-728/828 series

RK-4U: 4U-high 19" rack mounting kit

EDS-728

24+4G-port Gigabit modular managed Ethernet switch

- 4 Gigabit plus 24 fast Ethernet ports for copper and fiber
- Gigabit Turbo Ring and RSTP/STP (IEEE 802.1w/D) for Ethernet redundancy
- QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c, RMON supported
- SNMPv3, HTTPS, SSH, IEEE 802.1X, and port security supported
- ABC-01 Automatic Backup Configurator for system configuration backup (optional accessory)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-728 modular Gigabit Ethernet switch features a versatile modular design that allows different combinations of fiber and copper modules, creating a wide array of connection options ideal for any automation network. The modular design lets you install up to 4 Gigabit ports and 24 fast Ethernet ports. The EDS-728 is specially designed for redundant Gigabit network backbones and uses a modular configuration to provide a high degree of flexibility for network expansion. Top network performance, security, and reliability is assured through the EDS-728's advanced management features, including QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c/v3, RMON, IEEE 802.1X, HTTPS, and SSH. The EDS-728 also features industrial-grade construction, a console port for automatic configuration backup, and an angled LED troubleshooting panel that can be conveniently viewed from both horizontal and vertical orientations.

Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- Redundant Gigabit Turbo Ring and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocol to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port for only authorized MAC address access
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs to integrate sensors and alarms with IP networks
- Redundant, dual DC power inputs
- Configurable by Web browser, Telnet/Serial console, Windows utility, and ABC-01 automatic backup configurator

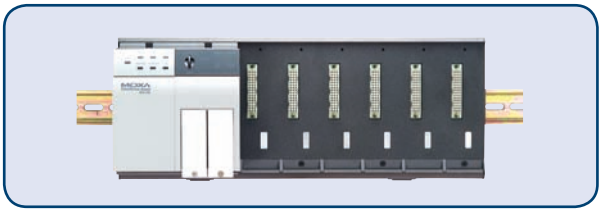
Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX/EZX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, Syslog (Available Soon: DHCP Option 66/67/82, SSH, SNMP Inform, Modbus/TCP, LLDP, IEEE 1588 PTP, IPv6)

Modular Managed Ethernet Switch System, EDS-72810G



MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

Fast Ethernet: 6 slots for any combination of 4-port interface modules, 10/100BaseT(X) or 100BaseFX

Gigabit Ethernet: 2 slots for any combination of 2-port interface modules, 10/100/1000BaseT(X) or 1000BaseSFP slot

System LED Indicators: STAT, PWR1, PWR2, FAULT, MASTER, COUPLER, T.RING

Module LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED

Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC

Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
- +13 to +30V for state "1"
- -30 to +3V for state "0"
- Max. input current: 8 mA

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant dual inputs

Input Current: 0.96 A @ 24 V

Overload Current Protection: Present

Connection: 2 removable 6-contact terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 362.4 x 142.47 x 128 mm (14.27 x 5.61 x 5.04 in)

Weight: 1950 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508 (Pending), UL60950-1, CSA C22.2 No. 60950-1, EN60950-1 (Pending)

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C, and D (Pending); ATEX Class I, Zone 2, Ex nC IIC (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 4
EN61000-4-5 (Surge), level 4
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11
EN61000-4-12

Maritime: DNV (Pending), GL (Pending)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time: 160,000 hrs

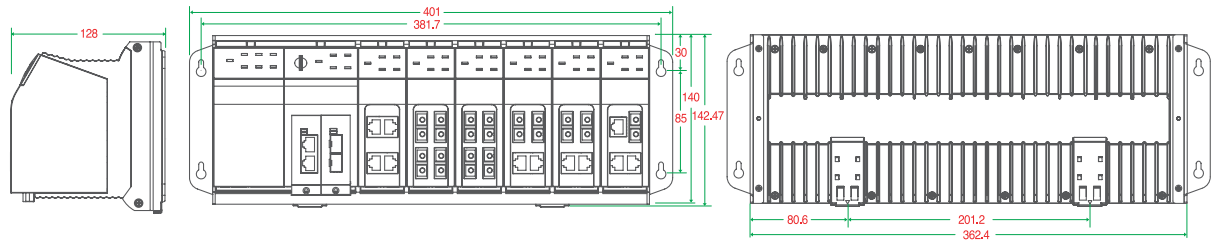
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Side View | Front View | Rear View

Ordering Information

Step 1: Select Ethernet switch system → **Step 2: Select interface modules**

EDS-72810G → IM series (Gigabit or fast Ethernet)

Note: The EDS-72810G switch system is delivered without interface modules. Please see page 3-26 for product information related to the IM series Gigabit and fast Ethernet interface modules.

Available Models

EDS-72810G: Modular managed Ethernet switch system with 6 slots for 4-port fast Ethernet interface modules and 2 slots for 2-port Gigabit interface modules, for up to 24+4G ports

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-32: Wall mounting kit for the EDS-728/828 series

RK-4U: 4U-high 19" rack mounting kit

Coming Soon

EDS-608 Series

Preliminary

8-port compact modular managed Ethernet switches

- Modular design lets you choose from a variety of media combinations
- Turbo Ring and RSTP/STP (IEEE 802.1w/D) for Ethernet redundancy
- QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c, RMON supported
- SNMPv3, HTTPS, SSH, IEEE 802.1X, and port security supported
- -40 to 75°C operating temperature (T models)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The versatile modular design of the compact EDS-608 Ethernet switch allows users to combine fiber and copper modules to create switch solutions suitable for any automation network. The EDS-608's modular design lets you install up to 8 fast Ethernet ports, and the advanced Turbo Ring (recovery time < 20 ms) technology and RSTP/STP (IEEE 802.1w/D) helps increase the reliability and availability of your industrial Ethernet network. Models with an extended operating temperature range of -40 to 75°C are also available. The EDS-608 supports several reliable and intelligent functions, including QoS, IGMP snooping/GMRP, VLAN, Port Trunking, SNMPv1/v2c/v3, IEEE 802.1X, HTTPS, SSH, and RMON, making the Ethernet switches suitable for any harsh industrial environment.

Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring (recovery time < 20 ms at full load) and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs to integrate sensors and alarms with IP networks

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, LLDP, Modbus/TCP, IEEE 1588 PTP, IPv6

MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

Fast Ethernet: 2 slots for any combination of 4-port interface modules, 10/100BaseT(X) or 100BaseFX

System LED Indicators: PWR1, PWR2, FAULT, MASTER, COUPLER

Module LED Indicators: 10/100M for TP port, 100M for Fiber port

Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
- +13 to +30V for state "1"
- -30 to +3V for state "0"
- Max. input current: 8 mA

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs

Overload Current Protection: Present

Connection: 1 removable 5-contact and 1 removable 6-contact terminal block

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 124.9 x 151 x 157.2 mm (4.92 x 5.95 x 6.19 in)

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508 (Pending), EN60950-1 (Pending)

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C, and D (Pending); ATEX Class I, Zone 2, Ex nC IIC (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11
EN61000-4-12

Maritime: DNV (Pending), GL (Pending)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

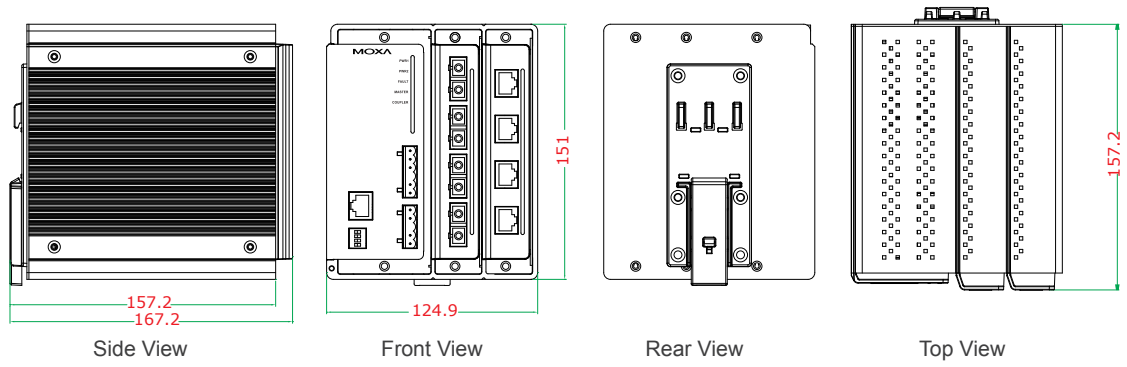
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Side View | Front View | Rear View | Top View

Ordering Information

Step 1: Select Ethernet switch system → **Step 2: Select interface modules**

EDS-608 → CM Series

Note: The EDS-608 switch system is delivered without interface modules. Please see page 3-28 for product information related to the CM series fast Ethernet interface modules.

Available Models

EDS-608: Compact managed Ethernet switch system with 2 slots for 4-port fast Ethernet interface modules, up to 8 ports, 0 to 60°C operating temperature

EDS-608-T: Compact managed Ethernet switch system with 2 slots for 4-port fast Ethernet interface modules, up to 8 ports, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

RK-4U: 4U-high 19" rack mounting kit

IM Series

2-port Gigabit Ethernet and 4-port fast Ethernet interface modules for EDS-728/828 series Ethernet switches

Specifications

Gigabit Ethernet Interface Modules, IM-2G Series

IM-2GTX

IM-2GSFP

Interface

Fiber Ports: 1000BaseSFP slot

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed and auto MDI/MDI-X connection

LED Indicators: Port status

Note: Please see page 3-45 for product information related to the SFP-1G series of Gigabit Ethernet SFP modules.

Power Requirements

Power Consumption:
IM-2GTX: 2.96 W
IM-2GSFP: 3.04 W

Physical Characteristics

Dimensions: 24 x 65.9 x 101.1 mm (0.94 x 2.59 x 3.98 in)

Weight:
IM-2GTX: 150 g
IM-2GSFP: 148 g

Fast Ethernet Interface Modules, IM Series

IM-4TX

IM-2MSC/2TX
IM-2SSC/2TX

IM-2MST/2TX

IM-1LSC/3TX

IM-4MSC
IM-4SSC

IM-4MST

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector)

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

LED Indicators: PWR, P1, P2, P3, P4 port status

Optical Fiber

	100BaseFX		
	Multi Mode	Single Mode	Single Mode, 80 km
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-10 dBm	0 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm
Link Budget	12 dB	29 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]	80 km [d]
Saturation	-6 dBm	-3 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Power Requirements

Power Consumption:
IM-4TX: 1.52 W
IM-2MSC/2TX: 2.43 W
IM-2MST/2TX: 2.43 W
IM-2SSC/2TX: 2.43 W
IM-1LSC/3TX: 2.5 W
IM-4MSC: 6.6 W
IM-4MST: 6.6 W
IM-4SSC: 6.6 W

Physical Characteristics

Housing: IP30 protection

Dimensions: 40 x 127.8 x 100 mm (1.57 x 5.03 x 3.94 in)

Weight:
IM-4TX: 215 g
IM-2MSC/2TX: 245 g
IM-2MST/2TX: 250 g
IM-2SSC/2TX: 245 g
IM-1LSC/3TX: 235 g
IM-4MSC: 250 g
IM-4MST: 270 g
IM-4SSC: 270 g

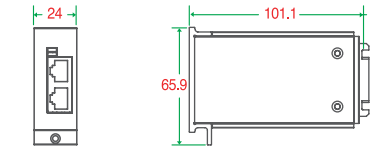
MTBF (meantime between failures)

Time: 620,000 hrs

Database: MIL-HDBK-217F, GB 25°C

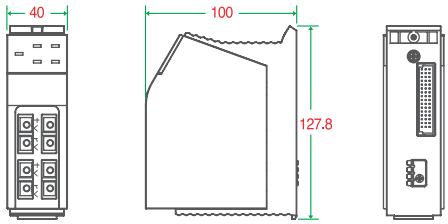
Dimensions (unit = mm)

Gigabit Ethernet Interface Modules



Front View Side View

Fast Ethernet Interface Modules



Front View Side View Rear View

Ordering Information

Available Models	Port Interface						
	Gigabit Ethernet		Fast Ethernet				
				100BaseFX			
	10/100/1000BaseT(X)	1000BaseSFP*	10/100BaseT(X)	Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector	Single-mode, SC Connector, 80 km
IM-2G Series							
IM-2GTX	2	---	---	---	---	---	---
IM-2GSFP	---	2	---	---	---	---	---
IM Series							
IM-4TX	---	---	4	---	---	---	---
IM-4MSC	---	---	---	4	---	---	---
IM-4MST	---	---	---	---	4	---	---
IM-2MSC/2TX	---	---	2	2	---	---	---
IM-2MST/2TX	---	---	2	---	2	---	---
IM-4SSC	---	---	---	---	---	4	---
IM-2SSC/2TX	---	---	2	---	---	2	---
IM-1LSC/3TX	---	---	3	---	---	---	1

* Please see page 3-45 for product information related to the SFP-1G series Gigabit Ethernet SFP modules.

Coming Soon

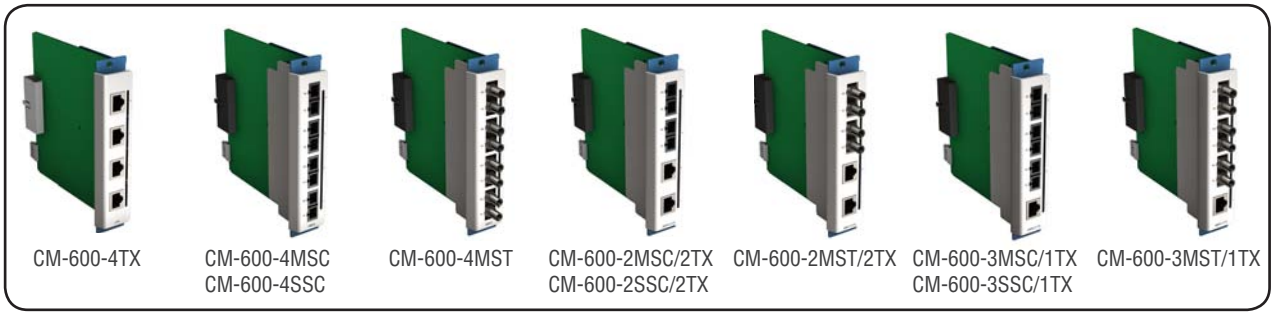
CM-600 Series

Preliminary

4-port fast Ethernet interface modules for EDS-608 series Ethernet switches

Specifications

Fast Ethernet Interface Modules, CM-600 Series



CM-600-4TX | CM-600-4MSC, CM-600-4SSC | CM-600-4MST | CM-600-2MSC/2TX, CM-600-2SSC/2TX | CM-600-2MST/2TX | CM-600-3MSC/1TX, CM-600-3SSC/1TX | CM-600-3MST/1TX

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector)

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

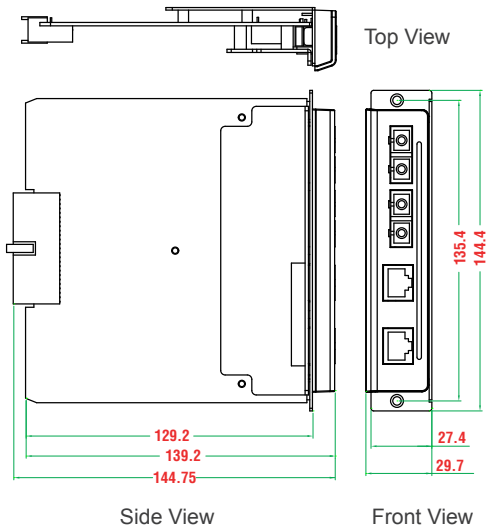
LED Indicators: 10/100 for TP port, 100M for fiber port

Optical Fiber

	100BaseFX		
	Multi Mode	Single Mode	Single Mode, 80 km
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-10 dBm	0 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm
Link Budget	12 dB	29 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]	80 km [d]
Saturation	-6 dBm	-3 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Dimensions (unit = mm)



Physical Characteristics

Housing: IP30 protection

Dimensions: 29.7 x 144.4 x 144.75 mm (1.17 x 5.69 x 5.7 in)

Ordering Information

Available Models	Port Interface			
	10/100BaseT(X)	100BaseFX		
		Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector
CM-600-4TX	4	---	---	---
CM-600-4MSC	---	4	---	---
CM-600-4MST	---	---	4	---
CM-600-4SSC	---	---	---	4
CM-600-2MSC/2TX	2	2	---	---
CM-600-2MST/2TX	2	---	2	---
CM-600-2SSC/2TX	2	---	---	2
CM-600-3MSC/1TX	1	3	---	---
CM-600-3MST/1TX	1	---	3	---
CM-600-3SSC/1TX	1	---	---	3

EDS-G509 Series

9G-port full Gigabit managed Ethernet switches

- 4 10/100/1000BaseT(X) ports plus 5 combo (10/100/1000BaseT(X) or 100/1000BaseSFP slot) Gigabit ports
- Fiber optic options for extending distance and improving electrical noise immunity
- Turbo Ring, RSTP/STP (IEEE 802.1w/D) for Ethernet redundancy
- QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c, RMON supported
- SNMPv3, HTTPS, SSH, IEEE 802.1X, and port security supported

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-G509 is equipped with 9 Gigabit Ethernet ports and up to 5 fiber optic ports, making it ideal for upgrading an existing network to Gigabit speed or building a new full Gigabit backbone. Gigabit transmission increases bandwidth for higher performance and transfers large amounts of video, voice, and data across a network quickly. Redundant Ethernet Turbo Ring and RSTP/STP (IEEE 802.1w/D) increase system reliability and the availability of your network backbone. The EDS-G509 series is designed especially for communication demanding applications, such as video and process monitoring, shipbuilding, ITS, and DCS systems, all of which can benefit from a scalable backbone construction.

Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- Turbo Ring and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- ABC-01 (Automatic Backup Configurator) for system configuration backup

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX/EZX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, Modbus/TCP (Available Soon: SNMP Inform, LLDP, IEEE 1588 PTP, IPv6)

MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

Fiber Ports: 100/1000BaseSFP slot

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed

Console Port: RS-232 (RJ45 connector)

DIP Switches: Turbo Ring, Master, Coupler, Reserve

LED Indicators: PWR1, PWR2, FAULT, 10/100/1000M, MASTER, COUPLER

Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC

Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
• +13 to +30V for state "1"
• -30 to +3V for state "0"
• Max. input current: 8 mA

Power Requirements

Input Voltage: 12/24/48 VDC redundant dual inputs

Input Current: 0.81 A @ 24 V

Overload Current Protection: Present

Connection: 2 removable 6-contact terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 87.1 × 135 × 107 mm (3.43 × 5.31 × 4.21 in)

Weight: 1510 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F) for T models

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508 (Pending), EN60950-1

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C, and D (Pending); ATEX Class I, Zone 2, Ex nC IIC (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11

Maritime: DNV (Pending), GL (Pending)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

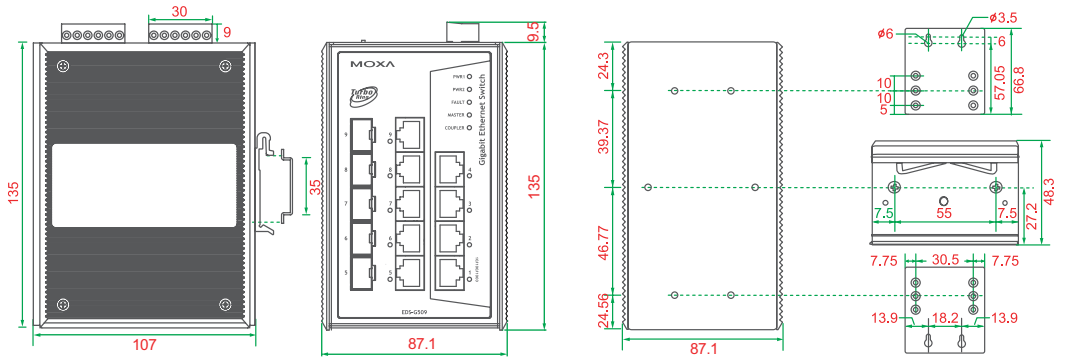
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models

EDS-G509: Industrial full Gigabit managed Ethernet switch with 4 10/100/1000BaseT(X) ports, and 5 10/100/1000BaseT(X) or 100/1000BaseSFP slot combo ports, 0 to 60°C operating temperature

EDS-G509-T: Industrial full Gigabit managed Ethernet switch with 4 10/100/1000BaseT(X) ports, and 5 10/100/1000BaseT(X) or 100/1000BaseSFP slot combo ports, -40 to 75°C operating temperature

Note: The EDS-G509 series switches support up to 5 100/1000BaseSFP slots. See page 3-45 and 3-47 for SFP-1G/1FE series Gigabit/fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

EDS-518A Series

16+2G-port Gigabit managed Ethernet switches

- 2 Gigabit plus 16 fast Ethernet ports for copper and fiber
- Turbo Ring (recovery time < 20 ms), RSTP/STP (IEEE 802.1w/D) for Ethernet redundancy
- QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c, RMON supported
- SNMPv3, HTTPS, SSH, IEEE 802.1X, and port security supported
- ABC-01 (Automatic Backup Configurator) for system configuration backup

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-518A is a standalone 18-port managed Ethernet switch that provides 2 combo Gigabit ports with built-in RJ45 or SFP slots for Gigabit fiber optic communication. The Ethernet redundant Turbo Ring (recovery time < 20 ms) increases the reliability and speed of your network backbone. The EDS-518A also supports intelligent network management functions, including QoS, IGMP snooping/GMRP, VLAN, Port Trunking, SNMPv1/v2c/v3, IEEE 802.1X, HTTPS, and SSH.

Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- Turbo Ring (recovery time < 20 ms at full load) and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- ABC-01 (Automatic Backup Configurator) for system configuration backup
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX/EZX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, Syslog (Available Soon: DHCP Option 66/67/82, SSH, SNMP Inform, Modbus/TCP, LLDP, IEEE 1588 PTP, IPv6)

MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

Fiber Ports: 100BaseFX (SC/ST connector) and 1000BaseSFP slot

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed

Console Port: RS-232 (RJ45 connector)

LED Indicators: PWR1, PWR2, FAULT, 10/100M (TP port), 100M (fiber port), MASTER, COUPLER

Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC

Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
• +13 to +30V for state "1"
• -30 to +3V for state "0"
• Max. input current: 8 mA

Optical Fiber

	100BaseFX		
	Multi-mode	Single-mode	Single-mode, 80 km
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-10 dBm	0 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm
Link Budget	12 dB	29 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]	80 km [d]
Saturation	-6 dBm	-3 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant dual inputs

Input Current:
EDS-518A: 0.51 A @ 24 V
EDS-518A-MM/SS: 0.61 A @ 24 V

Overload Current Protection: Present

Connection: 2 removable 6-contact terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 94 x 135 x 142.7 mm (3.7 x 5.31 x 5.62 in)

Weight: 1630 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508, UL60950-1, CSA C22.2 No. 60950-1, EN60950-1

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C, and D (Pending); ATEX Class I, Zone 2, Ex nC IIC (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 2
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 2
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11
EN61000-4-12

Maritime: DNV, GL

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time: 240,000 hrs

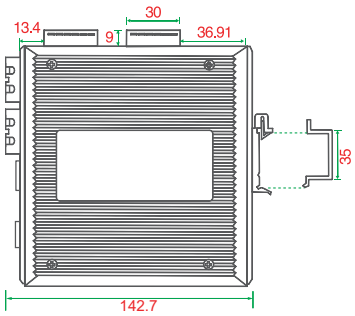
Database: Telcordia (Bellcore), GB

Warranty

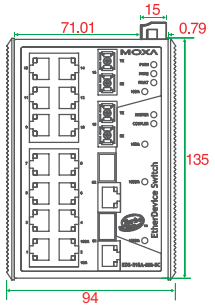
Warranty Period: 5 years

Details: See www.moxa.com/warranty

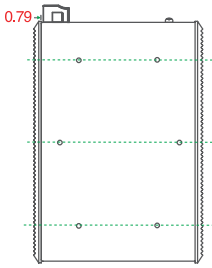
Dimensions (unit = mm)



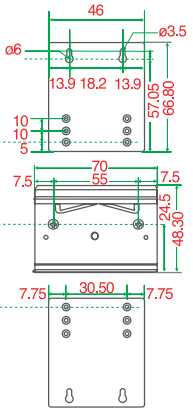
Side View



Front View



Rear View



DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface					
		Gigabit Ethernet	Fast Ethernet				
				100BaseFX			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	Combo Port, 10/100/1000BaseT(X) or 1000BaseSFP*	10/100BaseT(X)	Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector	Single-mode, SC Connector, 80 km
EDS-518A	EDS-518A-T	2	16	---	---	---	---
EDS-518A-MM-SC	EDS-518A-MM-SC-T	2	14	2	---	---	---
EDS-518A-MM-ST	EDS-518A-MM-ST-T	2	14	---	2	---	---
EDS-518A-SS-SC	EDS-518A-SS-SC-T	2	14	---	---	2	---
EDS-518A-SS-SC-80	---	2	14	---	---	---	2

Note: The EDS-518A series supports 2 1000BaseSFP slots. See page 3-45 for SFP-1G series Gigabit Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

EDS-510A Series

7+3G-port Gigabit managed Ethernet switches

- 2 Gigabit Ethernet ports for redundant ring and 1 Gigabit Ethernet port for uplink solution
- Turbo Ring (recovery time < 20 ms), RSTP/STP (IEEE 802.1w/D) for Ethernet redundancy
- QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c, RMON supported
- SNMPv3, HTTPS, SSH, IEEE 802.1X, and port security supported
- ABC-01 (Automatic Backup Configurator) for system configuration backup

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-510A Gigabit managed redundant Ethernet switch is equipped with up to 3 Gigabit Ethernet ports, making it ideal for building a Gigabit Turbo Ring, but leaving a spare Gigabit port for uplink use. The Ethernet redundant Turbo Ring (recovery time < 20 ms) and RSTP/STP (IEEE 802.1w/D) can increase system reliability and the availability of your network backbone. The EDS-510A series is designed especially for communication demanding applications such as process control, shipbuilding, ITS, and DCS systems, which can benefit from a scalable backbone construction.

Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- Turbo Ring (recovery time < 20 ms at full load) and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX/EZX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, Syslog (Available Soon: DHCP Option 66/67/82, SSH, SNMP Inform, Modbus/TCP, LLDP, IEEE 1588 PTP, IPv6)

MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

Fiber Ports: 1000BaseSFP slot

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed

Console Port: RS-232 (RJ45 connector)

DIP Switches: Turbo Ring, Master, Coupler, Reserve

LED Indicators: PWR1, PWR2, FAULT, 10/100M (TP port), 1000M (Gigabit port), MASTER, COUPLER

Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC

Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
- +13 to +30V for state "1"
- -30 to +3V for state "0"
- Max. input current: 8 mA

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant dual inputs

Input Current:
EDS-510A-3GT: 0.65 A @ 24 V
EDS-510A-1GT2SFP: 0.44 A @ 24 V
EDS-510A-3SFP: 0.46 A @ 24 V

Overload Current Protection: Present

Connection: 2 removable 6-contact terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)

Weight: 1170 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508, UL60950-1, CSA C22.2 No. 60950-1, EN60950-1

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C, and D; ATEX Class I, Zone 2, Ex nC IIC

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11

Maritime: DNV, GL

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time: 204,000 hrs

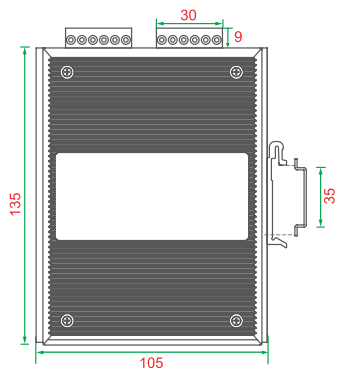
Database: MIL-HDBK-217J, GB 25°C

Warranty

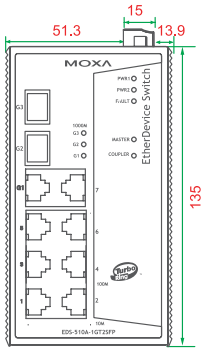
Warranty Period: 5 years

Details: See www.moxa.com/warranty

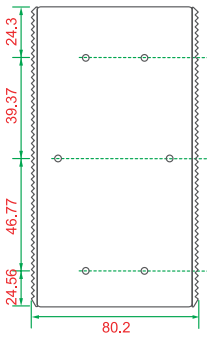
Dimensions (unit = mm)



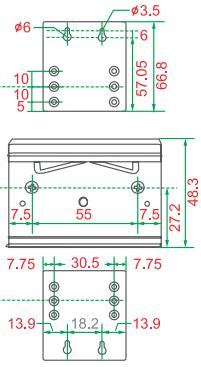
Side View



Front View



Rear View



DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface		
		Gigabit Ethernet		Fast Ethernet
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000BaseT(X)	1000BaseSFP*	10/100BaseT(X)
EDS-510A-3GT	EDS-510A-3GT-T	3	---	7
EDS-510A-1GT2SFP	EDS-510A-1GT2SFP-T	1	2	7
EDS-510A-3SFP	EDS-510A-3SFP-T	---	3	7

Note: The EDS-510A series supports up to 3 1000BaseSFP slots. See page 3-45 for SFP-1G series Gigabit Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

EDS-505A/508A/516A Series

5, 8, and 16-port managed Ethernet switches

- Plug-n-play Turbo Ring (recovery time < 20 ms), RSTP/STP (IEEE 802.1w/D) for Ethernet redundancy
- QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c, RMON supported
- SNMPv3, HTTPS, SSH, IEEE 802.1X, and port security supported
- -40 to 75˚C operating temperature (T models)
- ABC-01 (Automatic Backup Configurator) for system configuration backup

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-505A/508A/516A are standalone 5, 8, and 16-port managed Ethernet switches. With their advanced Turbo Ring technology (recovery time < 20 ms) and RSTP/STP (IEEE 802.1w/D), the EDS-505A/508A/516A switches increase the reliability and availability of your industrial Ethernet network. Models with an wide operating temperature range of -40 to 75°C are also available, and the switches support several reliable and intelligent functions, including QoS, IGMP snooping/GMRP, VLAN, Port Trunking, SNMPv1/v2c/v3, IEEE 802.1X, HTTPS, SSH, and RMON, making the EDS-505A/508A/516A switches suitable for any harsh industrial environment.

Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- Turbo Ring (recovery time < 20 ms at full load) and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- RMON for efficient network monitoring and proactive capability
- SNMPv1/v2c/v3 for different levels of network management
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Bandwidth management to prevent unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2 device, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, GMRP, LACP, RMON, HTTP, HTTPS, Telnet, Syslog (Available Soon: DHCP Option 66/67/82, SSH, SNMP Inform, Modbus/TCP, LLDP, IEEE 1588 PTP, IPv6)

MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector)

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplix mode, and auto MDI/MDI-X connection

Console Port: RS-232 (RJ45 connector)

DIP Switches: Turbo Ring, Master, Coupler, Reserve (EDS-505A/508A series only)

LED Indicators: PWR1, PWR2, FAULT, MASTER, COUPLER, 10/100M

Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC

Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
- +13 to +30V for state "1"
- -30 to +3V for state "0"
- Max. input current: 8 mA

Optical Fiber

	100BaseFX		
	Multi-mode	Single-mode	Single-mode, 80 km
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-10 dBm	0 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm
Link Budget	12 dB	29 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]	80 km [d]
Saturation	-6 dBm	-3 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant dual inputs

Input Current:
EDS-516A: 0.41 A @ 24 V
EDS-516A-MM: 0.51 A @ 24 V
EDS-505A: 0.24 A @ 24 V
EDS-508A: 0.26A @ 24 V
EDS-505A-MM/SS: 0.35 A @ 24 V
EDS-508A-MM/SS: 0.36 A @ 24 V

Overload Current Protection: Present

Connection: 2 removable 6-contact terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions:
EDS-505A/508A Series: 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)
EDS-516A Series: 94 x 135 x 142.7 mm (3.7 x 5.31 x 5.62 in)

Weight:
EDS-505A/508A Series: 1040 g
EDS-516A Series: 1586 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508, UL60950-1, CSA C22.2 No. 60950-1, EN60950-1

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C, and D (EDS-516A Series Pending); ATEX Class I, Zone 2, Ex nC IIC (EDS-516A Series Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), EDS-505A/508A: level 3; EDS-516A: level 2
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 2
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11

Maritime: DNV, GL

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time:
EDS-505A Series: 352,000 hrs
EDS-508A Series: 339,000 hrs
EDS-516A Series: 247,000 hrs

Database: Telcordia (Bellcore), GB

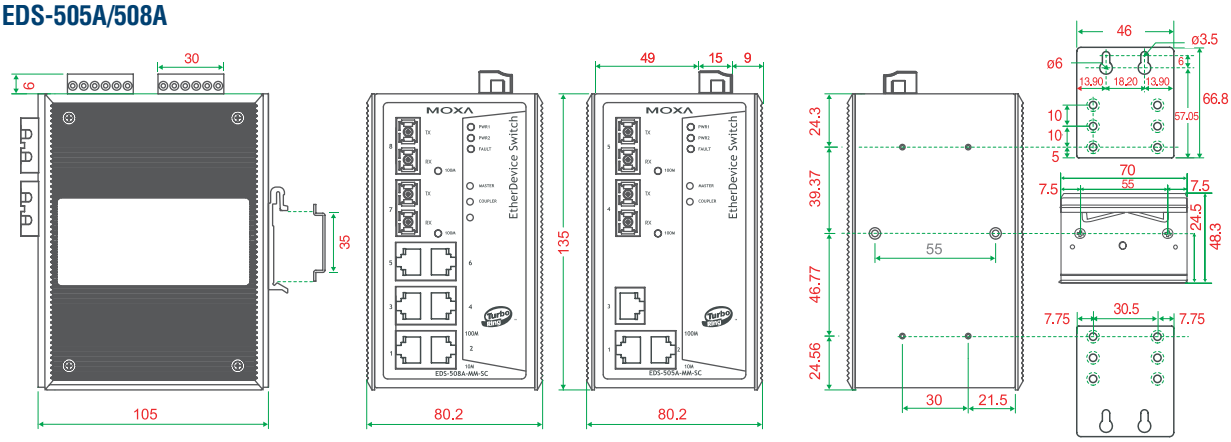
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)

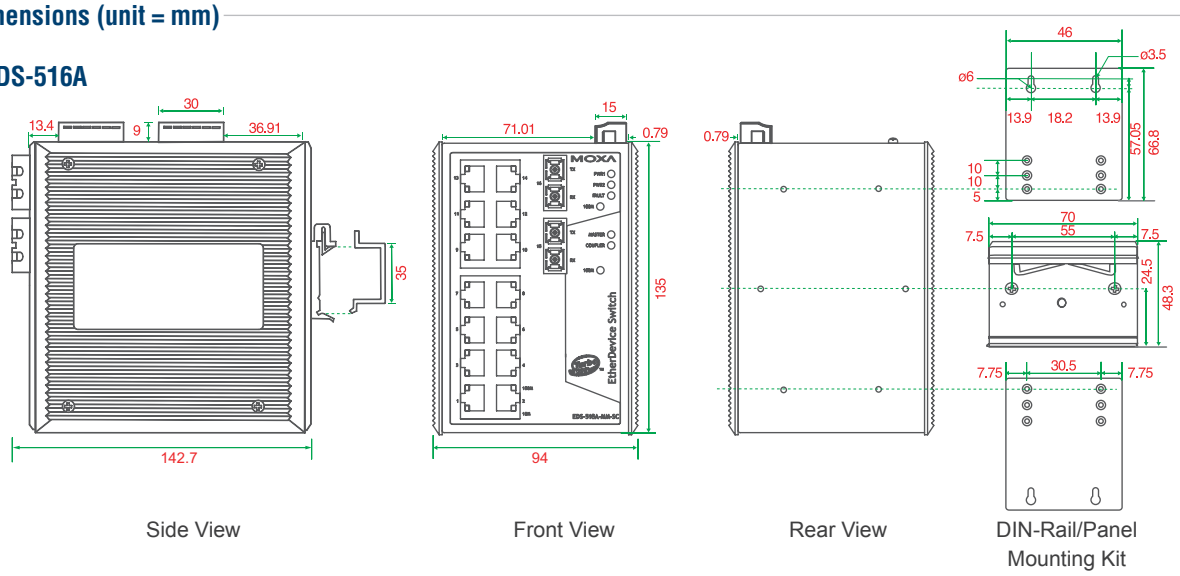
EDS-505A/508A



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Dimensions (unit = mm)

EDS-516A



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface				
			100BaseFX			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector	Single-mode, SC Connector, 80 km
EDS-505A/508A Series						
EDS-505A/508A	EDS-505A/508A-T	5/8	---	---	---	---
EDS-505A/508A-MM-SC	EDS-505A/508A-MM-SC-T	3/6	2	---	---	---
EDS-505A/508A-MM-ST	EDS-505A/508A-MM-ST-T	3/6	---	2	---	---
EDS-505A/508A-SS-SC	EDS-505A/508A-SS-SC-T	3/6	---	---	2	---
EDS-505A/508A-SS-SC-80*	EDS-508A-SS-SC-80-T	3/6	---	---	---	2
EDS-516A Series						
EDS-516A	EDS-516A	16	---	---	---	---
EDS-516A-MM-SC	EDS-516A-MM-SC-T	14	2	---	---	---
EDS-516A-MM-ST	EDS-516A-MM-ST-T	14	---	2	---	---

Note: The EDS-505A-SS-SC-80 is only available as a standard temperature model.

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

EDS-405A/408A Series

5 and 8-port entry-level managed Ethernet switches

- Plug-n-Play Turbo Ring with fast recovery time (under 20 ms)
- QoS, port-based VLAN, SNMPv1/v2c/v3, RMON supported
- Automatic warning by exception through e-mail, relay output
- User-friendly web-based configuration and management
- ABC-01 (Automatic Backup Configurator) for system configuration backup

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-405A/408A are entry-level 5 and 8-port managed Ethernet switches designed especially for industrial applications. The switches support a variety of useful management functions, such as Turbo Ring, ring coupling, port-based VLAN, QoS, RMON, bandwidth management, port mirroring, and warning by email or relay. The ready-to-use Turbo Ring can be set up easily using the web-based management interface, or with the DIP switches located on the top panel of the EDS-405A/408A switches.

Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- Plug-n-Play Turbo Ring (recovery time < 20 ms at full load) and RSTP/STP (IEEE 802.1w/D) capability
- Port-based VLAN to ease network planning
- QoS (IEEE 802.1p and TOS/DiffServ) to increase determinism
- RMON for efficient network monitoring and proactive capability
- SNMPv1/v2c/v3 for different levels of network management security
- Bandwidth management to prevent unpredictable network status
- Port mirroring for online debugging

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1p for Class of Service

Protocols: SNMPv1/v2c/v3, DHCP Server/Client, TFTP, SNTP, SMTP, RARP, RMON, HTTP, Telnet, Syslog (Available Soon: DHCP Option 66/67/82, BootP, LLDP, Modbus/TCP, IPv6)

MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector)

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplix mode, and auto MDI/MDI-X connection

Console Port: RS-232 (RJ45 connector)

DIP Switches: Turbo Ring, Master, Coupler, Reserve

LED Indicators: PWR1, PWR2, FAULT, MASTER, COUPLER, 10/100M

Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Optical Fiber

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant dual inputs

Input Current:
EDS-405A: 0.24 A @ 24 V
EDS-408A: 0.26 A @ 24 V
EDS-405A-MM/SS: 0.32 A @ 24 V
EDS-408A-MM/SS: 0.35 A @ 24 V
EDS-408A-3M/3S/2M1S/1M2S: 0.32 A @ 24 V

Overload Current Protection: Present

Connection: 1 removable 6-contact terminal block

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 53.6 x 135 x 105 mm (3.17 x 5.31 x 4.13 in)

Weight:
EDS-405A, EDS-405A-MM-SC/ST, EDS-405A-SS-SC: 650 g
EDS-408A, EDS-408A-MM-SC/ST, EDS-408A-SS-SC: 650 g
EDS-408A-3M/3S/2M1S/1M2S: 890 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508, UL60950-1, CSA C22.2 No. 60950-1, EN60950-1 (Pending*)

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C, and D (Pending*); ATEX Class I, Zone 2, Ex nC IIC (Pending*)

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11

Maritime: DNV (Pending*), GL (Pending*)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

* All models in this series except for the 3 fiber models have already received this regulatory approval. Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time:
EDS-405A Series: 392,000 hrs
EDS-408A Series: 363,000 hrs

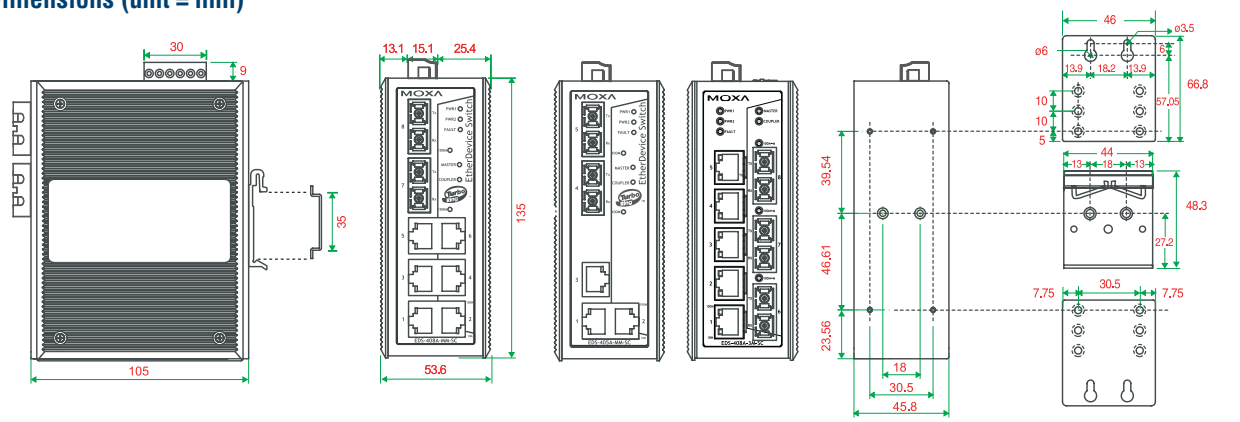
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	100BaseFX		
			Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector
EDS-405A/408A	EDS-405A/408A-T	5/8	---	---	---
EDS-405A/408A-MM-SC	EDS-405A/408A-MM-SC-T	3/6	2	---	---
EDS-405A/408A-MM-ST	EDS-405A/408A-MM-ST-T	3/6	---	2	---
EDS-408A/405A-SS-SC	EDS-408A/405A-SS-SC-T	3/6	---	---	2
EDS-408A-3M-ST	EDS-408A-3M-ST-T	5	---	3	---
EDS-408A-3S-SC	EDS-408A-3S-SC-T	5	---	---	3
EDS-408A-2M1S-SC	EDS-408A-2M1S-SC-T	5	2	---	1
EDS-408A-1M2S-SC	EDS-408A-1M2S-SC-T	5	1	---	2

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

EDS-P510 Series

7+3G-port Gigabit PoE managed Ethernet switches

- 4 IEEE 802.3af-compliant PoE and Ethernet combo ports
- Provides up to 15.4 watts at 48 VDC per PoE port
- Intelligent power consumption detection, classification, and PoE scheduling function
- 3 combo (10/100/1000BaseT(X) or 100/1000BaseSFP slot) Gigabit ports; 2 ports for redundant ring and 1 port for uplink
- Turbo Ring (recovery time < 20 ms), RSTP/STP (IEEE 802.1w/D) for Ethernet redundancy
- QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c, RMON, SNMPv3, IEEE 802.1X, HTTPS, and SSH supported

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-P510 series includes Gigabit managed redundant Ethernet switches that come standard with 4 10/100BaseT(X) 802.3af (PoE) compliant Ethernet ports and 3 combo Gigabit Ethernet ports. The EDS-P510 switches provide up to 15.4 watts of power per PoE port, and allow power to be supplied to connected devices (such as surveillance cameras, wireless access points, and IP phones) when AC power is not readily available or is cost-prohibitive to provide locally. The EDS-P510 switches are highly versatile, and their SFP fiber port can transmit data up to 80 km from the device to the control center with high EMI immunity. The Ethernet switches support a variety of management functions, including Turbo Ring, RSTP/STP, IGMP, VLAN, QoS, RMON, bandwidth management, and port mirroring. The EDS-P510 series is designed especially for security automation applications such as IP surveillance, and gate of entry systems, which can benefit from a scalable backbone construction and Power-over-Ethernet support.

Features and Benefits

- Advanced PoE management function
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- Turbo Ring (recovery time < 20 ms at full load) and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management to prevent unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output

Specifications

Technology

Standards:
IEEE 802.3af for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, Modbus/TCP (Available Soon: SNMP Inform, LLDP, IEEE 1588 PTP, IPv6)

MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

Fiber Ports: 100/1000BaseSFP slot

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed

Console Port: RS-232 (RJ45 connector)

DIP Switches: Turbo Ring, Master, Coupler, Reserve

LED Indicators: PWR1, PWR2, FAULT, 10/100/1000, 10/100, MASTER, COUPLER, PoE

Alarm Contact: 2 relay outputs with current carrying capacity of 0.5 A @ 48 VDC

Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
- +13 to +30V for state "1"
- -30 to +3V for state "0"
- Max. input current: 8 mA

Power Requirements

Input Voltage: 48 (46 to 50V) VDC, redundant dual inputs

Input Current: Max. 1.62 A @ 48 VDC (supports up to 4 ports at 15.4 W per PoE port)

Overload Current Protection: Present

Connection: 2 removable 6-contact terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)

Weight: 1170 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Operating Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508 (Pending)

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C, and D (Pending); ATEX Class I, Zone 2, Ex nC IIC (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11

Maritime: DNV (Pending), GL (Pending)

Traffic Control: NEMA TS2 (Pending)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

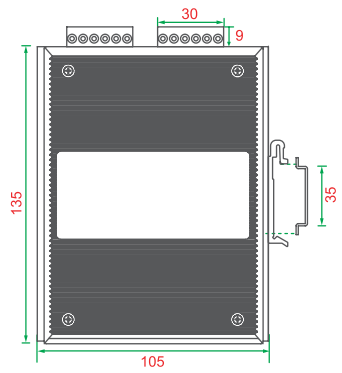
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

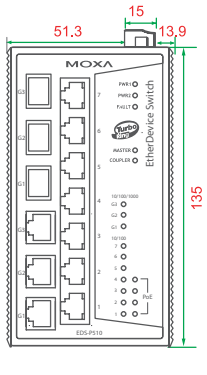
Warranty Period: 5 years

Details: See www.moxa.com/warranty

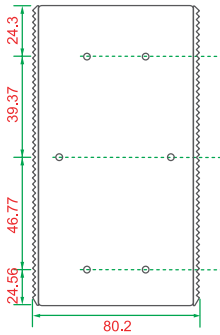
Dimensions (unit = mm)



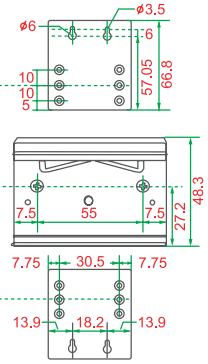
Side View



Front View



Rear View



DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface		
		Gigabit Ethernet	Fast Ethernet	
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	Combo Port, 10/100/1000BaseT(X) or 100/1000BaseSFP*	PoE, 10/100BaseT(X)	10/100BaseT(X)
EDS-P510	EDS-P510-T	3	4	3

Note: The EDS-P510 series supports up to 3 100/1000BaseSFP slots. See page 3-45 and 3-47 for SFP-1G/1FE series Gigabit/fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

SPL-24: PoE splitter, maximum output of 12.95 W at 24 VDC, 0 to 60°C operating temperature

SPL-24-T: PoE splitter, maximum output of 12.95 W at 24 VDC, -40 to 75°C operating temperature

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-75-48/120-48: 75/120 W DIN-Rail 48 VDC power supplies

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

SPL-24 Series

IEEE 802.3af PoE splitters

- IEEE 802.3af compliant; splits power and data from PoE equipment
- Supports output power up to 12.95 W at 24 VDC
- Short circuit protection for power output
- Auto disconnection if power input voltage is too high
- -40 to 75°C operating temperature range (T models)
- DIN-Rail mounting ability

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3af for Power-over-Ethernet

Interface

RJ45 Ports: 10/100BaseT(X) for PoE IN and DATA OUT

LED Indicators: Power

Power Requirements

Input Voltage: 44 to 75 VDC

Output Voltage: 24 VDC

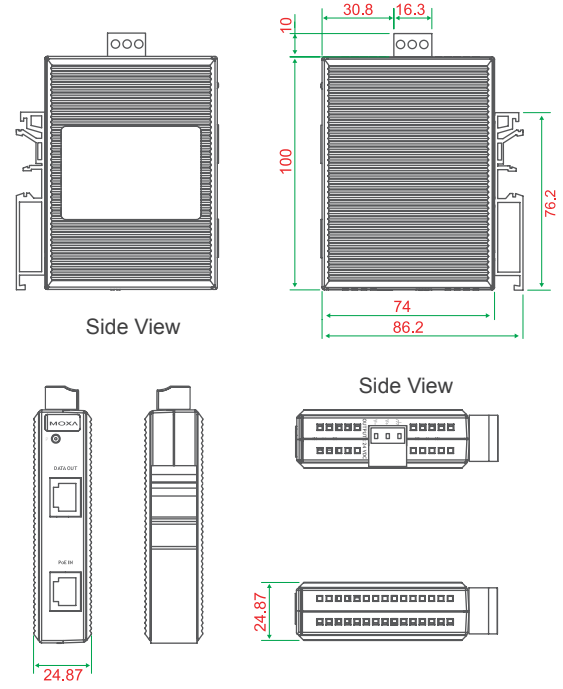
Overload Current Protection: 400 mA @ 48 VDC input

Connection: 1 removable 3-contact terminal block for output

Output Power: 12.95 W (0.54 A @ 24 VDC)

Efficiency: 85% (at 25°C, fully loaded)

Dimensions (unit = mm)



Physical Characteristics

Housing: Plastic, IP30 protection

Dimensions: 24.87 × 100 × 86.2 mm (0.98 x 3.93 x 3.39 in)

Weight: 95 g

Installation: DIN-Rail mounting

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508 (Pending)

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C, and D (Pending); ATEX Class I, Zone 2, Ex nC IIC (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time: 5,100,000 hrs

Database: MIL-HDBK-217F, GB 25°C

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Ordering Information

Available Models

SPL-24: PoE splitter, maximum output of 12.95 W at 24 VDC, 0 to 60°C operating temperature

SPL-24-T: PoE splitter, maximum output of 12.95 W at 24 VDC, -40 to 75°C operating temperature

EOM-104

4-port embedded managed Ethernet switch module

- 10/100 Mbps Ethernet Interface
- Turbo Ring, RSTP/STP for Ethernet Redundancy
- SNMP and e-mail alerts for event trapping and notification
- Two-thirds the size of a business card
- Low power consumption
- -40 to 75°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EOM-104 Ethernet switch module is designed for device manufacturers who would like to embed an Ethernet switch module in their products to enhance performance and reliability.

The EOM-104 module provides an easy and cost-effective integrated solution for adding an Ethernet switch module to an existing product.

The module supports 10/100 Mbps Fast Ethernet, and comes with Turbo Ring's fast recovery time of under 20 ms built in. The EOM-104 also provides a rich set of peripherals, such as Turbo Ring Enable and GPIO programming pins, and is an ideal solution for embedded Ethernet applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for flow control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1p for Class of service

Protocols: SNMPv1/v2c/v3, DHCP Client, BootP, TFTP, SMTP, RARP, RMON, HTTP, Telnet, Syslog

MIB: MIB-II, Ethernet-Like MIB, P-Bridge MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Interface

Ethernet Ports: 4, 10/100BaseT(X), auto MDI/MDI-X

Connectors: 1 connector with 2 x 20 pins and 2 connectors with 1 x 9 pins

Console Port: RS-232 (TxD, RxD, DTR, DSR)

GPIO: 4 programmable I/O pins

Power Requirements

Input Voltage: 3.3 V

Input Current: 0.59 A @ 3.3 V

Physical Characteristics

Dimensions: 54 x 60 x 8.25 mm (2.13 x 2.36 x 0.32 in)

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

EMI: FCC Part 15, CISPR (EN55022) class A, CE class A

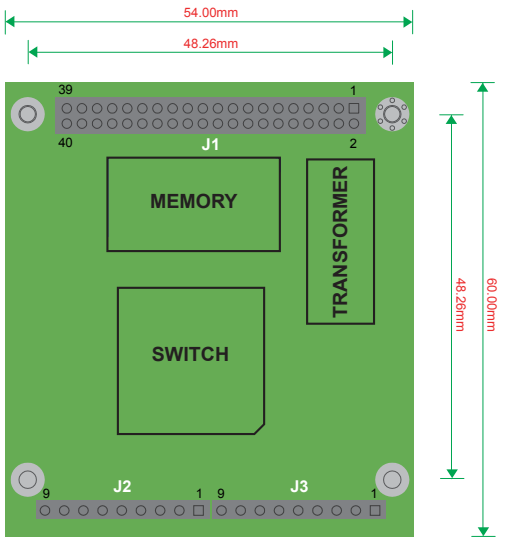
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Pin Assignment

J1 (2 x 20 connector pin assignment)

PIN	1	3	5	7	9	11	13	15	17	19
SIGNAL	TX4 -	RX4	NC	RX3 +	TX3 +	NC	GND	3.3V	GND	DTR

PIN	2	4	6	8	10	12	14	15	18	20
SIGNAL	TX4 +	RX4 +	NC	RX3	TX3	NC	GND	3.3V	GND	DSR

PIN	21	23	25	27	29	31	33	35	37	39
SIGNAL	TXD	GPIO3	GPIO1	MASTER ENABLE	MASTER LED	PORT 3 LED	PORT 1 LED	MANUAL RESET	3.3V	GND

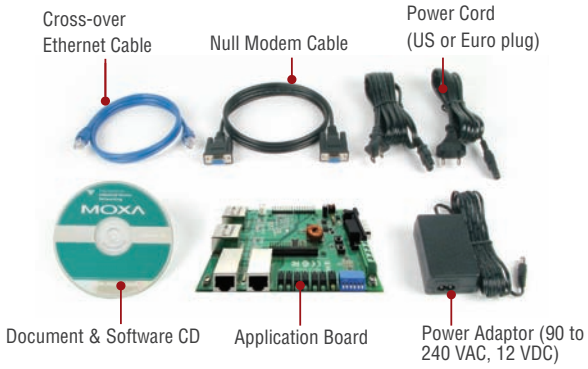
PIN	22	24	26	28	30	32	34	36	38	40
SIGNAL	RXD	GPIO2	NC GPIO0	TURBO RING ENABLE	TURBO RING LED	RESET DEFAULT	PORT 2 LED	PORT 4 LED	3.3V	GND

J2 and J3 (1 x 9 connector pin assignment)

PIN	1	2	3	4	5	6	7	8	9
SIGNAL	GND	TX +	TX	3.3V	3.3V	FXSD	RX -	RX +	GND

EOM-104 Evaluation Kit

The EOM Evaluation Kit includes an evaluation board, power adaptor, software CD, and serial and Ethernet cables to allow quick and easy evaluation of all embedded Ethernet switch functions. The evaluation board is equipped with an Ethernet port, console port, and Turbo Ring DIP switch to help you test your modules and applications.



Ordering Information

Available Models

EOM-104: 4-port embedded managed Ethernet switch module, -40 to 75°C operating temperature

SFP-1G Series

1G-port Gigabit Ethernet SFP modules

- Compliant with IEEE 802.3z
- Differential LVPECL inputs and outputs
- Single 3.3 V power supply
- TTL signal detect indicator
- Hot pluggable
- Class 1 laser product, complies with EN60825-1

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Specifications

Interface

Ethernet Ports: 1

Connectors: Duplex LC Connector or Simplex LC Connector (WDM-type only)

Note: WDM-type SFP modules must be used in pairs (e.g., SFP-1GXXALC and SFP-1GXXBLC)

Optical Fiber

	Gigabit Ethernet												
	SFP-SX	SFP-LSX	SFP-LX	SFP-LH	SFP-LHX	SFP-ZX	SFP-EZX	SFP-10A	SFP-10B	SFP-20A	SFP-20B	SFP-40A	SFP-40B
Wave-length	850 nm	1310 nm	1310 nm	1310 nm	1310 nm	1550 nm	1550 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm
Max. TX	-4 dBm	-1 dBm	-3 dBm	-2 dBm	1 dBm	5 dBm	5 dBm	-3 dBm		-2 dBm		2 dBm	
Min. TX	-9.5 dBm	-9 dBm	-9.5 dBm	-8 dBm	-4 dBm	0 dBm	0 dBm	-9 dBm		-8 dBm		-3 dBm	
RX Sensitivity	-18 dBm	-19 dBm	-20 dBm	-23 dBm	-24 dBm	-24 dBm	-30 dBm	-21 dBm		-23 dBm		-23 dBm	
Link Budget	8.5 dB	10 dB	10.5 dB	15 dB	20 dB	24 dB	30 dB	12 dB		15 dB		20 dB	
Typical Distance	550 m [a]	2 km [b]	10 km [c]	30 km [c]	40 km [c]	80 km [c]	110 km [c]	10 km [c]		20 km [c]		40 km [c]	
Saturation	0 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-1 dBm		-1 dBm		-1 dBm	

a. 50/125 µm, 400 MHz * km or 62.5/125 µm, 500 MHz * km @ 850 nm multi-mode fiber optic cable
b. 62.5/125 µm, 750 MHz * km @ 1310 nm multi-mode fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Operating Temp. Models: -40 to 85°C (-40 to 185°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

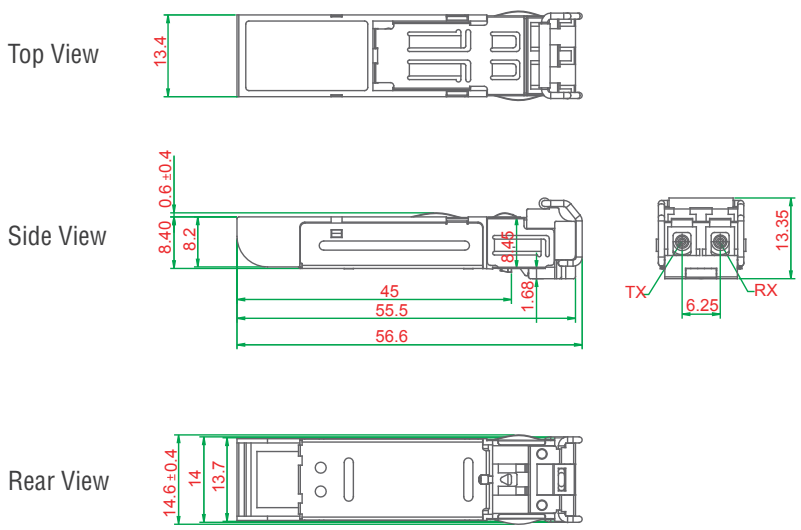
Safety: UL, TÜV

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Ordering Information

SFP Modules

Available Models		Port Interface						
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 85°C)	1000BaseSX, LC Connector, 0.5 km	1000BaseLSX, LC Connector, 2 km	1000BaseLX, LC Connector, 10 km	1000BaseLH, LC Connector, 30 km	1000BaseLHX, LC Connector, 40 km	1000BaseZX, LC Connector, 80 km	1000BaseEZX, LC Connector, 110 km
SFP-1GSXLC	SFP-1GSXLC-T*	1	---	---	---	---	---	---
SFP-1GLSXLC	SFP-1GLSXLC-T	---	1	---	---	---	---	---
SFP-1GLXLC	SFP-1GLXLC-T	---	---	1	---	---	---	---
SFP-1GLHLC	SFP-1GLHLC-T	---	---	---	1	---	---	---
SFP-1GLHXLC	SFP-1GLHXLC-T	---	---	---	---	1	---	---
SFP-1GZXLC	SFP-1GZXLC-T	---	---	---	---	---	1	---
SFP-1GEZXLC	---	---	---	---	---	---	---	1

WDM-type (BiDi) SFP Modules

Availabe Models		Port Interface					
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 85°C)	1000BaseSFP, LC Connector, 10 km		1000BaseSFP, LC Connector, 20 km		1000BaseSFP, LC Connector, 40 km	
		TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm
SFP-1G10ALC	SFP-1G10ALC-T	1	---	---	---	---	---
SFP-1G10BLC	SFP-1G10BLC-T	---	1	---	---	---	---
SFP-1G20ALC	SFP-1G20ALC-T	---	---	1	---	---	---
SFP-1G20BLC	SFP-1G20BLC-T	---	---	---	1	---	---
SFP-1G40ALC	SFP-1G40ALC-T	---	---	---	---	1	---
SFP-1G40BLC	SFP-1G40BLC-T	---	---	---	---	---	1

The SFP-1G series modules can be used with the following products

EDS-728/828 series: IM-2GSFP series Gigabit Ethernet interface modules
EDS-G509 series: 9G-port full Gigabit managed Ethernet switches
EDS-518A series: 16+2G-port Gigabit managed Ethernet switches
EDS-510A series: 7+3G-port Gigabit managed Ethernet switches
EDS-P510 series: 7+3G-port Gigabit PoE managed Ethernet switches
PT and IKS series: PM-7200-2G/4G series Gigabit Ethernet interface modules
EDS-G308 series: 8G-port full Gigabit unmanaged Ethernet switches
IMC-101G series: Industrial Gigabit media converters

SFP-1FE Series

1-port fast Ethernet SFP modules

- Single + 3.3 V power Supply
- Small From Factor Pluggable MSA Compliant
- PECL Differential Inputs and Output
- TTL Signal Detect Indicator
- Compliant with SONET / SDH Standard
- LC Duplex Connector
- EEPROM with serial ID functionality
- Class 1 Laser International Safety Standard IEC 825 Compliant

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

EN : 60825

Specifications

Interface

Ethernet Ports: 1

Connectors: Duplex LC Connector

Optical Fiber

	Fast Ethernet		
	SFP-M	SFP-S	SFP-L
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-18 dBm	0 dBm	0 dBm
Min. TX	-8 dBm	-5 dBm	-5 dBm
RX Sensitivity	-34 dBm	-34 dBm	-34 dBm
Link Budget	26 dB	29 dB	29 dB
Typical Distance	4 km [a]	40 km [b]	80 km [b]
Saturation	0 dBm	-3 dBm	-3 dBm

a. 50/125 µm or 62.5/125 µm, 800 MHz * km @ 1300 nm multi-mode fiber optic cable
b. 9/125 µm single-mode fiber optic cable

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

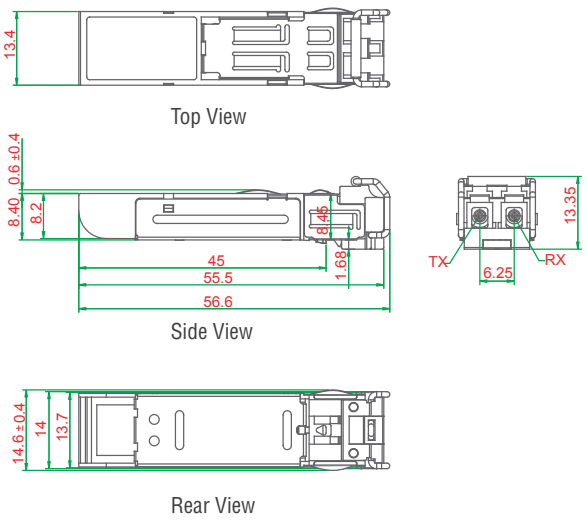
Safety: UL, TÜV

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Ordering Information

Available Models	Port Interface		
Wide Temperature (-40 to 85°C)	100BaseFX, Multi-mode, LC Connector, 4 km	100BaseFX, Single-mode, LC Connector, 40 km	100BaseFX, Single-mode, LC Connector, 80 km
SFP-1FEMLC-T	1	---	---
SFP-1FESLC-T	---	1	---
SFP-1FELLC-T	---	---	1

The SFP-1FE series modules can be used with the following products

EDS-G509 series: 9G-port full Gigabit managed Ethernet switches

EDS-G308 series: 8G-port full Gigabit unmanaged Ethernet switches

EDS-P510 series: 7+3G-port Gigabit PoE managed Ethernet switches

ABC-01

Configuration backup and restoration tool for managed switches

- Reduce system downtime, without an additional power input
- Plug-n-Play system backup and restoration
- Front label for writing identification information
- Compact, rugged, reliable design
- Supports Moxa's managed Ethernet switches

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Features

- RS-232 RJ45 console port connection
- Store the complete configuration of one switch
- Load the system configuration automatically after system reboot
- Manually load and save the system configuration through the web console
- Portable low-power design requires no power supply
- CE and FCC approval

Introduction

The ABC-01 configuration backup and restoration tool can be used to save and load the configuration of Moxa's managed Ethernet switches through the switches' RS-232 console port. This simple yet powerful tool makes it much easier to back up a switch's system parameters, or even replace an existing switch with a new switch. With the ABC-01, you can quickly re-install a substitute switch (of the same model) or recover the entire system configuration, including IP address, if a switch failure occurs.

Specifications

Basic Operation

Connector: RS-232 RJ45 port

Configuration: Use the web console of Moxa's managed switches

Power Requirements

Input Voltage: 3 to 5 VDC (through the RS-232 port's RTS signal)

Physical Characteristics

Housing: PVC molding, IP40 protection

Weight: 50 g

Dimensions: 32.5 x 97 x 12 mm (8.07 x 3.82 x 0.47 in)

On-switch Installation: M4 screw (< 4 mm)

Cable Length: 35 cm (including connector)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

Storage Temperature: -20 to 70°C (-4 to 158°F)

Ambient Relative Humidity: 5 to 95 % (non-condensing)

Regulatory Approvals

EMI: FCC Part 15, CISPR (EN55022) Class A

EMS:
EN61000-4-2 (ESD), level 2
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Ordering Information

Available Models

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

MXview Lite

Easy browser-based network management software

- Auto device discovery
- User defined topology map
- Network troubleshooting with comprehensive event logs
- Remotely accessible through user friendly web browser
- Batch deployment of configuration and firmware for Moxa network devices

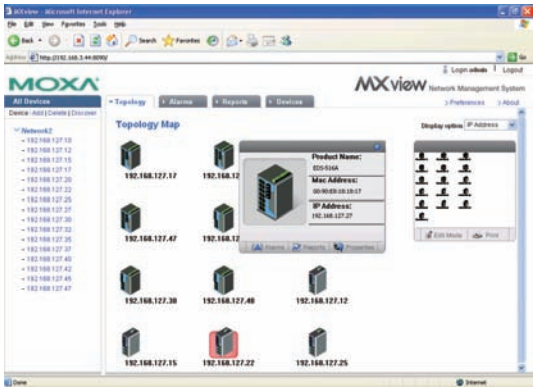
Introduction

Moxa's MXview Lite network management software is designed for configuring, monitoring, and troubleshooting Moxa network components connected to industrial Ethernet networks. MXview Lite provides an integrated management platform that can discover Moxa network components installed on multiple subnets. All selected network components can be managed graphically by web browser from both local and remote sites—anytime and anywhere.

Topology Visualization

After devices are discovered, a built-in editing tool can be used to manually draw a topology map of Moxa's managed Ethernet switches. The topology map ensures easy management and troubleshooting of your industrial Ethernet networks. Device information, such as device status and settings, will also be included on the topology map.

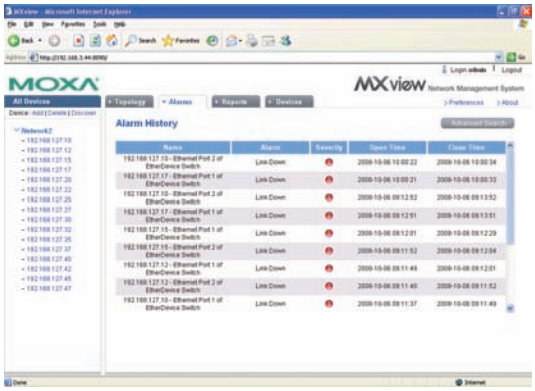
- Automatic discovery (supports searching multiple subnets)
- Manually add or delete a single Ethernet switch
- Editable topology map
- Popup menu on device thumbnail for easily configuring devices or getting device information rapidly
- Color-coded icons on the topology map indicate the status of abnormal devices



Event Management

Administrators can set up event threshold definitions. MXview Lite will use the definitions to display warning messages on a monitor, or the messages will be sent to network administrators via email. The alarm information is recorded in a database, which users can check to keep the network running smoothly.

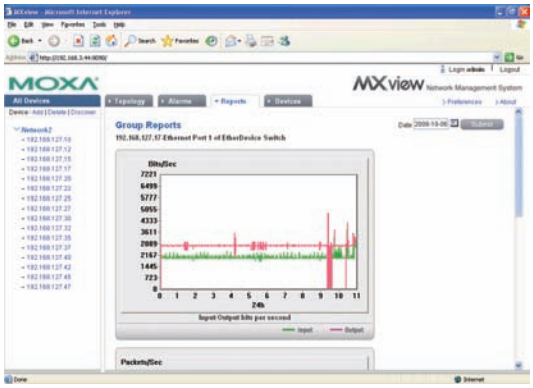
- Notification based on an event, including SNMP failure, link down, bandwidth utilization, packet error rate, and collision rate
- Notification can be sent via email
- Event threshold can be defined by the administrator
- Alarm history list and advance search function of the event log
- Color-coded icons for real-time status



Traffic Monitoring

MXview Lite generates port-based traffic statistics for selected ports on the network components. The statistics can be viewed graphically in a chart, and the statistics for two different ports can be displayed on the same page for easy network analysis.

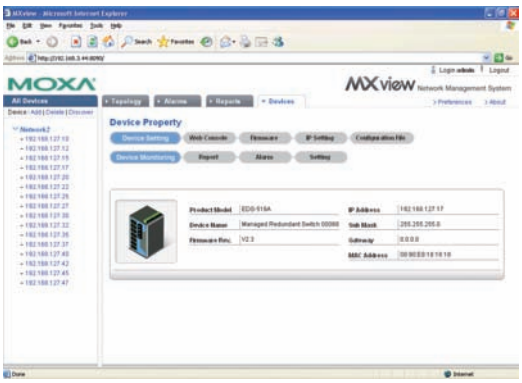
- Network traffic statistics for Moxa's managed Ethernet switches
- Multiple statistics charts can be displayed on a single page



Device Configurations

MXview Lite is an integrated tool that can manage a group of Moxa Ethernet switches over industrial Ethernet networks. Updating firmware for a group of Ethernet switches using a single tool is now possible using MXview Lite. The individual configuration file for each Ethernet switch can be stored and deployed when the Moxa Ethernet switch is replaced during maintenance, reducing system downtime.

- 100% configuration of Moxa switches by web console
- Centralized firmware deployment for Moxa's managed Ethernet switches
- Restore and deploy configuration files over the network



System Requirements

Software Requirements	
CPU	Intel Core 2 Duo 2.4 GHz or above
RAM	1G or above
Hard Disk Space	1G or above
Hardware Requirements	
Operating System	Windows XP Professional/2000/2003
Browser	IE 6.0 or higher
Language Support	
User interface and user's manual	English

Ordering Information

Available Models

MXview Lite: Browser-based network management software that supports monitoring 32 units of Moxa's managed Ethernet switches

Note: Registered users of Moxa's managed Ethernet switches can download MXview Lite for free from from Moxa's website.

EDS-SNMP OPC Server Pro

OPC server for integrating SNMP devices into HMI/SCADA systems

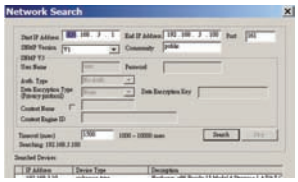
Seamlessly integrate EDS-SNMP OPC Server Pro with the leading HMI/SCADA software to create a comprehensive Ethernet network management solution for SNMP devices.

Introduction

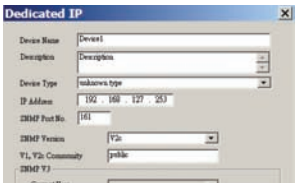
Moxa's EDS-SNMP OPC Server Pro provides a user-editable Tag file for any SNMP device. Use the default MIB file, or create and edit a standard or private MIB to generate a dedicated Tag file. This powerful function lets operators use an existing HMI software environment to create a customized and real time view of the integrity of all Ethernet network devices, the overall Ethernet network traffic volume, and overall Ethernet network status. Moxa's managed Ethernet switches are ideally suited for connecting Ethernet-enabled industrial devices in your mission critical applications. Combined with EDS-SNMP OPC Server Pro software, your HMI (Human Machine Interface) packages and SCADA (Supervisory Control And Data Acquisition) software will be turned into a complete remote network traffic and status monitoring tool. This solution gives control engineers the power to monitor the network from a central location with existing and familiar visualization and control applications.

Features and Benefits

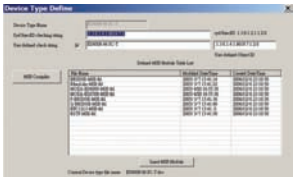
- "Broadcast Search" the network for Moxa's managed Ethernet switches and any SNMP device



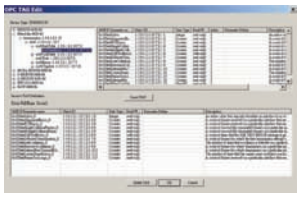
- Easy to create and edit the configuration of connected devices in advance



- Easy to create and edit the MIB Template for dedicated tag file of any SNMP device



- User-definable tag file meets the requirements of many different applications



System Requirements

Windows NT/2000/XP, Administrator Privileges, Ethernet Card

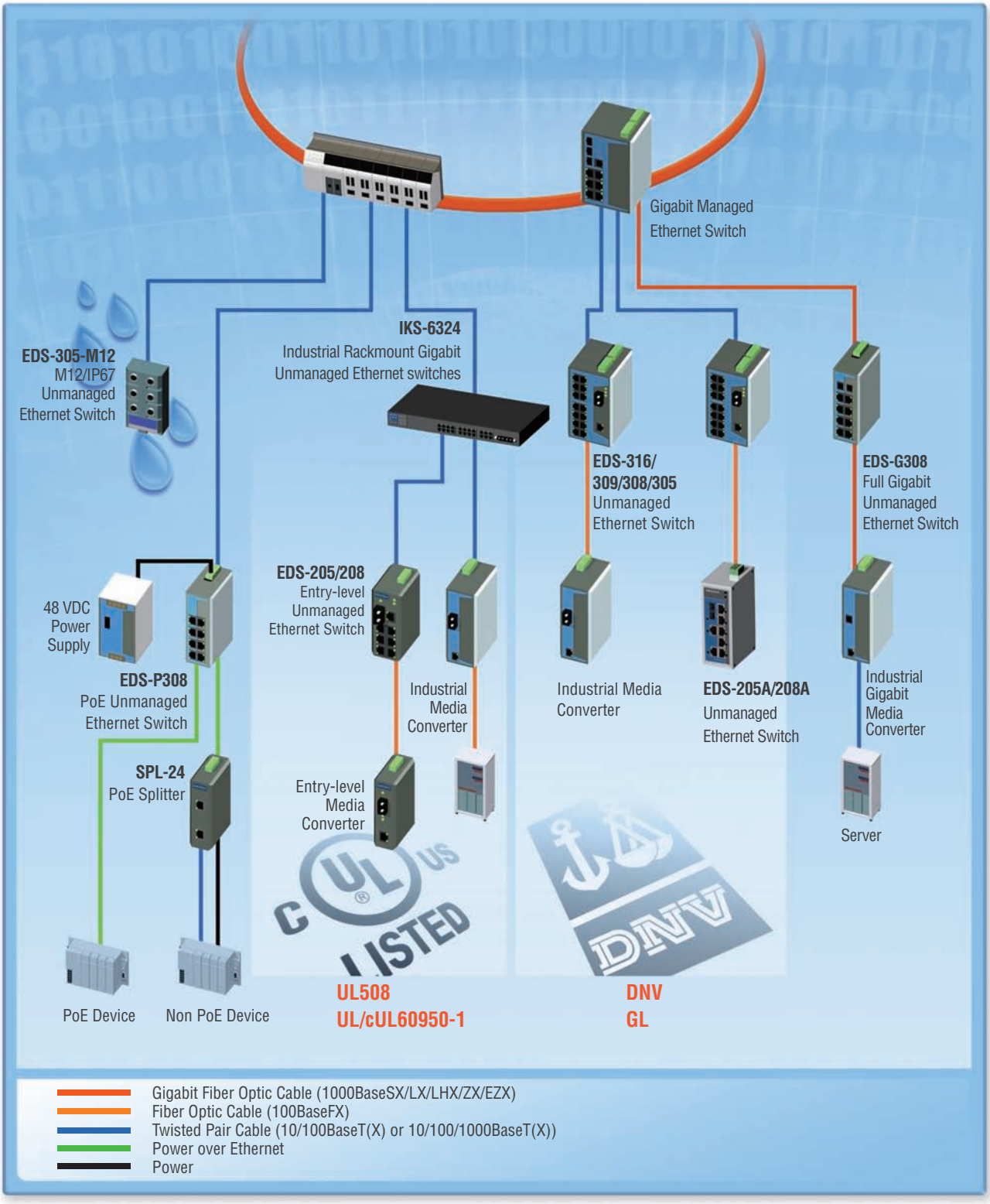
Ordering Information

Available Models

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

Introduction to Unmanaged Ethernet Switches

Adapted for Any Tough Environment

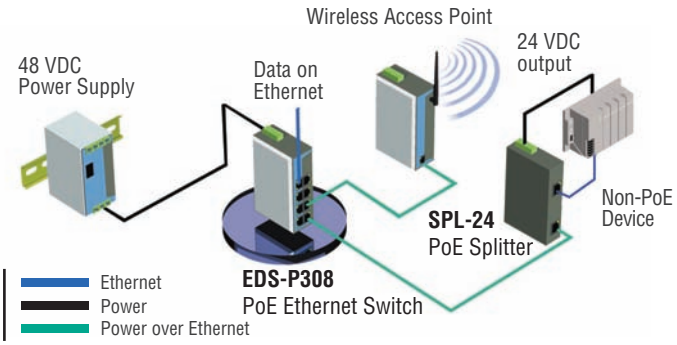


Certified to Meet Industrial Reliability Standards

Industrial environments often involve unknown, hazardous factors that can influence the operation of Ethernet devices. In fact, some of the factors could cause serious disasters or the loss of life and property. Many of Moxa's industrial products have received UL508 and UL60950-1 certifications, which were developed to indicate which industrial control and information technology equipment is suitable for hazardous locations such as maritime environments, mines, oil refineries, and other industrial settings. In addition, UL/cUL Class I Division 2, ATEX C1Z2, and DNV and GL maritime type approvals have strict standards for testing and determining which devices can be used safely and reliably in these critical environments.

Power-over-Ethernet Solutions

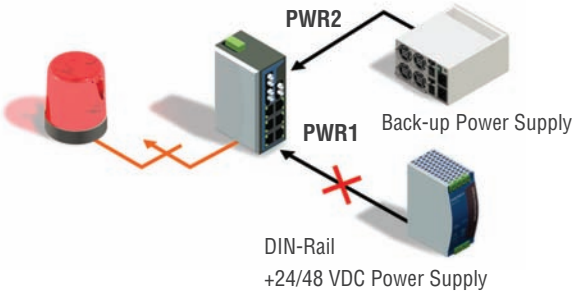
Moxa provides solutions for any IEEE 802.3af PoE compliant unit and Ethernet-enabled device. The EDS-P308 series of unmanaged Ethernet switches and the SPL-24 PoE splitter can be used to simplify wiring in the field and provide a more versatile environment for installing devices. The devices can be placed up to 328 feet (100 m) from a PSE.



Advanced Features for Enhanced Reliability and Operation

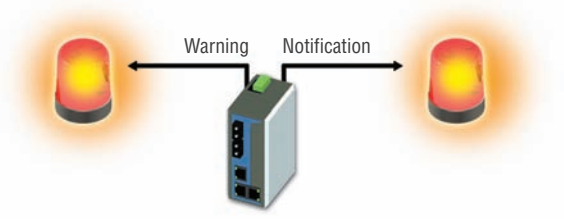
Redundant Power Inputs

The IKS-6324, EDS-200A, EDS-305, EDS-308, EDS-309, EDS-316, EDS-G205, EDS-G308, and EDS-P308 unmanaged Ethernet switches provide two power inputs that can be connected simultaneously to live DC power sources. If one of the power inputs fails, the other live source acts as a backup to provide the Ethernet switch's power needs automatically.



Relay Output Alarm for Port Breaks, Power Failure

The EDS-305, EDS-308, EDS-309, EDS-316, EDS-G205, EDS-G308, and EDS-P308 unmanaged Ethernet switches provide relay contact outputs to warn technicians on the shop floor when the power fails or a port link breaks, so that they can respond quickly with appropriate emergency operation procedures.



Broadcast Storm Protection

Moxa's unmanaged Ethernet switches are protected from receiving too many broadcast packets. During normal use, broadcast packets will be forwarded to all ports except the source port. However, unmanaged Ethernet switches will discard broadcast or multicast packets if the number of those packets exceeds a threshold in a preset period of time. When the preset time period expires, the switch will then resume receiving broadcast or multicast packets until the threshold is reached again.

VLAN Tag Packets Transmitted Transparently

The IEEE 802.1Q standard defines a VLAN tag that includes TPID control (information) with an additional 4 bytes inserted into an untagged Ethernet frame. Moxa's unmanaged Ethernet switches can transmit and receive these data packets without modifying the packets in any way.

AC or DC Power Input Options

The EDS-200A/200 unmanaged Ethernet switches allow users to use either a 24 VDC or 24 VAC power input. The 24 VAC power input is specially designed for applications in the building automation field where the power input source is often restricted. The EDS-200A/200 Ethernet switches are low-cost, versatile solutions suitable for all industrial applications.

Comparison Chart for Unmanaged Ethernet Switches

	Port Interface				Features				Approvals			
Model	Total Number of Ports	Gigabit Ethernet (10/100/1000 Mbps)	Fast Ethernet (10/100 Mbps)	PoE, Fast Ethernet (10/100 Mbps)	Alarm Contact	Power Redundancy	-40 to 75°C	UL/cUL 60950-1	UL508	EN50155/EN50121-4	UL/cUL Class I, Div. 2/ ATEX Class I, Zone 2	DNV/GL
Rackmount Unmanaged Ethernet Switches												
IKS-6324	24	2	24	---	---	√	√	P	---	√	---	P
DIN-Rail Unmanaged Ethernet Switches												
EDS-G308	8	8	---	---	√	√	√	---	P	---	P	P
EDS-G205	5	5	---	---	√	√	√	---	P	---	P	P
EDS-P308	8	---	4	4	√	√	√	---	√	---	P	P
EDS-316	16	---	16	---	√	√	√	√	√	---	P	√
EDS-309	9	---	9	---	√	√	√	√	√	---	√	√
EDS-308	8	---	8	---	√	√	√	√	√	---	√	√
EDS-305	5	---	5	---	√	√	√	√	√	---	√	√
EDS-208A	8	---	8	---	---	√	√	---	√	---	P	P
EDS-205A	5	---	5	---	---	√	√	---	√	---	P	P
EDS-208	8	---	8	---	---	---	---	√	√	---	---	---
EDS-205	5	---	5	---	---	---	---	---	√	---	---	---

√ = Available, P = Pending, Note: Please check Moxa's website for the most up-to-date certification status.

IKS-6324 Series

22+2G-port Gigabit unmanaged Ethernet switches

- Meets UL 60950-1, NEMA TS2, EN50155/EN50121-4, and DNV/ GL certifications
- Universal power supply range, 12/24/48 VDC or 110/220 VDC/VAC
- Redundant dual 12/24/48 VDC power inputs
- -40 to 75°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The IKS-6324 industrial rackmount Ethernet switches are designed to meet the demands of industrial application networks such as traffic control systems (NEMA TS2), and maritime applications (DNV/ GL). The IKS-6324 is a 24-port industrial 19" rackmount Ethernet switch series that provides a rugged and economical solution for your industrial Ethernet connections. Up to two fast Ethernet fiber optic ports and combo Gigabit Ethernet TP or fiber optic ports can be chosen to make the construction of a reliable Ethernet network easy. A universal power supply range of 12/24/48 VDC or 110/220 VDC/VAC give users greater flexibility in choosing power inputs. The Ethernet switches comply with UL standards and support a wide operating temperature range of -40 to 75°C. All models undergo a 100% burn-in test to ensure that they fulfill the special needs of industrial automation control applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3x for Flow Control

Flow Control: IEEE 802.3x flow control, back pressure flow control

Interface

Fiber Ports: 100BaseFX (SC/ST connector) or 1000BaseSFP slots

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode and auto MDI/MDI-X connection

LED Indicators: STAT, PWR1, PWR2, FAULT, LNK/ACT, FDX/HDX, SPEED

Note: Slot 1 is for a 2-port PM-7200 Gigabit Ethernet combo module, or 1 or 2-port PM-7200 fast Ethernet module. See page 4-31 for details.

Power Requirements

Input Voltage: 12/24/48 VDC (9 to 60 V), or 110/220 VDC/VAC (88 to 300 VDC and 85 to 264 VAC)

Input Current: (all ports are equipped with fiber)
- Max. 0.68 A @ 24 VDC
- Max. 0.35 A @ 48 VDC
- Max. 0.17/0.11 A @ 110/220 VDC
- Max. 0.33/0.23 A @ 110/220 VAC

Overload Current Protection: Present

Connection: 10-contact terminal block

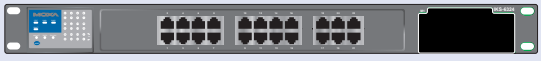
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 440 x 44 x 254 mm (17.32 x 1.73 x 10.00 in)

Unmanaged Rackmount Ethernet Switch System, IKS-6324



Weight: 4300 g

Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL60950-1, CSA C22.2 No. 60950-1, EN60950-1 (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

Maritime: DNV (Pending), GL (Pending)

Traffic Control: NEMA TS2 (Pending)

Rail Traffic: EN50155/EN50121-4

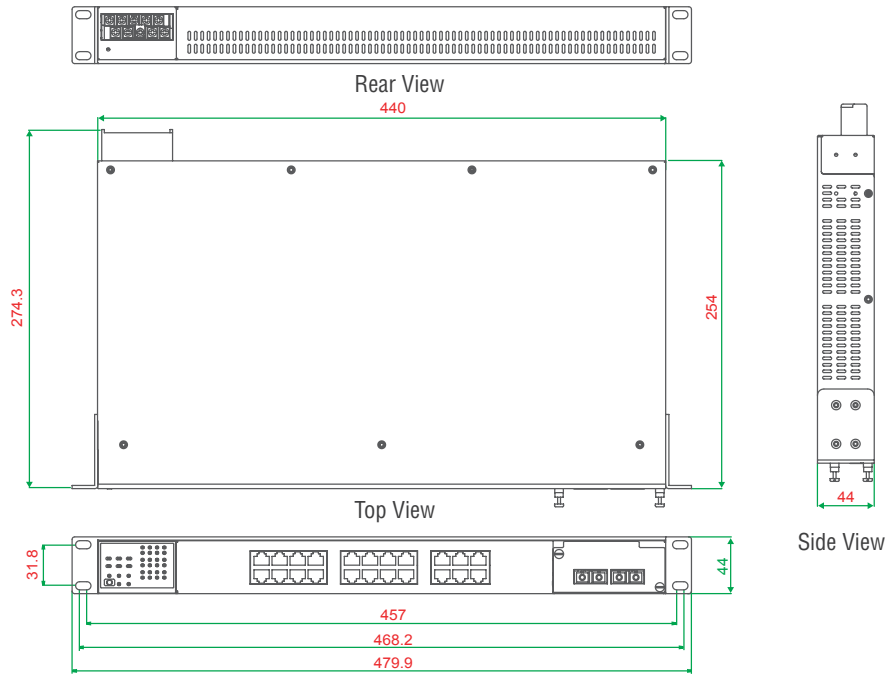
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Ordering Information

Step 1: Select Ethernet switch system

IKS-6324 with power supply

Step 2: Select interface modules

PM-7200 modules
(Gigabit or fast Ethernet)

Note: The IKS-6324 Ethernet switch system is delivered without interface modules. Please see page 4-31 to determine which PM-7200 interface modules are suitable for your application.

IKS-6324 Unmanaged Rackmount Ethernet Switch System

The IKS-6324 switch system consists of 2 unmanaged rackmount Ethernet switch systems with 22 10/100BaseT(X) ports, and 1 slot for fast Ethernet or Gigabit Ethernet modules. A total of up to 24 or 22+2G ports can be installed, and the switch can be used in a temperature range from -40 to 75°C.

Product Model	Power Supply	
Front Cabling, Front Display	LV: 12/24/48 VDC (9 to 60 V)	HV: 88 to 300 VDC and 85 to 264 VAC, isolated
IKS-6324-F-LV-T	1	---
IKS-6324-F-HV-T	---	1

Gigabit/Fast Ethernet Module Compatibility Chart for the IKS-6324

	Interface Module						
	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-1SSC	PM-7200-2MSC	PM-7200-2MST	PM-7200-2SSC
Slot 1	√	√	√	√	√	√	√

EDS-G205/G308 Series

5G and 8G-port full Gigabit unmanaged Ethernet switches

- Fiber optic options for extending distance and electrical noise immunity (EDS-G308 series)
- Redundant dual 12/24/48 VDC power inputs
- Relay output warning for power failure and port break alarm
- Broadcast storm protection
- -40 to 75°C operating temperature range (T models)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-G205 and EDS-G308 switches are equipped with 5 and 8 Gigabit Ethernet ports, respectively, and up to 2 fiber optic ports, making them ideal for applications that demand high bandwidth. The EDS-G205/G308 switches provide an economical solution for your industrial Gigabit Ethernet connections, and the built-in relay warning function alerts network managers when power failures or port breaks occur. Two models are available in this series. One model has an operating temperature range of 0 to 60°C, and the other model has an extended operating temperature range of -40 to 75°C. Both models undergo a 100% burn-in test to ensure that they fulfill the special needs of industrial automation control applications. The EDS-G205/G308 switches can be installed easily on a DIN-Rail or in distribution boxes.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX/EZX
IEEE 802.3x for Flow Control

Processing Type: Store and Forward

Flow Control: IEEE 802.3x flow control, back pressure flow control

Interface

Fiber Ports: 100/1000BaseSFP slot (EDS-G308 series only)

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

DIP Switches: One for port break alarm, one for Enable/Disable broadcast storm protection

LED Indicators: PWR1, PWR2, FAULT, 10/100/1000M

Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Power Requirements

Input Voltage: 12/24/48 VDC (9.6 to 60 VDC), redundant inputs

Input Current:
EDS-G205: 0.20 A @ 24 V
EDS-G308: 0.32 A @ 24 V
EDS-G308-2SFP: 0.34 A @ 24 V

Connection: 1 removable 6-contact terminal block

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions:
EDS-G205: 35 x 130 x 105 mm (1.37 x 5.12 x 4.13 in)
EDS-G308: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)

Weight:
EDS-G205: 290 g
EDS-G308: 630 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508 (Pending)

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C, and D (Pending); ATEX Class I, Zone 2, Ex nC IIC (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3

Maritime: DNV (Pending), GL (Pending)
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

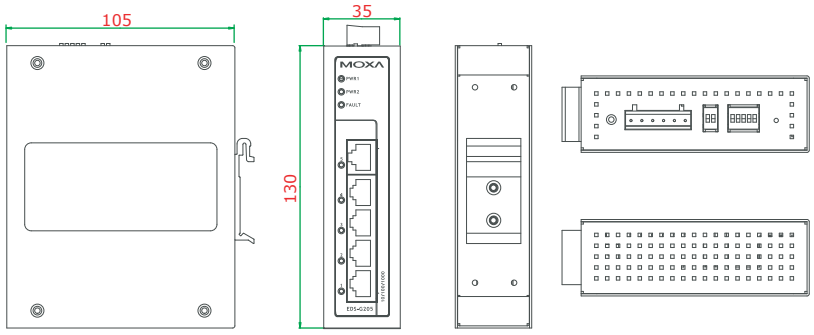
Time: 325,000 hrs (EDS-G308 series)
Database: Telcordia (Bellcore), GB (EDS-G308 series)

Warranty

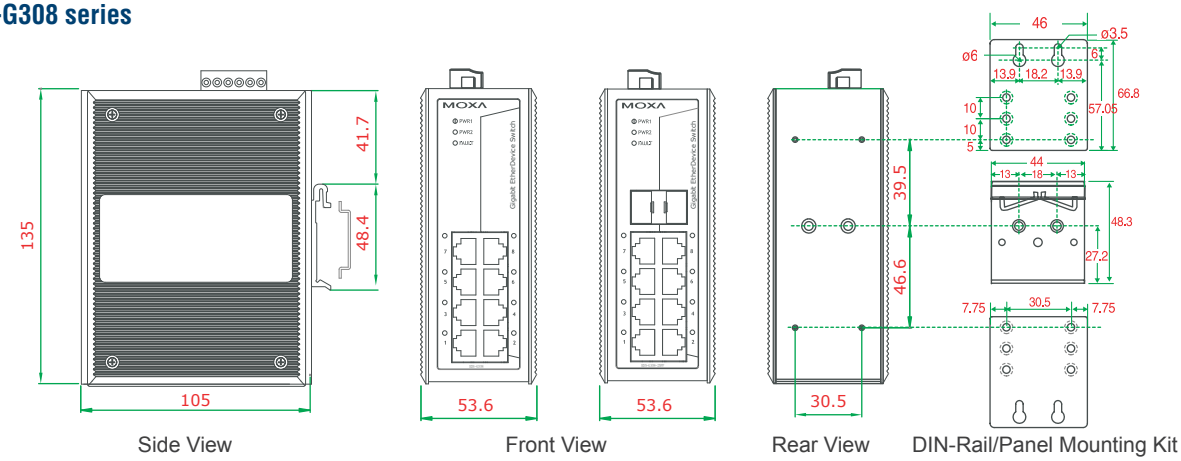
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions (unit = mm)

EDS-G205



EDS-G308 series



Ordering Information

Product Model		Port Interface	
		Gigabit Ethernet	
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000BaseT(X)	Combo port, 10/100/1000BaseT(X) or 100/1000BaseSFP*
EDS-G205	EDS-G205-T	5	---
EDS-G308	EDS-G308-T	8	---
EDS-G308-2SFP	EDS-G308-2SFP-T	6	2

Note: The EDS-G308-2SFP and EDS-G308-2SFP-T support up to 2 100/1000BaseSFP slots. See pages 3-45 and 3-47 for SFP-1G/1FE series Gigabit/fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-46: Wall mounting kit (EDS-G308 series only)
WK-30: Wall mounting kit (EDS-G205 series only)
RK-4U: 4U-high 19" rack mounting kit

EDS-305/308/309/316 Series

5, 8, 9, and 16-port unmanaged Ethernet switches

- Redundant dual 24 VDC power inputs
- Relay output warning for power failure and port break alarm
- Broadcast storm protection
- Transparent transmission of VLAN tagged packets
- -40 to 75°C operating temperature range (T models)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-305/308/309/316 are 5, 8, 9, and 16-port Ethernet switches that provide an economical solution for your industrial Ethernet connections. The built-in relay warning function alerts network engineers when power failures or port breaks occur, and the switches are designed for harsh industrial environments, such as in hazardous locations (Class I, Div. 2/ATEX). The switches comply with FCC, TÜV, UL, and CE standards, and come in two model types. Standard operating temperature range models (0 to 60°C) and wide operating temperature range models (-40 to 75°C). Both models undergo a 100% burn-in test to ensure that they fulfill the special needs of industrial automation control applications. The EDS-305/308/309/316 switches can be installed easily on a DIN-Rail or in a distribution box.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3x for Flow Control

Processing Type: Store and Forward

Flow Control: IEEE 802.3x flow control, back pressure flow control

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector)

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

DIP Switches: Port break alarm mask

LED Indicators: PWR1, PWR2, FAULT, 10/100M (TP port), 100M (fiber port)

Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Optical Fiber

	100BaseFX		
	Multi-mode	Single-mode	Single-mode, 80 km
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-10 dBm	0 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm
Link Budget	12 dB	29 dB	29 dB
Typical Distance	5 km, 2 km (EDS-316-T)[a]	40 km [c]	80 km [d]
	4 km, 2 km (EDS-316-T)[b]		
Saturation	-6 dBm	-3 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Power Requirements

Input Voltage:
EDS-305/308: 24 VDC (12 to 48 VDC), redundant inputs
EDS-309/316: 24 VDC (12 to 45 VDC), redundant inputs

Input Current:
EDS-305: 0.13 A @ 24 V
EDS-305-M/S: 0.17 A @ 24 V
EDS-308: 0.13 A @ 24 V
EDS-308-M/S: 0.21 A @ 24 V
EDS-308-MM/SS: 0.26 A @ 24 V
EDS-309-3M: 0.31 A @ 24 V
EDS-316: 0.27 A @ 24 V
EDS-316-M/S/MM/SS/MS: 0.44 A @ 24 V

Overload Current Protection:
EDS-305, EDS-305-M, EDS-305-S, EDS-308: 1.1 A
EDS-308-M/S/MM/SS, EDS-309 series, EDS-316 series: 1.6 A

Connection: 1 removable 6-pin terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions:
EDS-305/308/309 Series:
53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
EDS-316 Series:
80.5 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)

Weight:
EDS-305/308/309 Series: 630 g
EDS-316 Series: 1140 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety:
EDS-305/308/309 Series: UL508, UL60950-1, CSA C22.2 No. 60950-1, EN60950-1
EDS-316 series: UL508, UL60950-1, EN60950-1

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C and D (EDS-316 Series Pending); ATEX Class I, Zone 2, Ex nC IIC (EDS-316 Series Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), EDS-305/308: level 2; EDS-309/316: level 3

Maritime: DNV, GL

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time:
EDS-305 series: 422,000 hrs
EDS-308 series: 255,000 hrs
EDS-309 series: 396,000 hrs
EDS-316 series: 257,000 hrs

Database: MIL-HDBK-217F, GB 25°C

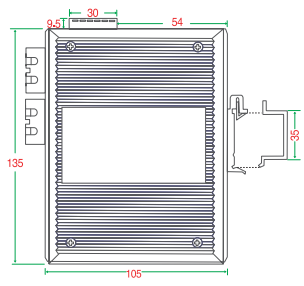
Warranty

Warranty Period: 5 years

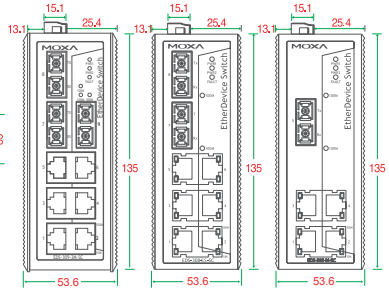
Details: See www.moxa.com/warranty

Dimensions (unit = mm)

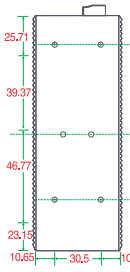
EDS-305/308/309 Series



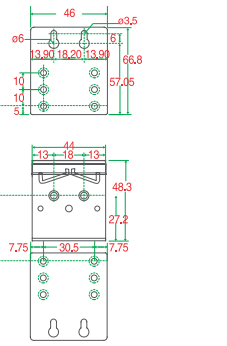
Side View



Front View

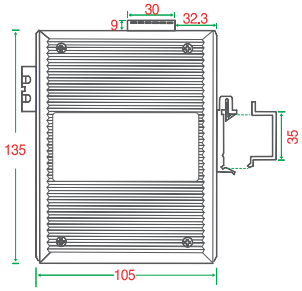


Rear View

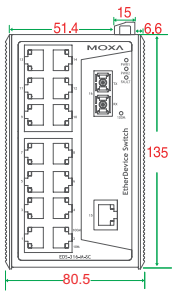


DIN-Rail/Panel Mounting Kit

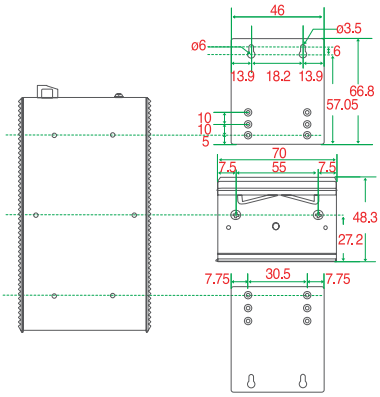
EDS-316 Series



Side View



Front View



Rear View DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface				
			100BaseFX			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector	Single-mode, SC Connector, 80 km
EDS-305 Series						
EDS-305	EDS-305-T	5	---	---	---	---
EDS-305-M-SC	EDS-305-M-SC-T	4	1	---	---	---
EDS-305-M-ST	EDS-305-M-ST-T	4	---	1	---	---
EDS-305-S-SC	EDS-305-S-SC-T	4	---	---	1	---
EDS-305-S-SC-80	---	4	---	---	---	1
EDS-308 Series						
EDS-308	EDS-308-T	8	---	---	---	---
EDS-308-M-SC	EDS-308-M-SC-T	7	1	---	---	---
EDS-308-MM-SC	EDS-308-MM-SC-T	6	2	---	---	---
EDS-308-MM-ST	EDS-308-MM-ST-T	6	---	2	---	---
EDS-308-S-SC	EDS-308-S-SC-T	7	---	---	1	---
EDS-308-SS-SC	EDS-308-SS-SC-T	6	---	---	2	---
EDS-308-S-SC-80	EDS-308-S-SC-80-T	7	---	---	---	1
EDS-308-SS-SC-80	EDS-308-SS-SC-80-T	6	---	---	---	2
EDS-309 Series						
EDS-309-3M-SC	EDS-309-3M-SC-T	6	3	---	---	---
EDS-309-3M-ST	EDS-309-3M-ST-T	6	---	3	---	---
EDS-316 Series						
EDS-316	EDS-316-T	16	---	---	---	---
EDS-316-M-SC	EDS-316-M-SC-T	15	1			---
EDS-316-M-ST	EDS-316-M-ST-T	15	---	1	---	---
EDS-316-MM-SC	EDS-316-MM-SC-T	14	2	---	---	---
EDS-316-MM-ST	EDS-316-MM-ST-T	14	---	2	---	---
EDS-316-MS-SC	EDS-316-MS-SC-T	14	1	---	1	---
EDS-316-S-SC	EDS-316-S-SC-T	15	---	---	1	---
EDS-316-SS-SC	EDS-316-SS-SC-T	14	---	---	2	---
EDS-316-MS-SC-80	---	14	1	---	---	1
EDS-316-S-SC-80	---	15	---	---	---	1
EDS-316-SS-SC-80	---	14	---	---	---	2
EDS-316-SS-SC-40/80	---	14	---	---	1	1

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

EDS-205A/208A Series

5 and 8-port unmanaged Ethernet switches

- 10/100BaseT(X) (RJ45 connector), 100BaseFX (multi/single-mode, SC or ST connector)
- Redundant dual 12/24/48 VDC, 18 to 30 VAC power inputs
- IP30 aluminum housing
- Rugged hardware design well suited for hazardous locations (Class I Div. 2 /ATEX) and maritime environments (DNV/GL)
- -40 to 75°C operating temperature range (T models)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-205A/208A series are 5 and 8-port industrial Ethernet switches that support IEEE 802.3 and IEEE 802.3u/x with 10/100M full/half-duplex, MDI/MDI-X auto-sensing. The EDS-205A/208A switches provide 12/24/48 VDC (9.6 to 60 VDC), 18 to 30 VAC redundant power inputs that can be connected simultaneously to live AC/DC power sources. These switches have been designed for harsh industrial environments, such as in maritime (DNV/GL) or hazardous locations (Class I Div. 2/ATEX) that comply with FCC, TUV, UL, and CE standards.

The EDS-205A/208A switches are available with a standard operating temperature range from -10 to 60°C, or with a wide operating temperature range from -40 to 75°C. All models are subjected to a 100% burn-in test to ensure that they fulfill the special needs of industrial automation control applications. In addition, the EDS-205A/208A switches have DIP switches for enabling or disabling broadcast storm protection, providing another level of flexibility for industrial applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control

Processing Type: Store and Forward

Flow Control: IEEE 802.3x flow control, back pressure flow control

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector, multi-mode, single-mode)

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection

DIP Switches: Enable/Disable broadcast storm protection

LED Indicators: Power, 10/100M (TP port), 100M (fiber port)

Optical Fiber

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Power Requirements

Input Voltage: 12/24/48 VDC (9.6 to 60 VDC), 18 to 30 VAC (47 to 63 Hz), redundant dual inputs

Input Current:
EDS-205A: 0.091 A @ 24 V
EDS-208A: 0.13 A @ 24 V
EDS-208A-M: 0.17 A @ 24 V
EDS-208A-MM/SS: 0.22 A @ 24 V

Overload Current Protection: 1.1 A

Connection: 1 removable 4-contact terminal block

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum, IP30 protection

Dimensions:
EDS-205A: 30 x 115 x 70 mm (1.18 x 4.52 x 2.76 in)
EDS-208A: 50 x 115 x 70 mm (1.96 x 4.52 x 2.76 in)

Weight:
EDS-205A: 175 g
EDS-208A: 275 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C and D (Pending); ATEX Class I, Zone 2, Ex nC IIC (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11

Maritime: DNV (Pending), GL (Pending)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time: 425,000 hrs

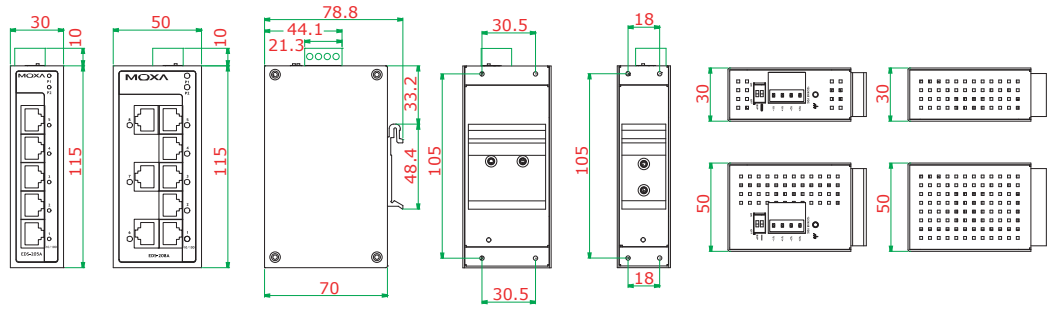
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Front Views | Side View | Rear Views | Top & Bottom Views

Ordering Information

Available Models		Port Interface			
			100BaseFX		
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector
EDS-205A	EDS-205A-T	5	---	---	---
EDS-208A	EDS-208A-T	8	---	---	---
EDS-208A-M-SC	EDS-208A-M-SC-T	7	1	---	---
EDS-208A-M-ST	EDS-208A-M-ST-T	7	---	1	---
EDS-208A-MM-SC	EDS-208A-MM-SC-T	6	2	---	---
EDS-208A-MM-ST	EDS-208A-MM-ST-T	6	---	2	---
EDS-208A-S-SC	EDS-208A-S-SC-T	7	---	---	1
EDS-208A-SS-SC	EDS-208A-SS-SC-T	6	---	---	2

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-46: Wall mounting kit (EDS-208A series only)

WK-30: Wall mounting kit (EDS-205A series only)

RK-4U: 4U-high 19" rack mounting kit

EDS-205/208 Series

5 and 8-port entry-level unmanaged Ethernet switches

- 10/100BaseT(X) (RJ45 connector), 100BaseFX (multi-mode, SC/ST connectors)
- IEEE802.3/802.3u/802.3x support
- Broadcast storm protection
- DIN-Rail mounting ability
- -10 to 60°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-205/208 series of industrial Ethernet switches are entry-level industrial 5 and 8-port Ethernet switches that support IEEE 802.3/802.3u/802.3x with 10/100M, full/half-duplex, MDI/MDIX auto-sensing RJ45 ports. The EDS-205/208 switches are rated to operate at temperatures ranging from -10 to 60°C, and are rugged enough for any harsh industrial environment. The switches can be easily installed on a DIN-Rail as well as in distribution boxes. The DIN-Rail mounting capability, wide operating temperature, and the the IP30 housing with LED indicators make the plug-and-play EDS-205/208 switches easy to use and reliable.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control

Processing Type: Store and Forward

Flow Control: IEEE 802.3x flow control, back pressure flow control

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector, multi-mode)

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection

LED Indicators: Power, 10/100M (TP port), 100M (fiber port)

Optical Fiber

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Power Requirements

Input Voltage:
EDS-205: 12 to 48 VDC, 18 to 30 VAC (47 to 63 Hz)
EDS-208 series: 12 to 45 VDC, 18 to 30 VAC (47 to 63 Hz)

Input Current:
EDS-205: 0.12 A @ 24 V
EDS-208: 0.14 A @ 24 V
EDS-208-M: 0.23 A @ 24 V

Overload Current Protection: 1.1 A

Connection: 1 removable 3-contact terminal block

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Plastic, IP30 protection

Dimensions:
EDS-205: 25 x 100 x 74 mm (0.98 x 3.94 x 2.91 in)
EDS-208: 40 x 100 x 74 mm (1.57 x 3.94 x 2.91 in)

Weight:
EDS-205: 135 g
EDS-208: 170 g

Installation: DIN-Rail mounting

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety:
EDS-205: UL508
EDS-208: UL508, UL60950-1

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 2
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), EDS-205: level 3; EDS-208: level 2
EN61000-4-8
EN61000-4-11

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time:
EDS-205: 323,000 hrs
EDS-208: 368,000 hrs

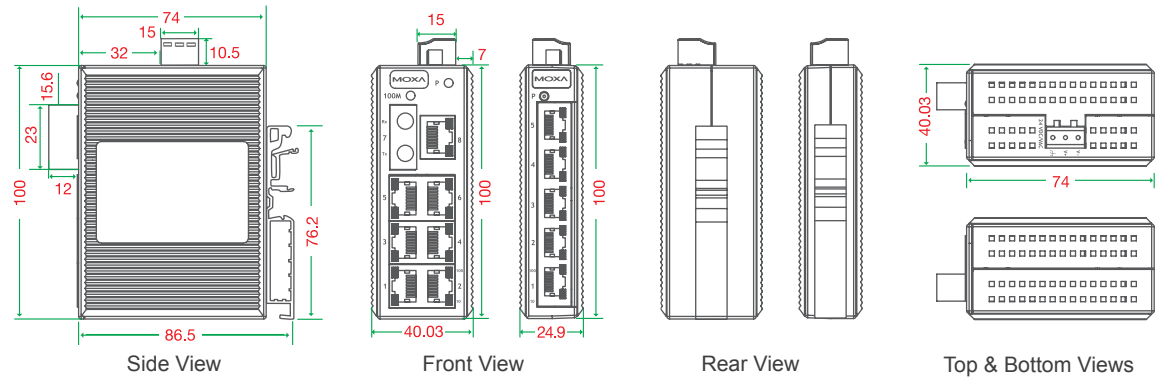
Database:
EDS-205: Telcordia (Bellcore), GB
EDS-208: MIL-HDBK-217F, GB 25°C

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Side View | Front View | Rear View | Top & Bottom Views

Ordering Information

Available Models	Port Interface			Housing Material	Power Range
Standard Temperature (-10 to 60°C)	10/100BaseT(X)	100BaseFX			
		Multi-mode, SC Connector	Multi-mode, ST Connector		
EDS-205	5	---	---	Plastic	12 to 48 VDC
EDS-208	8	---	---	Plastic	12 to 45 VDC
EDS-208-M-SC	7	1	---	Plastic	12 to 45 VDC
EDS-208-M-ST	7	---	1	Plastic	12 to 45 VDC

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

RK-4U: 4U-high 19" rack mounting kit

EDS-P308 Series

8-port IEEE 802.3af PoE unmanaged Ethernet switches

- 4 IEEE 802.3af compliant PoE and Ethernet combo ports
- Up to 15.4 watts at 48 VDC per PoE port
- Intelligent power consumption detection and classification
- Redundant dual VDC power inputs
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-P308 switches are smart, 8-port, unmanaged Ethernet switches supporting PoE (Power-over-Ethernet) on ports 1 to 4. The switches are classified as power source equipment (PSE), and when used in this way, the EDS-P308 switches enable centralization of the power supply and provide up to 15.4 watts of power per port. The switches can be used to power IEEE 802.3af compliant powered devices (PD), eliminating the need for additional wiring, and support IEEE 802.3/802.3u/802.3x with 10/100M, full/half-duplex, MDI/MDI-X auto-sensing to provide an economical solution for your industrial Ethernet network. In addition, the built-in relay warning function alerts network engineers when power failures or port breaks occur.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.3af for Power-over-Ethernet

Processing Type: Store and Forward

Flow Control: IEEE 802.3x flow control, back pressure flow control

Interface

Fiber Ports: 100BaseFX ports (SC connector)

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

DIP Switches: Port break alarm mask

LED Indicators: PWR1, PWR2, FAULT, 10/100M, PoE

Alarm Contact: 1 relay output with current carrying capacity of 0.5 A @ 48 VDC

Optical Fiber

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Power Requirements

Input Voltage: 48 (46 to 50 V) VDC, redundant inputs

Input Current: 1.6 A @ 48 V

Overload Current Protection: 2.5 A @ 48 VDC

Connection: 1 removable 6-contact terminal block

Reverse Polarity Protection: Present

PoE (per port)

Max. Output Power: 15.4 W

Output Voltage: 44 to 48.5 VDC

Max. Output Current: 350 mA

Max. Overload Protection: 400 mA

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 53.6 × 135 × 105 mm (2.11 x 5.31 x 4.13 in)

Weight: 840 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C, and D (Pending); ATEX Class I, Zone 2, Ex nC IIC (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 4
EN61000-4-5 (Surge), level 4
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11

Maritime: DNV (Pending), GL (Pending)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time: 360,000 hrs

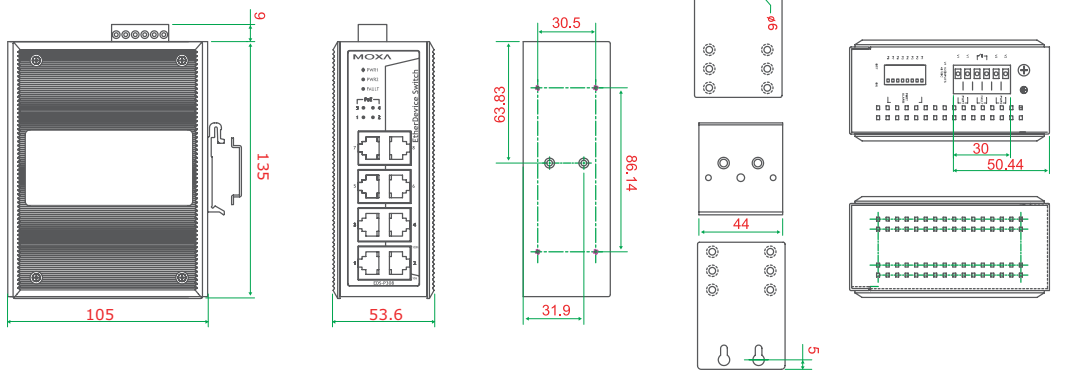
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit | Top and Bottom Views

Ordering Information

Available Models		Port Interface			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	PoE, 10/100BaseT(X)	100BaseFX	
				Mulit-mode, SC Connector	Single-mode, SC Connector
EDS-P308	EDS-P308-T	4	4	---	---
EDS-P308-M-SC	EDS-P308-M-SC-T	3	4	1	---
EDS-P308-S-SC	EDS-P308-S-SC-T	3	4	---	1
EDS-P308-MM-SC	EDS-P308-MM-SC-T	2	4	2	---
EDS-P308-SS-SC	EDS-P308-SS-SC-T	2	4	---	2

Optional Accessories (can be purchased separately)

SPL-24: PoE splitter, maximum output of 12.95 W at 24 VDC, 0 to 60°C operating temperature (see page 3-42 for details)

SPL-24-T: PoE splitter, maximum output of 12.95 W at 24 VDC, -40 to 75°C operating temperature (see page 3-42 for details)

DR-75-48/120-48: 75W/120W DIN-Rail 48 VDC power supplies

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

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Industry-specific Ethernet Switches

Product Selection Guides

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M12 Ethernet Switches

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IEC 61850-3 Rackmount Ethernet Switches

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PT-7828 Series 24+4G-port Layer 3 Gigabit modular managed rackmount Ethernet switches 4-20
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PM-7200 Series Gigabit and fast Ethernet modules for PT and IKS series switches . . . 4-31

M12 Ethernet Switches

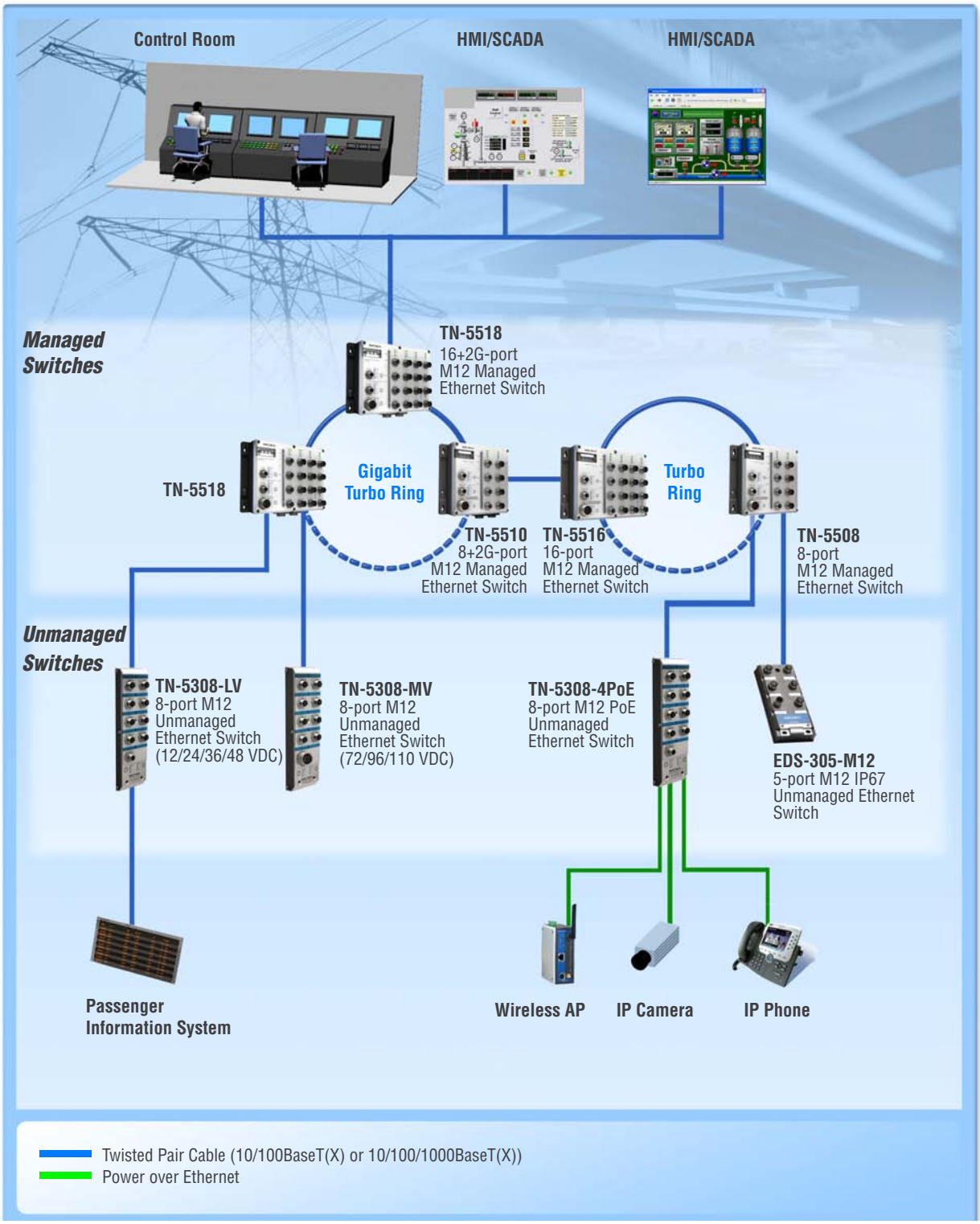
	TN-5508 Series	TN-5510 Series	TN-5516 Series	TN-5518 Series	TN-5308 Series	TN-5308-PoE Series	EDS-305-M12 Series
Number of Ports							
Max. Number of Ports	8	10	16	18	8	8	5
Gigabit Ethernet, 10/100/1000 Mbps	---	2	---	2	---	---	---
Fast Ethernet, 10/100 Mbps	8	8	16	16	8	8 (4 PoE)	5
Power Supply							
12/24/36/48 VDC	√	√	√	√	√ (LV Model)	---	---
72/96/110 VDC	√	√	√	√	√ (MV Model)	---	---
80-300 VDC, 85-264 VAC	√	√	√	√	---	---	---
24 VDC	---	---	---	---	---	---	√
48 VDC	---	---	---	---	---	√	---
24 VAC	---	---	---	---	---	---	√
Installation Options							
DIN-Rail Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Panel Mounting	√	√	√	√	√	√	√
Operating Temperature							
0 to 60°C	√	√	√	√	√	√	√
-40 to 75°C	√	√	√	√	√	√	√
Redundancy and Backup Options							
Turbo Ring (Recovery Time < 20 ms)	√	√	√	√	---	---	---
STP/RSTP	√	√	√	√	---	---	---
Network Management and Control							
IPv6	√	√	√	√	---	---	---
DHCP Option 66/67/82	√	√	√	√	---	---	---
IEEE 1588 PTP	√	√	√	√	---	---	---
LLDP	√	√	√	√	---	---	---
Modbus/TCP	√	√	√	√	---	---	---
IGMP/GMRP	√	√	√	√	---	---	---
Port Trunking	√	√	√	√	---	---	---
IEEE 802.1X	√	√	√	√	---	---	---
Port Lock	√	√	√	√	---	---	---
SNMP/RMON	√	√	√	√	---	---	---
VLAN	√	√	√	√	---	---	---
QoS	√	√	√	√	---	---	---
Relay Warning	√	√	√	√	---	---	---
Regulatory Approvals							
CE/FCC	√	√	√	√	√	√	√
UL508	Pending	Pending	Pending	Pending	Pending	Pending	√
Traffic Control Systems: NEMA TS2 e1	 Pending Pending	 Pending Pending	 Pending Pending	 Pending Pending	 Pending Pending	 Pending Pending	 --- ---
Railway Applications: EN50155 EN50121-3-2 EN50121-4	 Pending Pending Pending	 Pending Pending Pending	 Pending Pending Pending	 Pending Pending Pending	 Pending Pending Pending	 Pending Pending Pending	 √ Pending Pending
DNV/GL	---	---	---	---	---	---	Pending

IEC 61850-3 Rackmount Ethernet Switches

	PT-7828	PT-7728	PT-7710	PT-7324
Supported Modules				
Gigabit Ethernet Modules	√	√	√	√
Fast Ethernet Modules	√	√	√	√
SFP Gigabit Ethernet Modules	√	√	√	√
SFP Fast Ethernet Modules	√	√	√	---
Number of Ports				
Max. Number of Ports	28	28	10	24
Gigabit Ethernet, 10/100/1000 Mbps	Up to 4	Up to 4	Up to 2	Up to 2
Fast Ethernet, 10/100 Mbps	Up to 24	Up to 24	Up to 10	Up to 24
Power Supply				
24 VDC, isolated	√	√	---	---
48 VDC, isolated	√	√	---	---
12/24/48 VDC	---	---	√	√
88-300 VDC or 85-264 VAC, isolated	√	√	√	√
Installation Options				
Rack Mounting	√	√	√	√
Panel Mounting	---	---	√	---
Operating Temperature				
-40 to 85°C	√	√	√	√
Redundancy and Backup Options				
Turbo Ring (Recovery Time < 20 ms)	√	√	√	---
STP/RSTP	√	√	√	---
Automatic Backup Configurator (ABC-01)	√	√	√	---
Network Management and Control				
Layer 3 Switching	√	---	---	---
IPv6	---	√	√	---
DHCP Option 66/67/82	√	√	√	---
IEEE 1588 PTP	√	√	√	---
LLDP	√	√	√	---
Modbus/TCP	√	√	√	---
IGMP/GMRP	√	√	√	---
Port Trunking	√	√	√	---
IEEE 802.1X	√	√	√	---
Port Lock	√	√	√	---
SNMP/RMON	√	√	√	---
VLAN	√	√	√	√
QoS	√	√	√	√
Relay Warning	√	√	√	√
Regulatory Approvals				
CE/FCC	√	√	√	√
UL/cUL 60950-1	Pending	Pending	Pending	Pending
IEC 61850-3 (Power Substation)	√	√	√	√
IEEE 1613 (Power Substation)	√	√	√	√
NEMA TS2 (Traffic Control System)	√	√	√	√
EN50155/EN50121-4 (Railway Applications)	√	√	√	√
DNV/GL	Pending	Pending	Pending	Pending

Introduction to M12 Shielded Ethernet Switches

Building Tough Networks for any Harsh Industrial Environment



Robust M12 Solution for Industry-specific Applications

Ethernet devices used in harsh industrial environments must be able to withstand extreme environmental conditions and provide robust data communication. Industrial settings are often subject to vibration, shock, dust, fluid, and extreme temperatures. Moxa's ToughNet TN series of M12 Ethernet switches can be used to ensure stable and tough network connections. With ToughNet switches, you can rest assured that your network will meet the stringent design requirements needed for applications in factories, trains, buses, ships, and other moving vehicles.

M12 Connectors | M23 Connector | Circular RJ45 Connector

M12 and Circular Connectors

Moxa's ToughNet series of Ethernet switches use tight M12 connectors and other types of circular connectors to ensure robust connections and reliable operation when subjected to environmental disturbances such as vibration and shock. The M12 4-pin connector with D-coding has already been defined as an Industrial Ethernet standard according to IEC 61067-2-101 Amendment 1. The ToughNet switches support fast Ethernet twisted-pair cables with M12 connectors or Gigabit Ethernet twisted-pair cables with circular RJ45 connectors.

Rugged Metal Housing

Moxa's ToughNet series of Ethernet switches have a metal housing that can sustain mechanical stress and protects the switches against electromagnetic disturbances.

Fanless Operation in a Wide (-40 to 75°C) Temperature Range

The wide temperature (T) models of the TN series of M12 Ethernet switches are guaranteed to operate reliably in extreme temperatures ranging from -40 to 75°C, and the switches' fanless design is suitable for harsh environments.

Suitable for Diverse Requirements

Reliable Gigabit Ethernet Bypasses Device Failure

The TN-5510/5518 series of M12 Ethernet switches provide 2 Gigabit Ethernet ports with relay bypass function. The bypass function ensures reliable data communication even if the device fails to work due to a power failure. This avoids SPOF (single point of failure) to assure continuous system operation. The Gigabit ports are suitable for the Ethernet backbone of an industrial network, and the large bandwidth allows applications such as video surveillance and VoIP (Voice-over-Internet-Protocol).

Large Choice of Power Input Ranges

To satisfy global power requirements for various industrial applications, the TN-5500 series managed switches provide isolated dual redundant power inputs with universal 12/24/36/48 VDC, 72/96/110 VDC, or 110/220 VDC/VAC power supply range. For example, the TN-5516-LV-MV switches support the wide power input range of 12/24/36/48/72/96/110 VDC that fit most railway applications. In addition, the TN-5308-LV switches provide a 7 to 60 VDC power supply range that allows stable operations, even when using a 12 VDC battery. The TN-5308-MV switches provide a 72/96/110 VDC (50.4 to 154 VDC) power supply range that is suitable for different applications.

Robust M12 Power-over-Ethernet Solution

The TN-5308-4PoE switches have M12 IEEE 802.3af compliant PoE ports that make the devices act as power source equipment (PSE), which means that the switches can transmit data and power through the same cable to IEEE 802.3af compliant powered devices (PD), such as IP cameras and wireless access points, making it easier to wire your applications.

Hardware-based IP Address Configuration for Faulty Device Replacement

The rapid replacement of faulty devices is critical for systems that must continue operating around the clock. One way to achieve this is to make it much easier to configure the new device that replaces the faulty one. The TN-5500 series switches, for example, have rotary switches for configuring the IP address built right into the switch's housing, allowing you to recover your network communication in no time.

Moxa's Products are Certified to Meet Industrial Standards

Railway Application Standards

EN50155

EN50155 addresses the conditions of operation, design, construction, and testing of electronic equipment used on rail vehicles (rolling stock) in railway applications. The ToughNet series of M12 Ethernet switches are compliant with both the performance tests and environmental tests dictated by EN50155. Reliable performance can be assured under different power supply conditions, such as voltage variations, power interruption, supply change over, and other conditions. The switches can also withstand environmental disturbances such as vibration, shock, and temperature variations.

EN50121-3-2

EN50121-3-2 defines the electromagnetic compatibility (EMC) of an apparatus installed on rolling stock in railway applications. The TN series switches are compliant with this standard.

EN50121-4

EN50121-4 defines the emission and immunity standards for a signaling and telecommunications apparatus. The TN series switches are EN50121-4 compliant.

Road Traffic Control System Standards

NEMA TS2

The National Electrical Manufacturers Association (NEMA) established the TS1 standard to define technically adequate and safe traffic control equipment. The TS2 standard was later introduced to overcome the limitations of TS1. Section 2 contains the environmental and testing requirements, including guidelines for temperature, humidity, voltage, vibration, and shock. The TN series switches are compliant with the NEMA TS2 traffic control system standards.

e1

Compliance with the EU's Automotive EMC Directive (95/54/EC) is indicated by the "e" mark, which is fitted to a vehicle's sub-assembly. Moxa's TN series switches meet the EMC requirements of this directive.

M12 Ethernet Switches Comparison Chart

	Port Interfaces					Features													Certifications			
Model	Total Number of Ports	Gigabit Ethernet (10/100/1000 Mbps)	Fast Ethernet (10/100 Mbps)	PoE, Fast Ethernet (10/100 Mbps)	Isolated Redundant Power	IPv6	IEEE 1588 PTP	DHCP Option 82	Turbo Ring and RSTP/STP	IGMP Snooping/GMRP	VLAN/GVRP	QoS	Port Trunking/LACP	IEEE 802.1X/HTTPS/SSH	SNMP/RMON	Port Lock	IP67	UL508	EN50155/EN50121-3-2/EN50121-4	NEMA TS2	e1
TN-5508	8	---	8	---	√	√	√	√	√	√	√	√	√	√	√	√	---	P	P	P	P
TN-5510	10	2	8	---	√	√	√	√	√	√	√	√	√	√	√	√	---	P	P	P	P
TN-5516	16	---	16	---	√	√	√	√	√	√	√	√	√	√	√	√	---	P	P	P	P
TN-5518	18	2	16	---	√	√	√	√	√	√	√	√	√	√	√	√	---	P	P	P	P
TN-5308-LV	8	---	8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	P	P	P	P
TN-5308-MV	8	---	8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	P	P	P	P
TN-5308-4PoE	8	---	4	4	---	---	---	---	---	---	---	---	---	---	---	---	---	P	P	P	P
EDS-305-M12	5	---	5	---	---	---	---	---	---	---	---	---	---	---	---	---	√	P	√	P	P

√ = Available P = Pending

Coming Soon

TN-5508/5510/5516/5518 Series

Preliminary

8, 8+2G, 16, 16+2G-port M12 managed Ethernet switches

- M12 connectors for robust links
- Wide power input range from 12 to 110 VDC (LV-MV model)
- Isolated redundant power inputs with universal 12/24/36/48 VDC, 72/96/110 VDC, or 110/220 VDC/VAC power supply range
- 2-port flexibility of Gigabit Ethernet ports with relay bypass function
- EN50155/50121-3-2/50121-4, NEMA TS2, and e1 compliant
- -40 to 75°C operating temperature range (T models)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The ToughNet TN-5500 series M12 managed Ethernet switches are designed for industrial applications in harsh environments. The TN series switches use M12 and other circular connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. The TN-5500-LV-MV switches provide the wide power input range of 12/24/36/48/72/96/110 VDC that allows you to use only one model in global applications. In addition, the 12/24/36/48 VDC, 72/96/110 VDC, or 110/220 VDC/VAC dual, isolated redundant power supply increases the reliability of your communications and saves on cabling/wiring costs. The TN-5500 switches provide up to 8 or 16 fast Ethernet M12 ports, and TN-5510/5518 switches provide 2 ports on the down side to provide the Gigabit Ethernet RJ45 interface with a relay bypass function. Models with an extended operating temperature range of -40 to 75°C are also available. The TN-5500 series Ethernet switches are compliant with EN50155/50121-3-2/50121-4 (railway applications), NEMA TS2 (traffic control systems), and e1 (vehicles) requirements, making the switches suitable for a variety of industrial applications.

Features and Benefits

- Relay bypass function on the 2 Gigabit Ethernet RJ45 ports to ensure data communication even if the device fails to work due to a power failure
- Three rotary switches for setting the last 3 digits of the IP address makes maintenance even easier
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring and RSTP/STP (IEEE802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port allows access by only authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, and Windows utility
- Panel mounting or DIN-Rail mounting installation capability

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2C/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telent, SSH, Syslog, LLDP, IEEE 1588 PTP, Modbus/TCP, IPv6

MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

Gigabit Ethernet: Down cabling, circular field connector (RJ45 inside), 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, auto MDI/MDI-X connection, with relay bypass function

Console Port: M12 A-coding 5-pin male connector

System LED Indicators: PWR1, PWR2, FAULT, MASTER, COUPLER

Port LED Indicators: 10/100M (fast Ethernet port), 10/100/1000M (Gigabit Ethernet port)

Alarm Contact: 2 relay outputs in one M12 A-coding 5-pin male connector with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Rotary Switches: For setting the last 3 digits of the IP address

Power Requirements

Input Voltage:
- 12/24/36/48 VDC (8.4 to 60 VDC)
- 72/96/110 VDC (50.4 to 154 VDC)
- 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)

Overload Current Protection: Present

Connection: M23 A-coding, 5-pin male connector

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP54 protection

Dimensions:
TN-5508 Series: 185 x 170 x 69.8 mm (7.28 x 6.69 x 2.75 in)
TN-5510 Series: 185 x 183 x 69.8 mm (7.28 x 7.20 x 2.75 in)
TN-5516 Series: 250 x 170 x 69.8 mm (9.84 x 6.69 x 2.75 in)
TN-5518 Series: 250 x 183 x 69.8 mm (9.84 x 7.20 x 2.75 in)

Installation: Panal mounting, DIN-Rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Operating Humidity: 5 to 95% RH (non-condensing)

Regulatory Approvals

Safety: UL508 (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), Level 3
EN61000-4-3 (RS), Level 4
EN61000-4-4 (EFT), Level 3
EN61000-4-5 (Surge), Level 3
EN61000-4-6 (CS), Level 3
EN61000-4-8
EN61000-4-11
EN61000-4-12

Traffic Control: NEMA TS2 (Pending), e1 (Pending)

Rail Traffic: EN50155 (Environmental, Pending), EN50121-3-2 (Pending), EN50121-4 (Pending)

Shock: IEC61373

Freefall: IEC60068-2-32

Vibration: IEC61373

Note: Please check Moxa's website for the most up-to-date certification status.

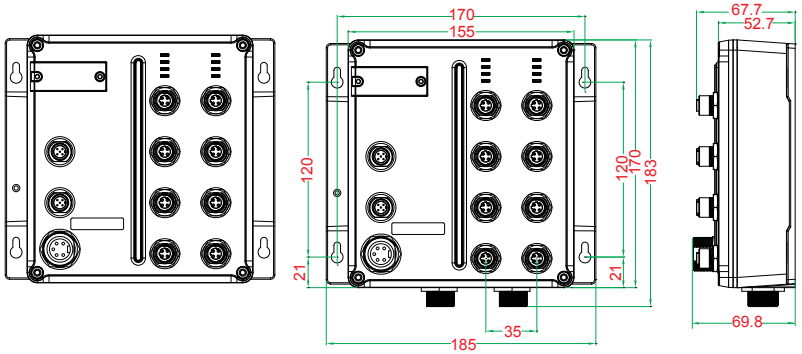
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

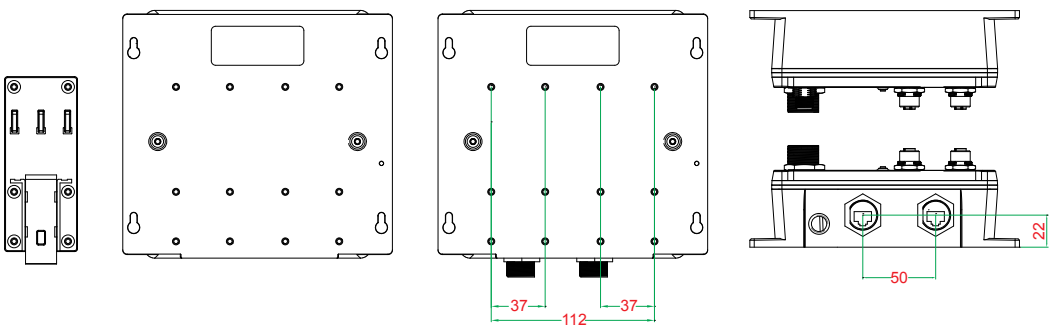
Dimensions (unit = mm)

TN-5508/5510 Series



Front View

Side View



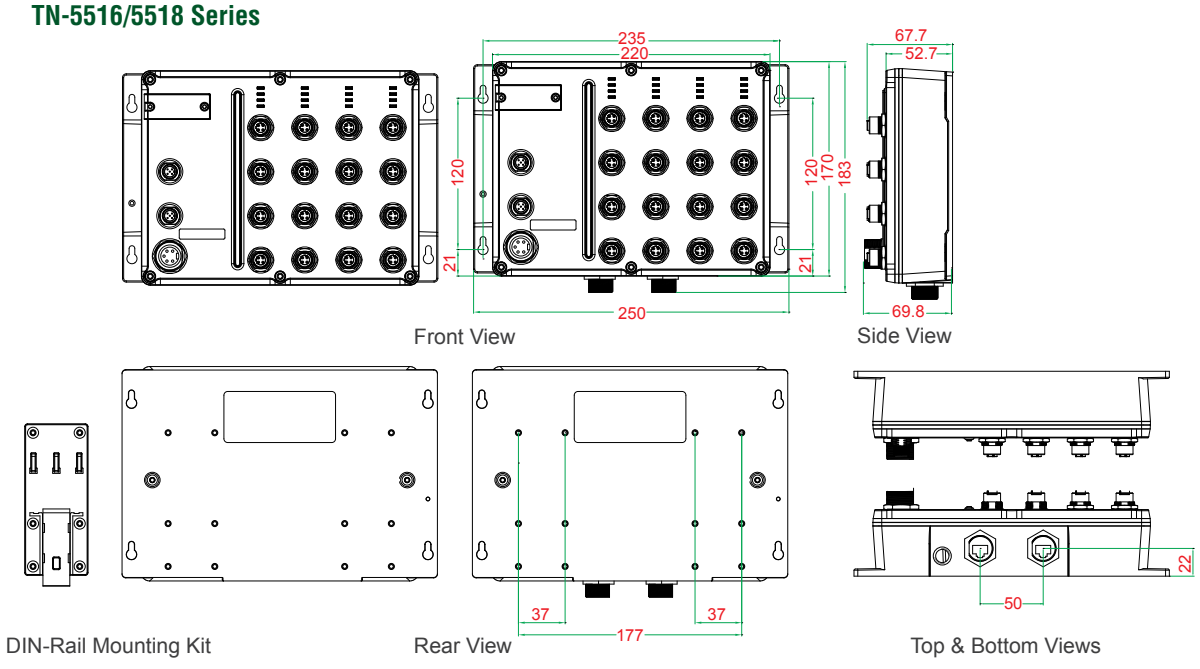
DIN-Rail Mounting Kit

Rear View

Top & Bottom Views

Dimensions (unit = mm)

TN-5516/5518 Series



Ordering Information

Available Models		Port Interface		Power Supply					
		Front Cabling	Down Cabling	Power Supply 1			Power Supply 2		
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100 BaseT(X) M12 connector	10/100/1000 BaseT(X) Circular RJ45 connector Relay bypass function	LV 12/24/36/48 VDC (8.4 to 60 V), non-isolated	MV 72/96/110 VDC (50.4 to 54 V), isolated	HV 88 to 300 VDC and 85 to 264 VAC, isolated	LV 12/24/36/48 VDC (8.4 to 60 V), non-isolated	MV 72/96/110 VDC (50.4 to 154 V), isolated	HV 88 to 300 VDC and 85 to 264 VAC, isolated
TN-5508 Series									
TN-5508-LV-LV	TN-5508-LV-LV-T	8	---	1	---	---	1	---	---
TN-5508-LV-MV	TN-5508-LV-MV-T	8	---	1	---	---	---	1	---
TN-5508-LV-HV	TN-5508-LV-HV-T	8	---	1	---	---	---	---	1
TN-5510 Series									
TN-5510-2GTX-LV-LV	TN-5510-2GTX-LV-LV-T	8	2	1	---	---	1	---	---
TN-5510-2GTX-LV-MV	TN-5510-2GTX-LV-MV-T	8	2	1	---	---	---	1	---
TN-5510-2GTX-LV-HV	TN-5510-2GTX-LV-HV-T	8	2	1	---	---	---	---	1
TN-5516 Series									
TN-5516-LV-LV	TN-5516-LV-LV-T	16	---	1	---	---	1	---	---
TN-5516-LV-MV	TN-5516-LV-MV-T	16	---	1	---	---	---	1	---
TN-5516-LV-HV	TN-5516-LV-HV-T	16	---	1	---	---	---	---	1
TN-5516-MV-MV	TN-5516-MV-MV-T	16	---	---	1	---	---	1	---
TN-5516-MV-HV	TN-5516-MV-HV-T	16	---	---	1	---	---	---	1
TN-5516-HV-HV	TN-5516-HV-HV-T	16	---	---	---	1	---	---	1
TN-5518 Series									
TN-5518-2GTX-LV-LV	TN-5518-2GTX-LV-LV-T	16	2	1	---	---	1	---	---
TN-5518-2GTX-LV-MV	TN-5518-2GTX-LV-MV-T	16	2	1	---	---	---	1	---
TN-5518-2GTX-LV-HV	TN-5518-2GTX-LV-HV-T	16	2	1	---	---	---	---	1
TN-5518-2GTX-MV-MV	TN-5518-2GTX-MV-MV-T	16	2	---	1	---	---	1	---
TN-5518-2GTX-MV-HV	TN-5518-2GTX-MV-HV-T	16	2	---	1	---	---	---	1
TN-5518-2GTX-HV-HV	TN-5518-2GTX-HV-HV-T	16	2	---	---	1	---	---	1

Optional Accessories (must be purchased separately)

DK-DC50131: DIN-Rail mounting kit, 50 x 131 mm

M-type Connectors and Patch Cords:

- M12 connectors and patch cords
- M23 connectors and patch cords

Circular-type Connectors and Patch Cords:

- Circular RJ45 connectors and patch cords

Coming Soon

TN-5308 Series

Preliminary

8-port M12 unmanaged Ethernet switches

- Universal 12/24/36/48 or 72/96/110 VDC power supply range
- M12 connectors and IP40 metal housing
- Supports IEEE 802.3/802.3u/802.3x
- EN50155/50121-3-2/50121-4, NEMA TS2, and e1 compliant
- -40 to 75°C operating temperature range (T models)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The ToughNet TN-5308 series M12 unmanaged Ethernet switches are designed for industrial applications in harsh environments. The TN series switches use M12 connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. The TN-5308 series Ethernet switches provide 8 fast Ethernet M12 ports, support IEEE 802.3/802.3u/802/3x with 10/100M, full/half-duplex, MDI/MDI-X auto-sensing, and provide an economical solution for your industrial Ethernet network. Models with an extended operating temperature range of -40 to 75°C are also available. The TN-5308 series Ethernet switches are compliant with EN50155/50121-3-2/50121-4 (railway applications), NEMA TS2 (traffic control systems), and e1 (vehicles) requirements, making the switches suitable for a variety of industrial applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control

Processing Type: Store and Forward

Flow Control: IEEE802.3x flow control, back pressure flow control

Interface

M12 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode and auto MDI/MDI-X connection

LED Indicators: PWR, LNK/ACT

Power Requirements

Input Voltage:
• TN-5308-LV: 12/24/36/48 VDC (7 to 60 VDC)
• TN-5308-MV: 72/96/110 VDC (50.4 to 154 VDC)

Overload Current Protection: Present

Connection:
• TN-5308-LV: M12 A-coding, 5-pin male connector
• TN-5308-MV: M23 A-coding, 5-pin male connector

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP40 protection

Dimensions:
TN-5308-LV: 60 x 216.6 x 36.1 mm (2.36 x 8.53 x 1.42 in)
TN-5308-MV: 60 x 216.6 x 53.7 mm (2.36 x 8.53 x 2.11 in)

Installation: Panal mounting, DIN-Rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Operating Humidity: 5 to 95% RH (non-condensing)

Regulatory Approvals

Safety: UL508 (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 4
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11
EN61000-4-12

Traffic Control: NEMA TS2 (Pending), e1 (Pending)

Rail Traffic: EN50155 (Environmental, Pending), EN50121-3-2 (Pending), EN50121-4 (Pending)

Shock: IEC61373

Freefall: IEC60068-2-32

Vibration: IEC61373

Note: Please check Moxa's website for the most up-to-date certification status.

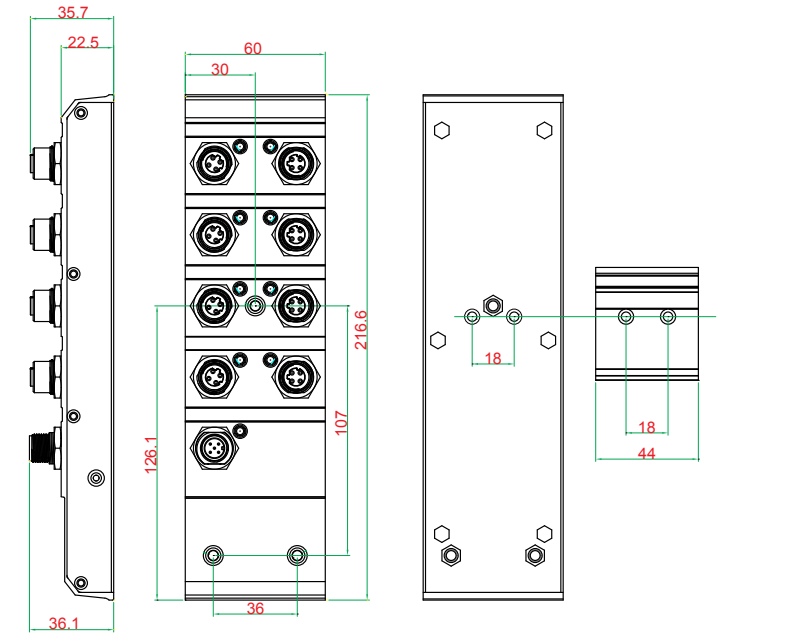
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

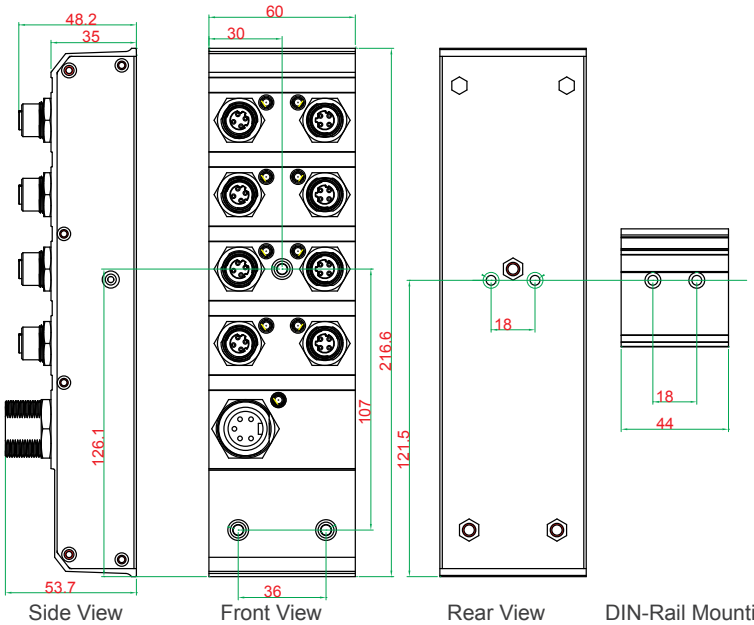
Dimensions (unit = mm)

TN-5308-LV Series



Side View Front View Rear View DIN-Rail Mounting Kit

TN-5308-MV Series



Side View Front View Rear View DIN-Rail Mounting Kit

Ordering Information

Available Models		Power Supply	
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	LV	MV
		12/24/36/48 VDC (7 to 60 V)	72/96/110 VDC (50.4 to 154V)
TN-5308-LV	TN-5308-LV-T	√	---
TN-5308-MV	TN-5308-MV-T	---	√

Optional Accessories (must be purchased separately)

DK-44: DIN-Rail mounting kit, 44 x 48.3 mm

Connectors and Patch Cords: M12-type and M23-type

Coming Soon

TN-5308-4PoE Series

Preliminary

8-port M12 IEEE 802.3af PoE unmanaged Ethernet switches

- M12 connectors and IP40 metal housing
- 4 IEEE 802.3af compliant PoE and Ethernet combo ports
- Provides up to 15.4 watts at 48 VDC per PoE port
- EN50155/50121-3-2/50121-4, NEMA TS2, and e1 compliant
- -40 to 75°C operating temperature range (T models)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The ToughNet TN-5308-4PoE series M12 unmanaged Ethernet switches are designed for industrial applications in harsh environments. The M12 connectors ensure tight, robust connections, and guarantee reliable operation, even for applications that are subject to high vibration and shock. The TN-5308-4PoE series Ethernet switches provide 8 fast Ethernet M12 ports with 4 IEEE 802.3af compliant PoE (Power-over-Ethernet) ports. The switches are classified as power source equipment (PSE) and provide up to 15.4 watts of power per port.

The TN-5308-4PoE switches can be used to power IEEE 802.3af compliant powered devices (PDs), eliminating the need for additional wiring. The switches support IEEE 802.3/802.3u/802/3x with 10/100M, full/half-duplex, MDI/MDI-X auto-sensing, and provide an economical solution for your industrial Ethernet network. Models with an extended operating temperature range of -40 to 75°C are also available. The TN-5308-4PoE switches are compliant with EN50155/50121-3-2/50121-4 (railway applications), NEMA TS2 (traffic control systems), and e1 (vehicles) requirements, making them suitable for a variety of industrial applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.3af for Power-over-Ethernet

Processing Type: Store and Forward

Flow Control: IEEE802.3x flow control, back pressure flow control

Interface

M12 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode and auto MDI/MDI-X connection

LED Indicators: PWR, LNK/ACT, PoE

Power Requirements

Input Voltage: 48 VDC (46 to 50 V)

Overload Current Protection: Present

Connection: M12 A-coding, 5-pin male connector

Reverse Polarity Protection: Present

PoE (per port)

Max. Output Power: 15.4 W

Output Voltage: 44 to 48.5 VDC

Max. Output Current: 350 mA

Max. Overload Protection: 400 mA

Physical Characteristics

Housing: Metal, IP40 protection

Dimensions: 60 x 216.6 x 48.6 mm (2.36 x 8.53 x 1.91 in)

Installation: Panal mounting, DIN-Rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Operating Humidity: 5 to 95% RH (non-condensing)

Regulatory Approvals

Safety: UL508 (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 4
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11
EN61000-4-12

Traffic Control: NEMA TS2 (Pending), e1 (Pending)

Rail Traffic: EN50155 (Environmental, Pending), EN50121-3-2 (Pending), EN50121-4 (Pending)

Shock: IEC61373

Freefall: IEC60068-2-32

Vibration: IEC61373

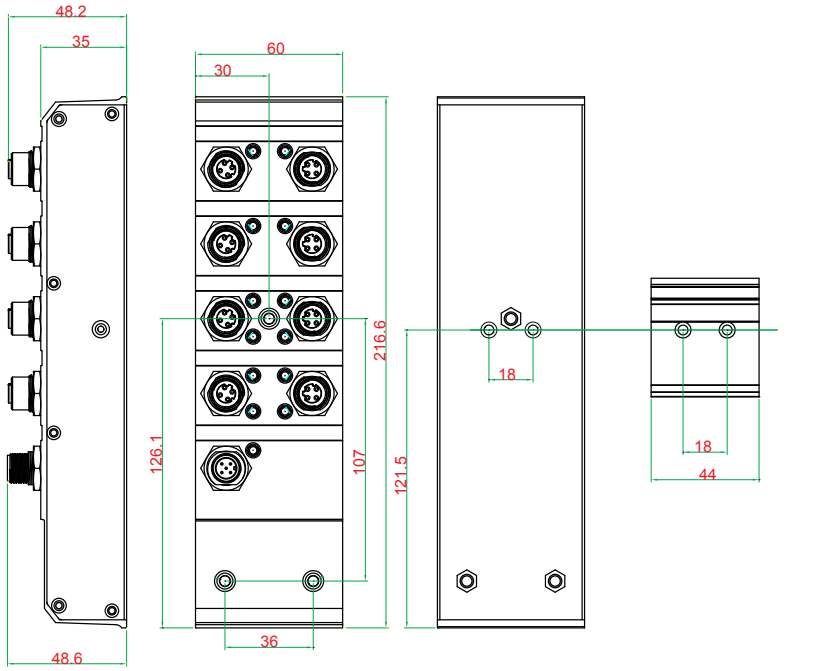
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Ordering Information

Available Models		Port Interface	
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	PoE, 10/100BaseT(X)	10/100BaseT(X)
TN-5308-4PoE	TN-5308-4PoE-T	4	4

Optional Accessories (must be purchased separately)

DK-44: DIN-Rail mounting kit, 44 x 48.3 mm
DR-75-48/DR-120-48: 75/120 W DIN-Rail 48 VDC power supplies
Connectors and Patch Cords: M12-type

EDS-305-M12 Series

5-port M12/IP67 unmanaged Ethernet switches

- M12 connectors and IP67 rated case
- 10/100BaseT(X), 4-pin M12 (D-coding), F/H duplex mode, and auto MDI/MDI-X connection
- Power input: 12 to 45 VDC, 18 to 30 VAC
- -40 to 75°C operating temperature range (T models)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-305-M12 series Ethernet switches are IP67 rated for the toughest industrial applications, which means that the rugged housing and connectors guard against dust, water, and oil. By using M12 connectors, you can rest assured that Ethernet cables will connect tightly to the switch, and will be robust enough to protect your applications from external disturbances, such as the vibration and shock encountered in the transportation industry. The space-saving EDS-305-M12 switches can be mounted virtually anywhere, and wide operating temperature (-40 to 75°C) models are also available for use in the extremest of conditions.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control

Processing Type: Store and Forward

Flow Control: IEEE 802.3x full duplex, back pressure flow control

Interface

M12 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

LED Indicators: Power, LNK/ACT

Power Requirements

Input Voltage:
• 12 to 45 VDC
• 18 to 30 VAC (47 to 63 Hz)

Input Current:
• 0.12A @ 24 VDC
• 0.28A @ 24 VAC

Overload Current Protection: 1.1 A (Limited Current)

Connection: 1 M12 socket (A-coding), single power input

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Plastic, IP67 protection

Dimensions: 60 x 125 x 29.6 mm (2.36 x 4.92 x 1.17 in)

Weight: 250 g

Installation: Field-style mounting, DIN-Rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 4
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 2
EN61000-4-8
EN61000-4-11

Maritime: DNV (Pending), GL (Pending)

Rail Traffic: EN50155 (Environmental), EN50121-4 (Pending), EN50121-3-2 (Pending)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time: 636,000 hrs

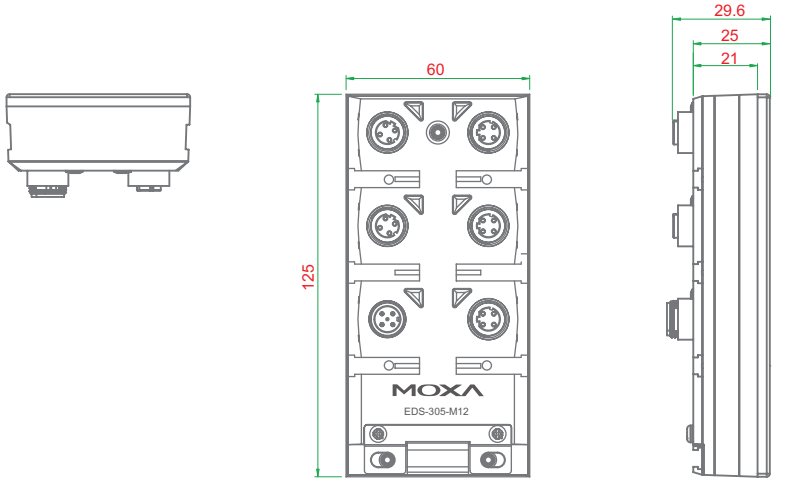
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Top View | Front View | Side View

Ordering Information

Available Models

EDS-305-M12: Industrial M12/IP67 unmanaged Ethernet switch with 5 10/100BaseT(X) ports, 0 to 60°C operating temperature
EDS-305-M12-T: Industrial M12/IP67 unmanaged Ethernet switch with 5 10/100BaseT(X) ports, -40 to 75°C operating temperature

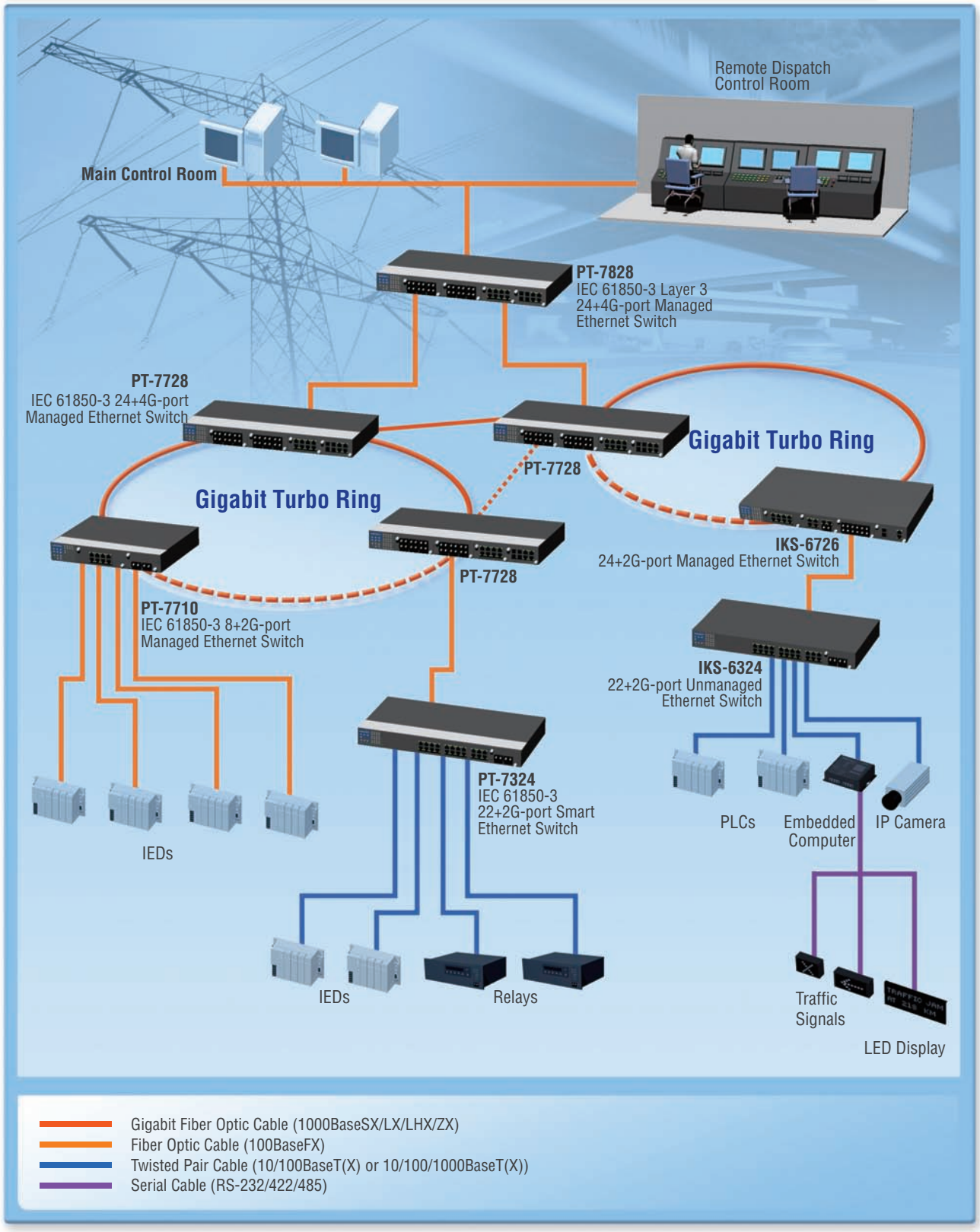
Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
DK-M12-305: DIN-Rail mounting kit for the EDS-305-M12 series
M12 Patch Cords and Sensor Connectors:

M12 Patch Cords		
	CBL-M12D(MM4P)/RJ45-100 IP67	1-meter M12-to-RJ45 Cat-5E UTP Ethernet cable with waterproof 4-pin D-coded M12 connector
	CBL-M12(FF5P)/OPEN-100 IP67	1-meter M12-to-5-pin power cable with waterproof 5-pin A-coded M12 connector
Sensor Connectors		
	M12D-4P-IP68	Field-installable D-coded screw-in sensor connector, male
	M12A-5P-IP68	Field-installable A-coded screw-in sensor connector, female

Introduction to IEC 61850-3 Rackmount Ethernet Switches

Suitable for All Demanding Power Utility Applications



Tailor-made Rackmount Solutions Fit for a Variety of Applications

Ethernet has already penetrated into the industrial environment, and is now used widely in control rooms, and for connecting controllers and devices on the shop floor. Industrial Ethernet is not only being used in a wide range of vertical markets, but is also finding uses in different facets of each market. For example, IEC 61850-3 industrial Ethernet networks are applied as the physical medium for power substation automation, which means that a host of legacy field buses must be connected to the Ethernet network. The bottom line is that Industrial Ethernet is now the future trend for automation communication systems.

Different vertical markets require different solutions, which is why Moxa developed two distinct rackmount Ethernet switch product lines. The new PowerTrans PT series of IEC 61850-3 rackmount Ethernet switches and the IKS industrial rackmount Ethernet switch series were developed to meet the needs of a variety of applications (see the table at the right).

Two Product Lines for Diverse Applications		
Applications	IEC 61850-3 Substation Rail traffic Road traffic	Power automation Traffic control center Marine & offshore
Certifications Required	IEC 61850-3/IEEE 1613 NEMA TS2 EN50121-4 /EN50155 DNV/GL	NEMA TS2 EN50121-4/EN50155 DNV/GL
Moxa's Solutions	PowerTrans PT series IEC 61850-3 rackmount Ethernet switches	IKS series industrial rack-mount Ethernet switch*

* See Chapter 3 for detailed information about Moxa's IKS series of rackmount Ethernet switches.

Scalable Network Infrastructure Capability

Substation and transportation automation networks can be extremely large and cover expansive territories. Moxa's rackmount Ethernet switches satisfy the scalable network requirements with long-haul fiber solutions from Layer 3 to Layer 2 Ethernet switches.

- The PT-7828 Layer 3 Ethernet switch can divide a large network into hierarchical sub-nets. Controlling network traffic on separate subnets can improve the performance of the entire network.
- The PT-7710, PT-7728, and IKS-6727 are Layer 2 modular managed Ethernet switches that support advanced network management and control functions, including VLAN, QOS, IGMP snooping, LACP, and GMRP to optimize and prioritize network communications.
- The Layer 2 PoE modular managed Ethernet switch IKS-6726-PoE, which supports max. 16 PoE (Power-over-Ethernet) ports. The PoE Ethernet switch provides up to 15.4 watts of power per PoE port, and allow power to be supplied to connected devices when AC power is not readily available or cost-prohibitive to provide locally.
- The PT-7324 is a smart Layer 2 Ethernet switch that offers web-smart functions, such as port-based VLAN and QoS, to make network management easier.
- The IKS-6324 series of unmanaged Layer 2 Ethernet switches are reliable plug-and-play Ethernet communication solutions that give users an easy and economical way to connect with end devices.

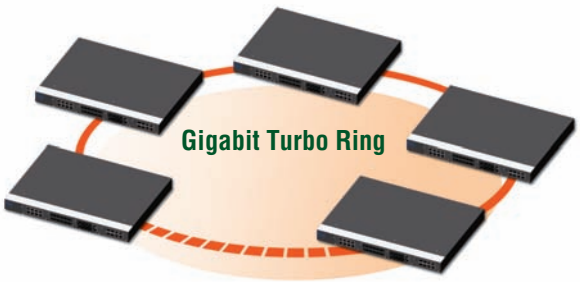
Note: Please check the "Comparison Chart for Rackmount Ethernet Switches" on page 4-19 for details of features that each product model supports.

Redundancy for Higher Network Availability

Moxa's rackmount Ethernet switches provide multiple levels of redundant features:

Media Redundancy

Managed rackmount Ethernet switches come with the world's fastest Turbo Ring redundancy (20 ms @ 250 switches), and standard STP or RSTP redundant protocol. In addition to a single ring redundancy structure, Turbo Ring also provides multiple ring-coupling functions, such as "Ring Coupling," "Dual Homing," and "Dual Ring."



Power Input Redundancy

Non-stop operation is the key criterion for mission-critical applications. The PT-7728/7828 and IKS-6726 support dual, isolated, redundant power supplies with different power sources (24/48 VDC or 110/220 VAC/VDC input voltage). For example, you can choose 110/200 VAC/VDC as your main power source, and 48 VDC from a battery as your back up power source.

Configuration Redundancy

The ABC-01 backup configuration tool can both save and load configurations automatically when connected to a Moxa managed Ethernet switch. This novel management tool helps reduce downtime, and can be used for fast configuration duplication of large-scale networks.

Rugged Design Suitable for Harsh Environments

The rugged design of the PowerTrans PT and IKS series Ethernet switches make them well-qualified for a diverse number of mission-critical communication applications in the power utility and transportation automation markets.

- 19-inch rack-mountable design to meet the installation needs of substation and traffic control rooms.
- To perform flawlessly in the uncontrolled climates found in utility substations and industrial environments, these rackmount Ethernet switches are designed for fan-less operation in a wide temperature range:
  - All PT series Ethernet switches are designed for use in a -40 to 85°C wide operating temperature range.
  - All IKS series Ethernet switches are designed for use in a -40 to 75°C wide operating temperature range.

Future-proof Flexibility

Up to 4 Gigabit Ports for Backbone and Uplink

As industry adopts bandwidth-hungry applications such as video surveillance, there is a greater need for high bandwidth and fault-tolerant solutions with Gigabit Ethernet equipment. Demand is growing for applications in industrial networks that comprise multiple, interconnected Gigabit backbones among different network centers. Moxa offers a range of Gigabit managed Ethernet solutions that can be used to form a Gigabit backbone that connects to control centers, video-over-IP servers, Ethernet-enabled devices, or other Ethernet switches. These Gigabit Ethernet switches support fault-tolerant rings with fiber-optic ports, allowing operation in the toughest industrial environments.

Gigabit Ethernet is the trend, and we can already see a lot of work stations, HMI/SCADA equipment, and video monitoring panels in control rooms that come standard with a Gigabit Ethernet interface.

Moxa's modular rackmount Ethernet switches come with up to 4 Gigabit combo ports for the PT-7728/7828 series. Other modular Ethernet switches include the managed PT-7710 Ethernet switch, the IKS-6726 Ethernet switch, the smart PT-7324 Ethernet switch, and the unmanaged IKS-6324 Ethernet switch, all of which support 2 Gigabit combo ports. Any combination of twisted pair and fiber optic ports can be chosen to form a redundant Gigabit Turbo Ring or connected to a Gigabit HMI/SCADA in the control room.

Media Configuration Flexibility

The PT and IKS series of modular Ethernet switches supports different numbers of Gigabit and fast Ethernet interface modules, which allow users to choose from a variety of copper/fiber media combinations.

The modular design benefits users in three ways:

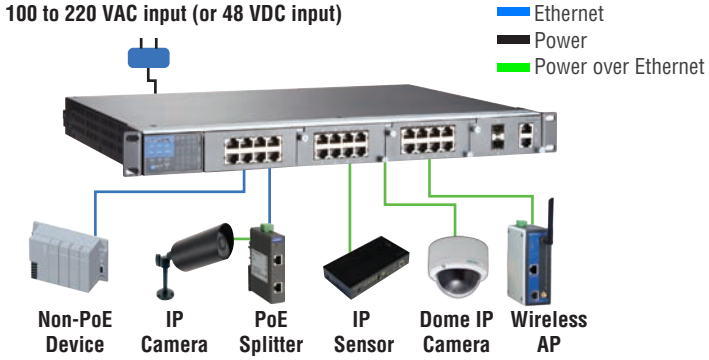
- Higher flexibility for system design and fast network changes
- Easy maintenance and lower cost of spare parts
- Reduced cost of future upgrade

Cabling Flexibility

Moxa's rackmount Ethernet switches provide two options of cabling direction. Front cabling is ideal for maintenance, whereas rear cabling is neater and results in an arrangement that is safer in the event that a cable gets disconnected.

Power-Over-Ethernet Solutions for Rackmount Applications

The IKS-6726-PoE switch comes standard with up to 16 10/100BaseT(X) PoE ports and 2 Gigabit Ethernet ports, making it suitable for applications such as power facility security, where up to 16 IP cameras or IO sensors can be connected to a single IKS-6726-PoE rackmount switch. Gigabit Ethernet and fiber optic ports are supported to secure remote, high bandwidth transmission to the control center. The unique combination of dual redundant power supplies, -40 to 75°C operating temperature range, and Moxa Turbo Ring redundancy ensures high network availability if a link or device fails.



Certifications to Ensure Reliable Operation

Power Substation Certifications

IEC 61850-3

IEC 61850-3 specifically addresses immunity from certain environmental conditions and electromagnetic interference (EMI) for communication networks and systems in substations. The EMI immunity requirements are based on IEC 61000-6-5, which establishes performance criteria for key functions within the substation. To be compliant with the standard, critical functions, such as protection relay

and control functions, on-line processing and regulation, as well as metering and network communication, must experience no delays or data loss when exposed to various EMI phenomena.

IEEE 1613

IEEE 1613 is another industry standard that establishes EMI immunity requirements for networking devices in electric power substations. Included in this standard are ratings, environmental performance requirements, and testing requirements for compliant communication devices.

According to the IEEE 1613 standard, compliant devices may not experience permanent damage under EMI stress. Two different classes of devices are defined in the standard according to how EMI stress affects performance.

Class 1

Compliant devices in this class may experience some data errors, losses, or delays under EMI stress conditions.

Class 2

Compliant devices in this class must not experience any data errors, delays, or losses under EMI stress conditions.

The PowerTrans PT series is compliant with IEC 61850-3 and IEEE 1613 certifications specifying a high level of EMC, shock, and vibration in power substations.

Road Traffic Control System Standard

NEMA TS2

The National Electrical Manufacturers Association (NEMA) established the TS1 standard to define technically adequate and safe traffic control equipment. The TS2 standard was later introduced to address some drawbacks of the original guidelines. NEMA TS2 defines controllers, cabinets, and systems more completely than TS1, promotes better interchangeability, and allows for future expansion. Section 2 contains the environmental and testing requirements, including guidelines for temperature, humidity, voltage, vibration, and shock. PT series and IKS series switches are compliant with the NEMA TS2 traffic control system standard.

Test	NEMA TS2
Temperature	-34 to 74°C
Humidity	18% to 90% RH, non-condensing
Voltage	120 to 135 VAC @ 57 to 63 Hz
Vibration	0.5 g @ 5 to 30 Hz
Shock	10 g's for 11 ms

Railway Control System Standards

EN50121-4

EN50121-4 defines emission and immunity standards for signaling and telecommunication apparatus.

EN50155

The complete PT and IKS series are certified according to the EN50155 ensuring safe deployment for railway applications.

Comparison Chart for Rackmount Ethernet Switches

	Port Interfaces				Certifications				Features												
Model	Total Number of Ports	Gigabit Ethernet (10/100/1000 Mbps)	Fast Ethernet (10/100 Mbps)	PoE, Fast Ethernet (10/100 Mbps)	IEC 61850-3, IEEE 1613	NEMA TS2	EN50155/EN50121-4	DNV/GL	Layer 3 Switching	Turbo Ring and RSTP/STP	IGMP snooping/GMRP	Port Trunking	IEEE 802.1X/HTTPS/SSH	Port Lock	SNMP/RMON	802.1Q VLAN	Port-based VLAN	QoS	Isolated Redundant Power	ABC-01*
PT-7828	28	4	24	---	√	√	√	P	√	√	√	√	√	√	√	√	---	√	√	√
PT-7728	28	4	24	---	√	√	√	P	---	√	√	√	√	√	√	√	---	√	√	√
PT-7710	10	2	8	---	√	√	√	P	---	√	√	√	√	√	√	√	√	√	---	√
PT-7324	24	2	22	---	√	√	√	P	---	---	---	---	---	---	---	---	√	√	---	---
IKS-6726	26	2	24	---	---	√	√	P	---	√	√	√	√	√	√	√	---	√	√	√
IKS-6726-PoE	26	2	8	16	---	√	√	P	---	√	√	√	√	√	√	√	---	√	√	√
IKS-6324	24	2	22	---	---	√	√	P	---	---	---	---	---	---	---	---	---	---	---	---

√ = Available P = Pending Note: Please check Moxa's website for the most up-to-date certification status.

(All products listed support a wide operating temperature range: -40 to 85°C for the PT series, and -40 to 75°C for the IKS series.)
*ABC-01 is an RS-232 RJ45-based automatic backup configurator for managed Ethernet Switches. See page 3-48 for details.

PT-7828 Series

IEC 61850-3 24+4G-port Layer 3 Gigabit modular managed rackmount Ethernet switches

- Layer 3 routing interconnects multiple LAN segments
- IEC 61850-3, IEEE 1613 (power substations), NEMA TS2 (traffic control systems), and EN50121-4 (railway applications) compliant
- Turbo Ring and RSTP/STP for Ethernet redundancy
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- Modular design for various media options: RJ45, fiber optic, M12, and SFP ports
- -40 to 85°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The PowerTrans PT-7828 switches are high performance Layer 3 Ethernet switches that support Layer 3 routing functionality to facilitate the deployment of applications across networks. The PT-7828 switches are also designed to meet the strict demands of power substation automation systems (IEC 61850-3, IEEE 1613), traffic control systems (NEMA TS2), and railway applications (EN50121-4).

The PT-7828's Gigabit and fast Ethernet backbone, redundant ring, and 24/48 VDC or 110/220 VDC/VAC dual isolated redundant power supplies increase the reliability of your communications and save on cabling and wiring costs. The modular design of the PT-7828 makes network planning easy, and allows greater flexibility by letting you install up to 4 Gigabit ports and 24 fast Ethernet ports. Optional front or rear wiring makes the PT-7828 switches suitable for a variety of applications.

Features and Benefits

- Layer 3 switching functionality to divide a large network into hierarchical subnets and allow data and information to communicate across networks
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocols to ease network planning
- QoS (IEEE802.1p/1Q) and TOS/DiffServ to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Automatic recovery of connected devices' IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, Windows utility, and ABC-01 automatic backup configurator

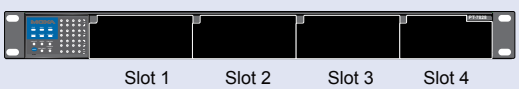
Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, RIP V1/V2, HTTP, HTTPS, Telnet, SSH, Syslog (Available Soon: DHCP Option 66/67/82, LLDP, Modbus/TCP, IEEE 1588 PTP)

Layer 3 Modular Rackmount Ethernet Switch System, PT-7828



Layer 3 Switching: Static routing, RIP V1/V2, OSPF, DVMRP, PIM-DM, VRRP for router redundancy

MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

Fast Ethernet: Slots 1, 2, and 3 for any combination of 4, 6, 7, or 8-port PM-7200 fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST connector), or 100BaseSFP

Gigabit Ethernet: Slot 4 for 2 or 4-port PM-7200 Gigabit Ethernet combo module, 10/100/1000BaseT(X) or 1000BaseSFP

Console Port: RS-232 (RJ45)

System LED Indicators: STAT, PWR1, PWR2, FAULT, MASTER, COUPLER

Module LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED

Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
- 24 VDC (18 to 36 V)
- 48 VDC (36 to 72 V)
- 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)

Input Current: (all ports are equipped with fiber)
- Max. 2.58 A @ 24 VDC
- Max. 1.21 A @ 48 VDC
- Max. 0.64/0.33 A @ 110/220 VDC
- Max. 0.53/0.28 A @ 110/220 VAC

Overload Current Protection: Present

Connection: 10-pin terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)

Weight: 5900 g

Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F), cold start requires min. of 100 VAC at -40°C

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL60950-1, CSA C22.2 No. 60950-1, EN60950-1 (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

Power Automation: IEC 61850-3, IEEE 1613

Maritime: DNV (Pending), GL (Pending)

Traffic Control: NEMA TS2 (Pending)

Rail Traffic: EN50155/EN50121-4

Shock: IEC 60068-2-27

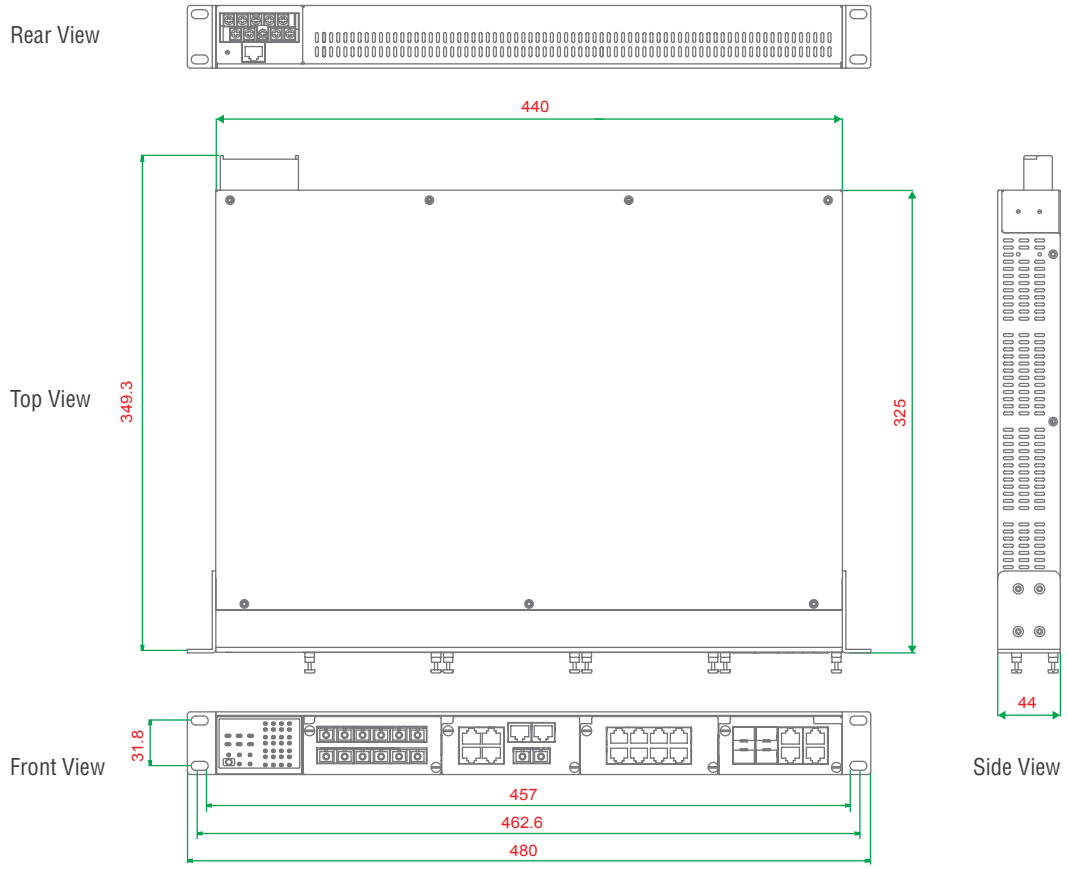
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Ordering Information

Step 1: Select Ethernet switch system

PT-7828 with power supply

Step 2: Select interface modules

PM-7200 module
(Gigabit or fast Ethernet)

Note: The PT-7828 Ethernet switch system is delivered without interface modules. See page 4-31 to choose PM-7200 interface modules.

PT-7828 Layer 3 Modular Rackmount Ethernet Switch System

The PT-7828 switch system consists of 18 Layer 3 modular managed rackmount Ethernet switch systems, each with 3 slots for fast Ethernet modules and 1 slot for a Gigabit Ethernet module. A total of 24+4G ports can be installed, and the switch can be used in a temperature range from -40 to 85°C.

Available Models		Power Supply					
		Isolated Power Supply 1			Isolated Power Supply 2		
Front Cabling, Front Display	Rear Cabling, Front Display	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC
PT-7828-F-24	PT-7828-R-24	1	---	---	---	---	---
PT-7828-F-24-24	PT-7828-R-24-24	1	---	---	1	---	---
PT-7828-F-24-48	PT-7828-R-24-48	1	---	---	---	1	---
PT-7828-F-24-HV	PT-7828-R-24-HV	1	---	---	---	---	1
PT-7828-F-48	PT-7828-R-48	---	1	---	---	---	---
PT-7828-F-48-48	PT-7828-R-48-48	---	1	---	---	1	---
PT-7828-F-48-HV	PT-7828-R-48-HV	---	1	---	---	---	1
PT-7828-F-HV	PT-7828-R-HV	---	---	1	---	---	---
PT-7828-F-HV-HV	PT-7828-R-HV-HV	---	---	1	---	---	1

Note: The PT-7828 Layer 3 Ethernet switch systems provide 1 slot for a Gigabit Ethernet interface module and 3 slots for fast Ethernet interface modules. See page 4-31 to select the PM-7200 Gigabit Ethernet and fast Ethernet interface modules for your own application.

PT-7828-F series
(Front Cabling, Front Display)

PT-7828-R series
(Rear Cabling, Front Display)

Gigabit/Fast Ethernet Modules for the PT-7828

	Interface Module																							
Product Model	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1LSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8PoE	PM-7200-8SFP	PM-7200-4M12
Slot 1	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 2	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 3	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 4	√	√	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

PT-7728 Series

IEC 61850-3 24+4G-port Gigabit modular managed rackmount Ethernet switches

- IEC 61850-3, IEEE 1613 (power substations), NEMA TS2 (traffic control systems), and EN50121-4 (railway applications) compliant
- Turbo Ring and RSTP/STP for Ethernet Redundancy
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- Modular design lets you choose from a variety of media combinations
- -40 to 85°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The PowerTrans PT-7728 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613), traffic control systems (NEMA TS2), and railway applications (EN50121-4). The PT-7728's Gigabit and fast Ethernet backbone, redundant ring, and 24/48 VDC or 110/220 VDC/VAC dual isolated redundant power supplies increase the reliability of your communications and save on cabling/wiring costs.

The modular design of the PT-7728 also makes network planning easy, and allows greater flexibility by letting you install up to 4 Gigabit ports and 24 fast Ethernet ports. Along with the optional front or rear wiring, these features together make the PT-7728 suitable for a variety of industrial applications.

Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocols to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port limits access to authorized MAC addresses only
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/Serial console, Windows utility, and ABC-01 automatic backup configurator

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog (Available Soon: DHCP Option 66/67/82, LLDP, Modbus/TCP, IEEE 1588 PTP, IPv6)

Modular Rackmount Ethernet Switch System, PT-7728

MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Slots 1, 2, and 3 for any combination of 4, 6, 7, or 8-port PM-7200 fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST connector), or 100BaseSFP

Gigabit Ethernet: Slot 4 for 2 or 4-port PM-7200 Gigabit Ethernet combo module, 10/100/1000BaseT(X) or 1000BaseSFP

Console Port: RS-232 (RJ45)

System LED Indicators: STAT, PWR1, PWR2, FAULT, MASTER, COUPLER

Module LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED

Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
- 24 VDC (18 to 36 V)
- 48 VDC (36 to 72 V)
- 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)

Input Current: (all ports are equipped with fiber)
- Max. 2.58 A @ 24 VDC
- Max. 1.21 A @ 48 VDC
- Max. 0.64/0.33 A @ 110/220 VDC
- Max. 0.53/0.28 A @ 110/220 VAC

Overload Current Protection: Present

Connection: 10-pin terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)

Weight: 5900 g

Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F), cold start requires min. of 100 VAC at -40°C

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL60950-1, CSA C22.2 No. 60950-1, EN60950-1 (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

Power Automation: IEC 61850-3, IEEE 1613

Maritime: DNV (Pending), GL (Pending)

Traffic Control: NEMA TS2 (Pending)

Rail Traffic: EN50155/EN50121-4

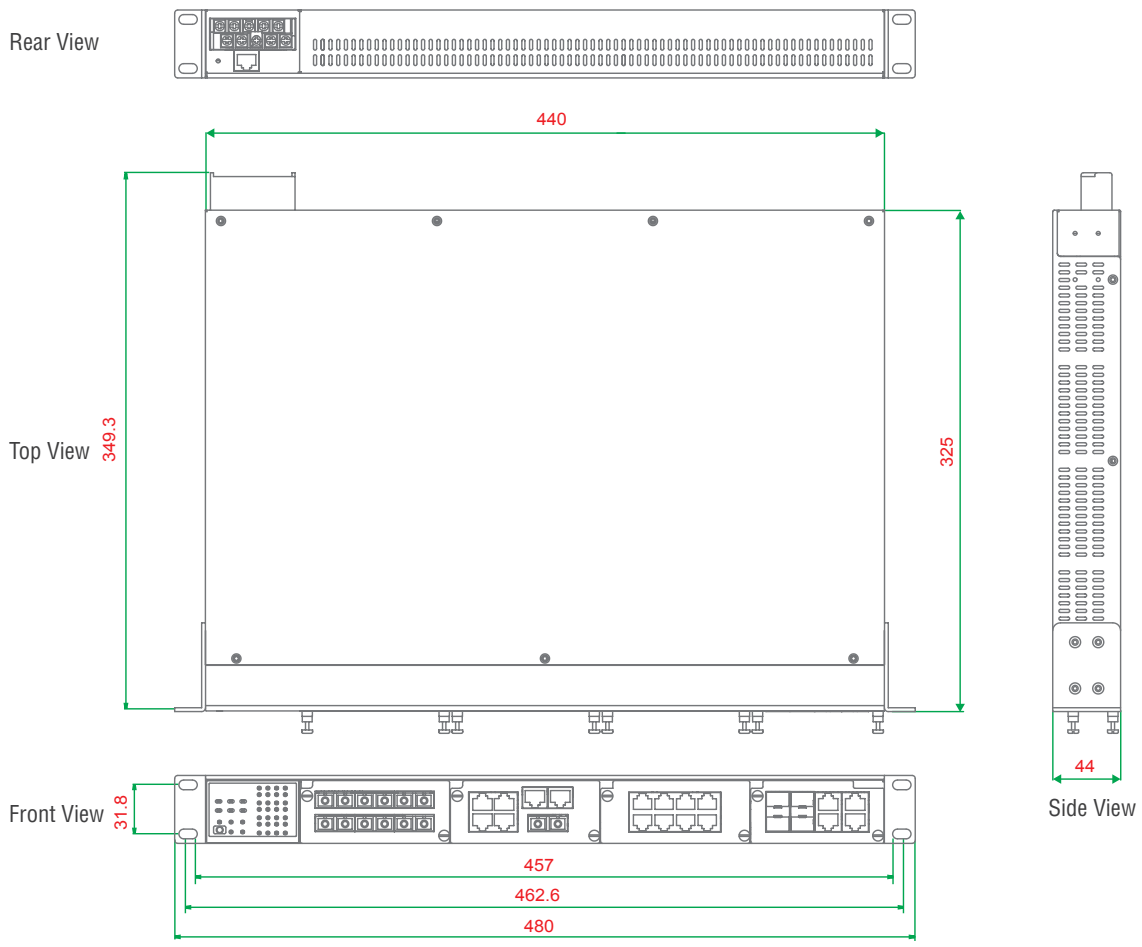
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Ordering Information

Step 1: Select Ethernet switch system

PT-7728 with power supply

Step 2: Select interface modules

PM-7200 modules
(Gigabit or fast Ethernet)

Note: The PT-7728 Ethernet switch system is delivered without interface module. See page 4-31 to choose PM-7200 interface modules.

PT-7728 Modular Rackmount Ethernet Switch System

The PT-7728 switch system consists of 18 modular managed rackmount Ethernet switch systems with 3 slots for fast Ethernet modules, and 1 slot for a Gigabit Ethernet module. A total of 24+4G ports can be installed, and the switch can be used in a temperature range from -40 to 85°C.

Available Models		Power Supply					
		Isolated Power Supply 1			Isolated Power Supply 2		
Front Cabling, Front Display	Rear Cabling, Front Display	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC
PT-7728-F-24	PT-7728-R-24	1	---	---	---	---	---
PT-7728-F-24-24	PT-7728-R-24-24	1	---	---	1	---	---
PT-7728-F-24-48	PT-7728-R-24-48	1	---	---	---	1	---
PT-7728-F-24-HV	PT-7728-R-24-HV	1	---	---	---	---	1
PT-7728-F-48	PT-7728-R-48	---	1	---	---	---	---
PT-7728-F-48-48	PT-7728-R-48-48	---	1	---	---	1	---
PT-7728-F-48-HV	PT-7728-R-48-HV	---	1	---	---	---	1
PT-7728-F-HV	PT-7728-R-HV	---	---	1	---	---	---
PT-7728-F-HV-HV	PT-7728-R-HV-HV	---	---	1	---	---	1

Note: The PT-7728 Ethernet switch systems provide 1 slot for a Gigabit Ethernet interface modules and 3 slots for fast Ethernet interface modules. See page 4-31 to select the PM-7200 Gigabit Ethernet and fast Ethernet interface modules that you need for your own application.

PT-7728-F series
(Front Cabling, Front Display)

PT-7728-R series
(Rear Cabling, Front Display)

Gigabit/Fast Ethernet Modules for the PT-7728

Product Model	Interface Module																							
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1LSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8PoE	PM-7200-8SFP	PM-7200-4M12
Slot 1	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 2	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 3	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 4	√	√	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

PT-7710 Series

IEC 61850-3 8+2G-port Gigabit modular managed rackmount Ethernet switches

- IEC 61850-3, IEEE 1613 (power substations), NEMA TS2 (traffic control systems), and EN50121-4 (railway applications) compliant
- Turbo Ring and RSTP/STP for Ethernet redundancy
- Universal power supply range, 12/24/48 VDC or 110/220 VDC/VAC
- Modular design lets you choose from a variety of media combinations
- -40 to 85°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The PowerTrans PT-7710 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613), traffic control systems (NEMA TS2), and railway applications (EN50121-4). The PT-7710's Gigabit and fast Ethernet backbone, redundant ring, and 12/24/48 VDC dual redundant power supplies or 110/220 VDC/VAC power supplies increase the reliability of the communications and reduce cabling and wiring costs. The modular design of the PT-7710 makes network planning easy, and allows greater flexibility by letting you install up to 2 Gigabit ports and 8 fast Ethernet ports, or 10 fast Ethernet ports.

Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP protocol to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port to limit access to authorized MAC addresses only
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, Windows utility, and ABC-01 automatic backup configurator

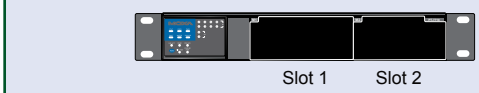
Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog (Available Soon: DHCP Option 66/67/82, LLDP, Modbus/TCP, IEEE 1588 PTP, IPv6)

Modular Rackmount Ethernet Switch System, PT-7710



MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Slot 1 for any combination of 4, 6, 7, or 8-port PM-7200 fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST connector), or 100BaseSFP; Slot 2 for 1 or 2-port interface modules with 100BaseFX (SC/ST connector)

Gigabit Ethernet: Slot 2 for 2-port PM-7200 Gigabit Ethernet combo module with 10/100/1000BaseT(X) or 1000BaseSFP slots

Console Port: RS-232 (RJ45)

System LED Indicators: STAT, PWR1, PWR2, FAULT, MASTER, COUPLER

Module LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED

Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
- 12/24/48 VDC (9 to 60 V)
- 110/220 VDC/VAC (88 to 300 VDC and 85 to 264 VAC)

Input Current: (all ports are equipped with fiber)
- Max. 0.81 A @ 24 VDC
- Max. 0.42 A @ 48 VDC
- Max. 0.17/0.10 A @ 110/220 VDC
- Max. 0.20/0.12 A @ 110/220 VAC

Overload Current Protection: Present

Connection: 10-pin terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 266.7 x 44 x 195 mm (10.5 x 1.73 x 7.68 in)

Weight: 2200 g

Installation: 19'' rack mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL60950-1, CSA C22.2 No. 60950-1, EN60950-1 (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

Power Automation: IEC 61850-3, IEEE 1613

Maritime: DNV (Pending), GL (Pending)

Traffic Control: NEMA TS2 (Pending)

Rail Traffic: EN50155/EN50121-4

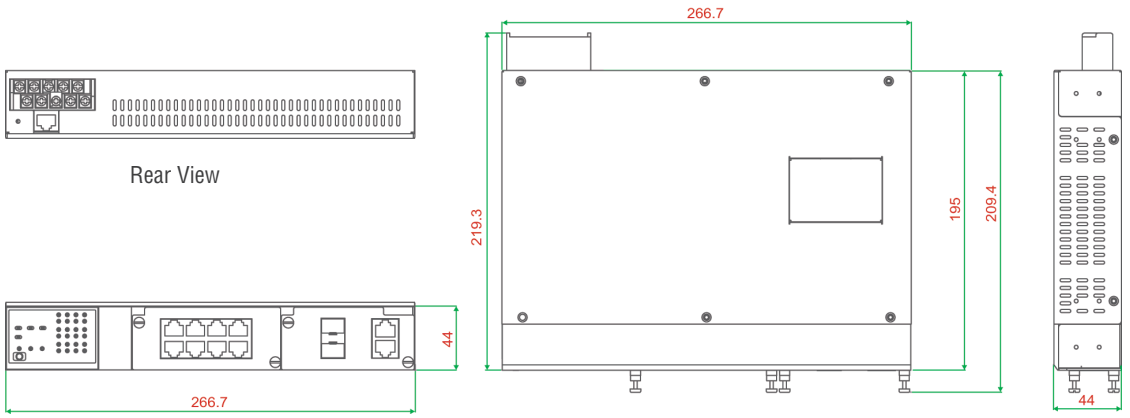
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Ordering Information

Step 1: Select Ethernet switch system → **Step 2: Select interface modules**

PT-7710 with power supply → **PM-7200 modules (Gigabit or fast Ethernet)**

Note: The PT-7710 Ethernet switch system is delivered without interface module. See page 4-31 to choose PM-7200 interface modules.

PT-7710 Modular Rackmount Ethernet Switch System

The PT-7710 switch system consists of 4 modular managed rackmount Ethernet switch systems with 1 slot for a fast Ethernet module, and 1 slot for a fast Ethernet or Gigabit Ethernet module. A total of 10 or 8+2G ports can be installed, and the switch can be used in a temperature range from -40 to 85°C.

Available Models		Power Supply	
Rackmounting, Front Cabling, Front Display	Wall mounting, Down Cabling, Front Display	LV: 12/24/48 VDC (9 to 60 V) (Dual power inputs)	HV: 88 to 300 VDC and 85 to 264 VAC, isolated
PT-7710-F-LV	PT-7710-D-LV	1	---
PT-7710-F-HV	PT-7710-D-HV	---	1

Note: The PT-7710 Ethernet switch systems provide 1 slot for a Gigabit Ethernet interface module and 1 slot for a fast Ethernet interface module. See page 4-31 to select the PM-7200 Gigabit Ethernet and fast Ethernet interface modules that you need for your own application.

PT-7710-F series
(Rackmounting, Front Cabling, Front Display)

PT-7710-D series
(Wall mounting, Down Cabling, Front Display)

Gigabit/Fast Ethernet Modules for the PT-7710

	Interface Module																							
Product Model	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1LSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8PoE	PM-7200-8SFP	PM-7200-4M12
Slot 1	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 2	---	√	√	√	√	√	√	√	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

PT-7324 Series

IEC 61850-3 22+2G-port Gigabit smart rackmount Ethernet switches

- IEC 61850-3, IEEE 1613 (power substations), NEMA TS2 (traffic control systems), and EN50121-4 (railway applications) compliant
- Port-based VLAN to enhance security/network performance
- 802.1p priority queues, port-based QoS
- Smart web-based management makes configuration easy
- Universal power supply range, 12/24/48 VDC or 110/220 VDC/VAC
- -40 to 85°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

IEC 61850-3 / IEEE 1613 CE FC

Introduction

The PowerTrans PT-7324 smart Ethernet switch is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613), traffic control systems (NEMA TS2), and railway applications (EN50121-4). The PT-7324 is also equipped with smart "Class of Service" features suitable for multimedia applications, and port-based VLAN features that can be used to segment your network without being restricted by physical connections. If you do not want to receive too many broadcast packets, the broadcast storm filtering feature will discard broadcast packets if the number of such packets exceeds a threshold in a preset period of time.

Features and Benefits

- Port-based VLAN to ease network planning
- 802.1p priority queues and port-based QoS to increase determinism
- Broadcast storm filtering

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3x for Flow Control
IEEE 802.1p for Class of Service

Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 2

Max. Number of Available VLANs: 24

Interface

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode and auto MDI/MDI-X connection

Fiber Ports: 100BaseFX (SC/ST connector) or 1000BaseSFP slots

LED Indicators: STAT, PWR1, PWR2, FAULT, LNK/ACT, FDX/HDX, SPEED

Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Note: Slot 1 for a 2-port PM-7200 Gigabit Ethernet combo module, or 1 or 2-port PM-7200 fast Ethernet module.

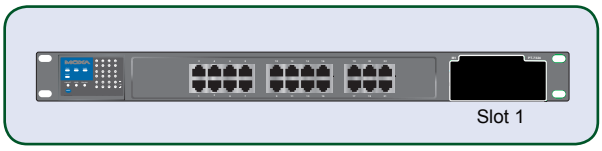
Power Requirements

Input Voltage:
• 12/24/48 VDC (9 to 60 V)
• 110/220 VDC/VAC (88 to 300 VDC and 85 to 264 VAC)

Input Current: (all ports are equipped with fiber)
• Max. 0.68 A @ 24 VDC
• Max. 0.35 A @ 48 VDC
• Max. 0.17/0.11 A @ 110/220 VDC
• Max. 0.33/0.23 A @ 110/220 VAC

Overload Current Protection: Present

Smart Rackmount Ethernet Switch System, PT-7324



Connection: 10-pin terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 440 x 44 x 254 mm (17.32 x 1.73 x 10.00 in)

Weight: 3300 g

Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL60950-1, CSA C22.2 No. 60950-1, EN60950-1 (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

Power Automation: IEC 61850-3, IEEE 1613

Maritime: DNV (Pending), GL (Pending)

Traffic Control: NEMA TS2 (Pending)

Rail Traffic: EN50155/EN50121-4

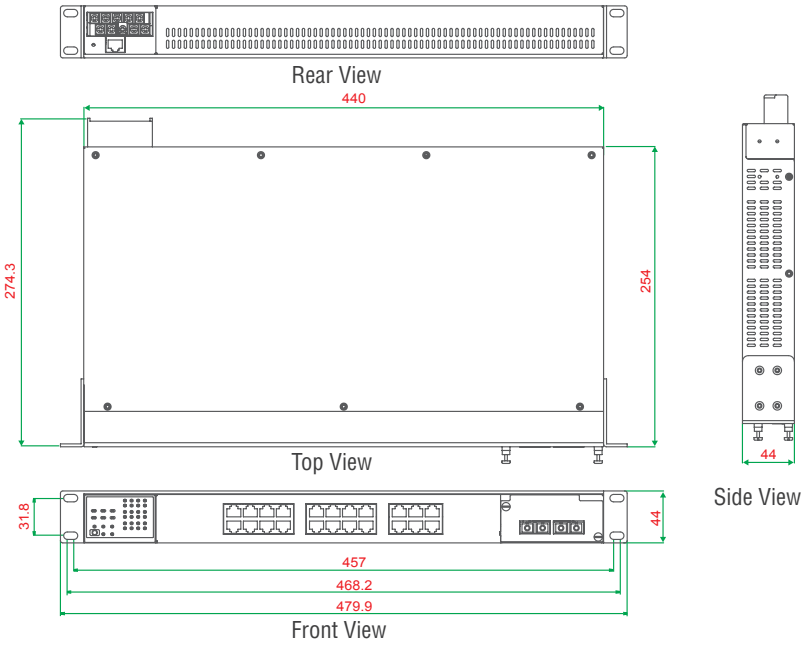
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Ordering Information

Step 1: Select Ethernet switch system **Step 2: Select interface modules**

PT-7324 with power supply → **PM-7200 modules (Gigabit or fast Ethernet)**

Note: The PT-7324 Ethernet switch system is delivered without interface module. See page 4-31 to choose PM-7200 interface modules.

PT-7324 Smart Rackmount Ethernet Switch System

The PT-7324 switch system consists of 4 smart rackmount Ethernet switch systems with 22 10/100BaseT(X) ports, and 1 slot for a fast Ethernet or Gigabit Ethernet module. A total of 24 or 22+2G ports can be installed, and the switch can be used in a temperature range from -40 to 85°C.

Available Models		Power Supply	
Front Cabling, Front Display	Rear Cabling, Front Display	LV: 12/24/48 VDC (9 to 60 V) (Dual power inputs)	HV: 88 to 300 VDC and 85 to 264 VAC, isolated
PT-7324-F-LV	PT-7324-R-LV	1	---
PT-7324-F-HV	PT-7324-R-HV	---	1

Note: The PT-7324 Ethernet switch systems provide 1 slot for a Gigabit Ethernet or fast Ethernet interface module. See page 4-31 to select the PM-7200 series Gigabit Ethernet and fast Ethernet interface modules that you need for your own application.

PT-7324-F series
(Front Cabling, Front Display)

PT-7324-R series
(Rear Cabling, Front Display)

Gigabit/Fast Ethernet Modules for the PT-7324

	Interface Modules						
	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-1SSC	PM-7200-2MSC	PM-7200-2MST	PM-7200-2SSC
Slot 1	√	√	√	√	√	√	√

PM-7200 Series

Gigabit and fast Ethernet modules for PT and IKS series switches

Specifications

Gigabit Ethernet Interface Modules, PM-7200-2G/4G series

PM-7200-4GTXSFP

PM-7200-2GTXSFP

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, and auto MDI/MDI-X connection

Fiber Ports: 1000BaseSFP slots

Note: The PM-7200-2G/4G series Gigabit Ethernet combo modules support 2 or 4 SFP slots. See page 3-45 to select the SFP-1G series Gigabit Ethernet modules for your application.

Fast Ethernet Interface Modules, PM-7200 series

PM-7200-8TX

PM-7200-6MSC
PM-7200-6SSC

PM-7200-6MST

PM-7200-4MSC2TX
PM-7200-4SSC2TX

PM-7200-4MST2TX

PM-7200-2MSC4TX
PM-7200-2SSC4TX

PM-7200-2MST4TX

PM-7200-1LSC6TX

PM-7200-2MSC
PM-7200-2SSC

PM-7200-2MST

PM-7200-1MSC
PM-7200-1SSC

PM-7200-1MST

PM-7200-1MST6TX

PM-7200-1MSC6TX
PM-7200-1SSC6TX

COMING SOON

PM-7200-8PoE

COMING SOON

PM-7200-8SFP

COMING SOON

PM-7200-4M12

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

Fiber Ports: 100BaseFX ports (SC/ST or SFP LC connector)

PoE Ports: IEEE 802.3af Power-over-Ethernet Technology, provide up to 15.4 watts per port

M12 ports: 10/100BaseT(X) auto negotiation speed, and auto MDI/MDI-X connection

Optical Fiber

	100BaseFX		
	Multi-mode	Single-mode	Single-mode, 80 km
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-10 dBm	0 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm
Link Budget	12 dB	29 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]	80 km [d]
Saturation	-6 dBm	-3 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Ordering Information

Rackmount Ethernet Switch System and Interface Module Compatibility Chart

Product Model	Interface Modules																								
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1MSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1LSC6TX	PM-7200-8PoE	PM-7200-8SFP*	PM-7200-4M12
PT-7828	√	√	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
PT-7728	√	√	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
PT-7710	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
PT-7324	---	√	√	√	√	√	√	√	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
IKS-6726	---	√	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
IKS-6726-PoE	---	√	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
IKS-6324	---	√	√	√	√	√	√	√	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

* If you are using an SFP-1FELLC module, the operating temperature is limited to -40 to 75°C (-40 to 167°F).

Gigabit Ethernet Modules for PT and IKS Series Rackmount Ethernet Switches, PM-7200-2G/4G Series

Available Models	Port Interface
	Combo Port, 10/100/1000BaseT(X) or 1000BaseSFP*
PM-7200-2GTXSFP	2
PM-7200-4GTXSFP	4

*The PM-7200-2G/4G series Gigabit Ethernet combo modules support 2 or 4 SFP slots. See page 3-45 for SFP-1G series Gigabit Ethernet SFP module information.

Fast Ethernet Modules for PT and IKS Series Rackmount Ethernet Switches, PM-7200 Series

Available Models	Port Interface							
	10/100BaseT(X)			100BaseFX				100BaseSFP
	TP	PoE	M12	Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector	Single-mode, SC Connector, 80 km	
PM-7200-8TX	8	---	---	---	---	---	---	---
PM-7200-6MSC	---	---	---	6	---	---	---	---
PM-7200-6MST	---	---	---	---	6	---	---	---
PM-7200-6SSC	---	---	---	---	---	6	---	---
PM-7200-4MSC2TX	2	---	---	4	---	---	---	---
PM-7200-4MST2TX	2	---	---	---	4	---	---	---
PM-7200-4SSC2TX	2	---	---	---	---	4	---	---
PM-7200-2MSC4TX	4	---	---	2	---	---	---	---
PM-7200-2MST4TX	4	---	---	---	2	---	---	---
PM-7200-2SSC4TX	4	---	---	---	---	2	---	---
PM-7200-1LSC6TX	6	---	---	---	---	---	1	---
PM-7200-2MSC	---	---	---	2	---	---	---	---
PM-7200-2MST	---	---	---	---	2	---	---	---
PM-7200-2SSC	---	---	---	---	---	2	---	---
PM-7200-1MSC	---	---	---	1	---	---	---	---
PM-7200-1MST	---	---	---	---	1	---	---	---
PM-7200-1SSC	---	---	---	---	---	1	---	---
PM-7200-1MSC6TX	6	---	---	1	---	---	---	---
PM-7200-1MST6TX	6	---	---	---	1	---	---	---
PM-7200-1SSC6TX	6	---	---	---	---	1	---	---
PM-7200-8PoE	---	8	---	---	---	---	---	---
PM-7200-8SFP	---	---	---	---	---	---	---	8
PM-7200-4M12	---	---	4	---	---	---	---	---

Industrial I/O

Product Selection Guides

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Modular Type I/Os 5-2

Industrial I/O

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Industrial I/O

Stand-alone Type I/Os

Model	ioLogik W5340	ioLogik E2210	ioLogik E2212	ioLogik E2214	ioLogik E2240	ioLogik E2242
Category	Cellular GPRS I/O	Active Ethernet I/O	Active Ethernet I/O	Active Ethernet I/O	Active Ethernet I/O	Active Ethernet I/O
Comm. Interface	GPRS, 10/100M Ethernet	10/100M Ethernet	10/100M Ethernet	10/100M Ethernet	10/100M Ethernet	10/100M Ethernet
I/O Combination	4 AIs, 8 DIOs, 2 Relays	12 DIs, 8 DOs	8 DIs, 8 DOs, 4 DIOs	6 DIs, 6 Relays	8 AIs, 2 AOs	4 AIs, 12 DIOs
Control Protocol	Modbus/TCP, SNMP, OPC	Modbus/TCP, SNMP, OPC, Http-CGI	Modbus/TCP, SNMP, OPC, Http-CGI	Modbus/TCP, SNMP, OPC, Http-CGI	Modbus/TCP, SNMP, OPC, Http-CGI	Modbus/TCP, SNMP, OPC, Http-CGI
Local Intelligence	Click&Go	Click&Go	Click&Go	Click&Go	Click&Go	Click&Go
Alarm Function	SMS, E-mail, SNMP Traps, TCP/UDP Messaging	E-mail, SNMP Traps, TCP/UDP Messaging	E-mail, SNMP Traps, TCP/UDP Messaging	E-mail, SNMP Traps, TCP/UDP Messaging	E-mail, SNMP Traps, TCP/UDP Messaging	E-mail, SNMP Traps, TCP/UDP Messaging

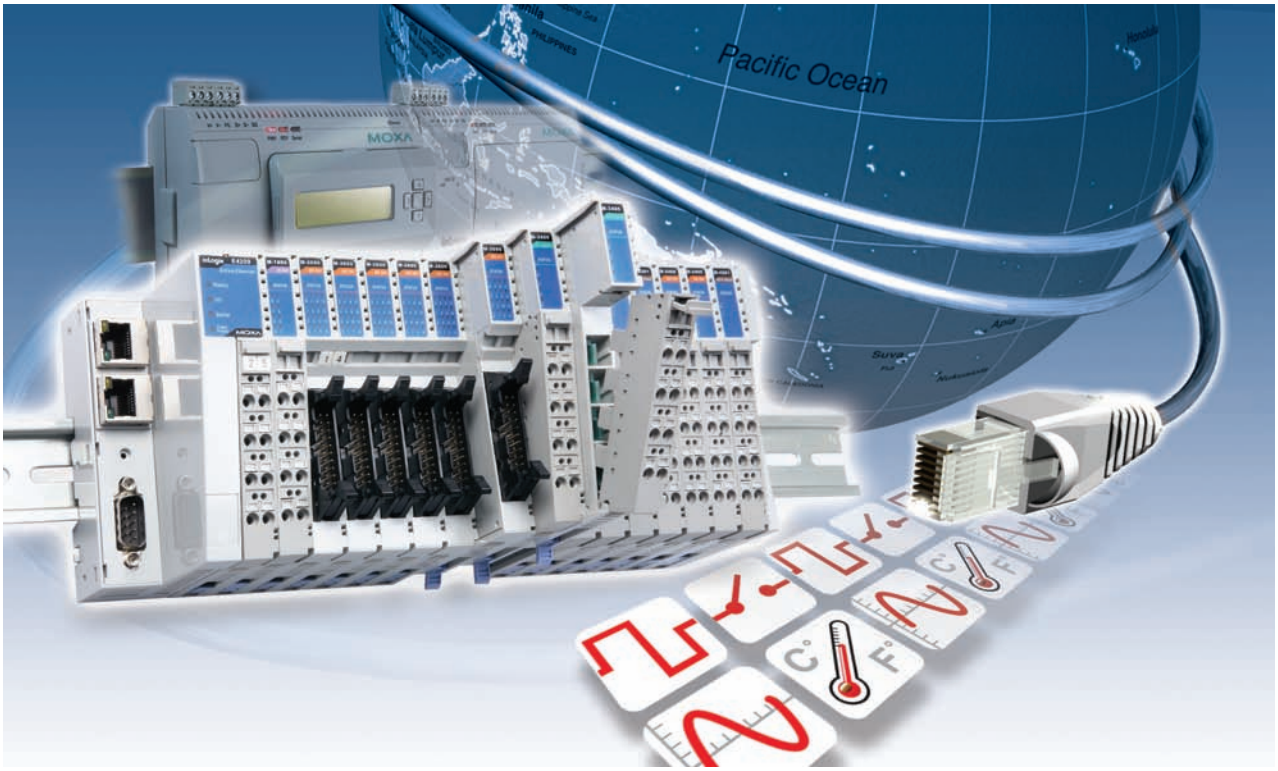
Model	ioLogik E2260	ioLogik E2262	ioLogik R2110	ioLogik R2140	ioMirror E3210
Category	Active Ethernet I/O	Active Ethernet I/O	RS-485 I/O	RS-485 I/O	Peer-to-Peer I/O
Comm. Interface	10/100M Ethernet	10/100M Ethernet	RS-485	RS-485	10/100M Ethernet
I/O Combination	4 DOs, 6 RTDs	4 DOs, 8 TCs	12 DIs, 8 DOs	8 AIs, 2 AOs	8 DIs, 8 DOs
Control. Protocol	Modbus/TCP, SNMP, OPC, Http-CGI	Modbus/TCP, SNMP, OPC, Http-CGI	Modbus/RTU	Modbus/RTU	---
Local Intelligence	Click&Go	Click&Go	---	---	---
Alarm Function	E-mail, SNMP Traps, TCP/UDP Messaging	E-mail, SNMP Traps, TCP/UDP Messaging	---	---	Alarm Channel with LED for Conn. Status

Modular Type I/Os

Model	ioLogik E4200	NA-4010	NA-4020	NA-4021
Category	Modular Active Ethernet I/O	Modular Ethernet I/O	Modular Serial I/O	Modular Serial I/O
Comm. Interface	Dual 10/100M Ethernet	10/100M Ethernet	RS-485	RS-232
Max. Expansion Capacity	16 slices	31 slices	31 slices	31 slices
Control Protocol	Modbus/TCP, SNMP, OPC	Modbus/TCP	Modbus/RTU	Modbus/RTU
Local Intelligence	Click&Go	---	---	---
Alarm Function	SMS, E-mail, SNMP Traps, TCP/UDP Messaging	---	---	---
SMS/GPRS Connectivity	Yes, with an ext. modem	---	---	---

Introduction to Industrial I/O

Intelligent, high-performance, reliable I/O modules for automation



Moxa's ioLogik series of industrial I/O products are intelligent, high-performance, reliable remote I/O solutions that bring the ease of open-standard Ethernet/TCP and serial RS-232/485 communications to automation applications, including data acquisition, and remote monitoring and alarm systems. The ioLogik series also offers greater flexibility by making it easy to install analog, digital, and temperature measurement instruments on the same mounting rack. The ioLogik industrial I/O series is ideal for both stand-alone and high-density mounting on a rack, in a cabinet, or on a panel, and can be easily adapted to industrial applications that require multiple I/O points.

Moxa's industrial I/O products can be divided into several categories, which include Ethernet I/O, Wireless I/O, and Serial I/O. Features such as built-in local intelligence (Click&Go) and a variety of form factors provide a number of options that users can choose from. The Ethernet I/O products, for example, can also be subdivided into Active Ethernet IO (ioLogik E2000 series), Modular Active Ethernet I/O (ioLogik E4200 with its slice type modules), and Peer-to-peer I/O (ioMirror E3210). Serial I/O can be subdivided into Stand-alone RS-485 I/O (ioLogik R2000 series), and Modular I/O (ioLogik NA-4020/4021 network adaptors with slice type modules). The Wireless I/O category currently contains one product, the ioLogik W5340 GPRS I/O.

Active Ethernet I/O

The Most Intelligent I/O for Remote Monitoring and Alarm Applications

ioLogik also supports Active Ethernet I/O, which is a new concept introduced by Moxa that offers proactive, condition-based reporting and the control of I/O devices used for PC-based data acquisition and control. The I/O status of an Active Ethernet I/O device can be reported and controlled automatically on-site based on user specified conditions. This report-by-exception approach, which is new to PC-based monitoring, requires far less bandwidth than traditional polling methods. Critical sensor data can be obtained immediately instead of being confined by the use of polling intervals. This makes network communication between a host computer and Active Ethernet I/O devices concise and efficient, and makes data transmission 20 times faster compared with traditional SCADA systems (50 ms compared to 1 sec).

The intelligence of Active Ethernet I/O is integrated by two parts:

- The programming-free local control logic of Click&Go, and
- Remote I/O control

Click&Go provides a programming-free, easy-to-learn IF-THEN-ELSE style of local I/O control that is capable of combining time-control or delivering TCP/UDP/SNMP Trap/e-mail/SMS messages with time stamp. In addition to Modbus/TCP, Active Ethernet I/O supports the familiar SNMP and HTTP-CGI protocols, giving IT engineers more options for obtaining remote I/O status and sending control commands. In addition, the Active OPC Server package makes it easy to link Active Ethernet I/O to SCADA systems.

Why Choose Active Ethernet I/O?

IA and IT-friendly Remote I/O Control

- Moxa's Active OPC Server can connect an ioLogik to SCADA systems
- Open-standard Modbus/TCP I/O control
- SNMP I/O control for IT-based network management
- CGI command I/O control for surveillance systems
- MXIO Library for WinCE/Linux, C++, VB/VC and .NET platforms

Intelligent Local I/O Control

- IF-THEN-ELSE style programming with no learning curve
- PLC-grade I/O control, timer, schedule, and register functions
- No need for third-party development tools, and no maintenance gaps
- Stand-alone operations require no host control
- Dramatic reduction in project implementation time

CLICK&GO™ LOGIC

Push Technology for Events and Alarms

- Event-based TCP/UDP messages, SNMP traps, e-mail, SMS, and CGI command output
- Real-time events with time stamp
- Moxa's Active OPC Server package
- Saves bandwidth with no polling effort

Solution-oriented Design

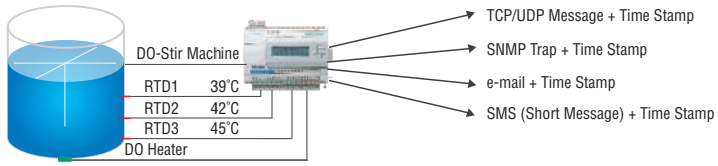
- Easy-to-expand slice-type I/O modules
- Intuitive Windows utility
- Peer-to-peer function
- Dual-LAN redundancy
- Optional LCM module

IA and IT-friendly Approaches to Remote I/O Control

In addition to Modbus/TCP, the I/O status of an Active Ethernet I/O device can be controlled in various ways. IT engineers can use SNMP and CGI, whereas IA engineers can use open-standard Active OPC Server. In addition, the MXIO library also offers programmers the benefit of fast implementation.

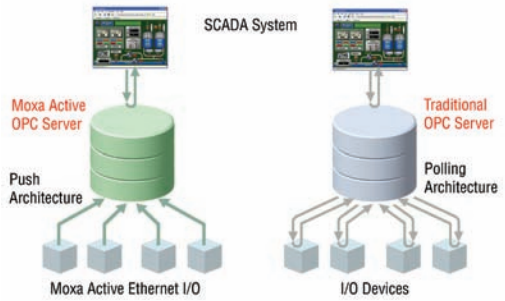
Push Technology for Events and Alarms

Active Messaging



Active Ethernet I/O can be used to generate alarms when an event (user-defined by Click&Go) is triggered. Standard TCP or UDP packets can be sent to a central host, SNMP traps can be sent to IT monitoring systems, and e-mail/SMS messages can be sent to the site maintainer.

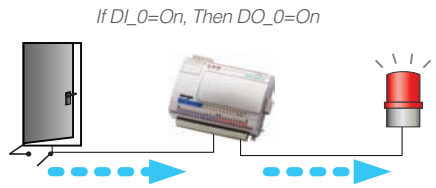
Active OPC Server Connection to SCADA



Active OPC Server Lite is a free software package provided by Moxa that operates as an OPC driver for an HMI or SCADA system. Active OPC Server Lite offers seamless connection from Moxa's ioLogik series products to SCADA systems with 7 times the normal response, 50 times faster tag installation, and an 80% reduction of network bandwidth usage compared with other traditional OPC packages on the market.

Intelligent Local I/O Control

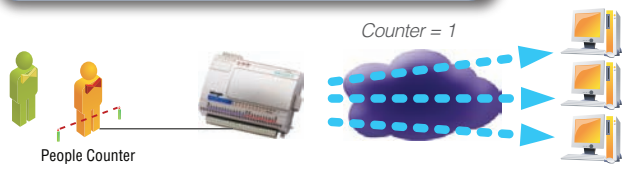
Local Alarm & I/O Control



- Local intelligence
- No programming

Active Ethernet I/O can be used for simple output control that is triggered by input status, without a PC controller. For example, a door sensor can be configured to trigger an alarm. Configuration is done through intuitive If/Then statements, with no programming required.

Instant Event Reporting by Input Status

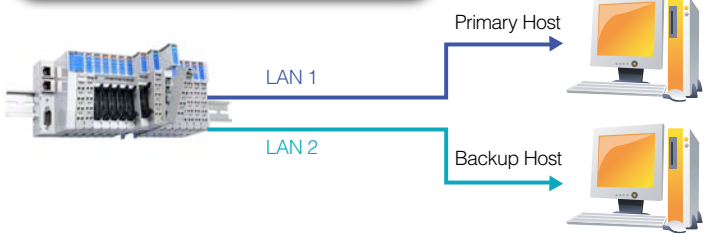


- Improves data acquisition and control system efficiency
- More accurate and timely measurements to prevent data loss

Instead of relying on host computers that continually poll I/O devices for data, Active Ethernet I/O devices can proactively report sensor status using TCP or UDP messages. Proactive messaging allows much faster notification of I/O events and generates much lower network and CPU loads. Message content is fully customizable, and up to 10 simultaneous destinations are supported.

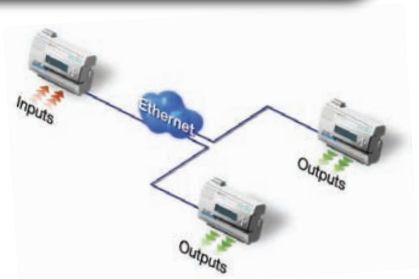
Solution-oriented Design

Dual-LAN Redundancy



The ioLogik E4200 series of Modular Active Ethernet I/O products come with dual network interfaces, which have separate MACs and IP addresses to connect to different network segments. Redundancy can be easily implemented to improve system reliability by allowing hosts located on different networks to control or monitor your system.

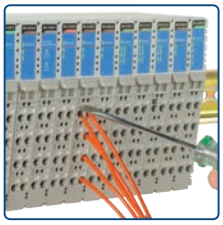
Peer-to-Peer Communication over Ethernet



The ioMirror E3000 series of Ethernet I/O products are designed as cable replacement solutions that send input signals to remote outputs over an IP network. ioMirror products can be used to connect remote sensor signals to PLC controllers, DCS systems, or display devices over a network, without installing additional signal wires.

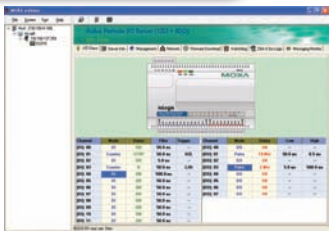
Easy Expansion with Slice-type Modules

Slice Type I/O Modules


Spring Type Terminal Block

The ioLogik 4000 provides spring type, removable terminal blocks (RTBs) that allow you to preserve field wiring before replacing an I/O expansion module. Each I/O expansion module can be replaced quickly and easily.

Intuitive Windows Utility



ioLogik remote I/O products come with a very user-friendly Windows utility that includes remote configuration, firmware updates, and I/O testing and monitoring functions. These functions can save you many hours of installation and troubleshooting, and all settings can be saved to a file for future reference.

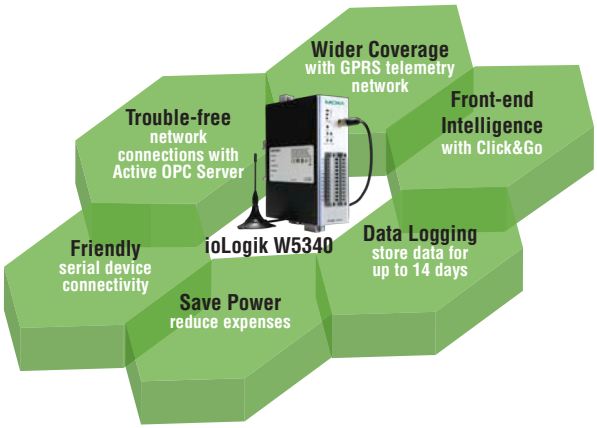
Optional LCD Module

The ioLogik 2000 series of stand-alone remote I/O products provides an optional LCD module for on-site management and configuration. The unique display module can display network and I/O settings. You can change network settings to ensure the speed of installation and future maintenance.

Wireless I/O

Integrating I/O and GPRS Communications

Active GPRS I/O is a highly integrated solution that combines GPRS communications, front-end intelligence, and a front-end data logging function for information analysis and prediction. By using GPRS technology, the ioLogik W5000 series gives remote monitoring applications maximum coverage. The W5000 series products come with one 3-in-1 serial port (RS-232/422/485) to connect field serial devices such as meters, analyzers, and instruments. The ioLogik W5000 is a perfect fit for remote monitoring and alarm systems for which wired connections are difficult or impossible, such as unmanned site monitoring, riverside monitoring, and pipeline monitoring.



Trouble-free Connections to GPRS Networks

Managing dynamic IP addresses for automation projects that require setting up connections to the GPRS network can be a big headache for engineers. Thanks to Active GPRS I/O with Push Technology and Active OPC Server, dynamic IP addresses can be managed between the Active GPRS I/O product and the Active OPC Server. In this case, SCADA programs can receive data from the Active OPC Server without putting additional effort into managing IP addresses.

Most traditional solutions use DDNS or a purchased service package from an MVNO (Mobile Virtual Network Operator) to make IP management easier. GPRS networks usually offer a dynamic IP environment with the IP address assigned by the cellular service provider, but it is difficult to poll a GPRS device's data in a dynamic IP environment. Even with DDNS technology, SCADA projects still need to allocate resources to manage the DDNS server.

Moxa's Active OPC Server makes it easy to install an ioLogik W5000 in a GPRS dynamic IP environment, and since remote Active GPRS I/O automatically establishes communication with Active OPC Server, all remote Active GPRS I/Os can be managed by one centralized Active OPC Server, which itself has a fixed IP address. Active OPC Server receives and registers the ioLogik W5000's IP address and receives tag updates, and application programs can poll data via Active OPC Server without exerting any effort on IP management.

Front-End Intelligence for Handling Events

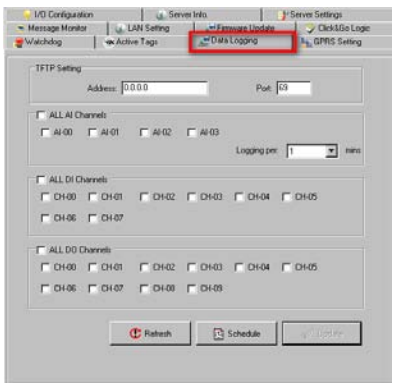
The Click&Go software package provides Active GPRS I/O with front-end intelligence for event response and alarms. When a pre-defined event is triggered, a variety of alarms, such as SMS, email, TCP/UDP packets, and SNMP Trap, can be sent actively, and depending on the type of configuration you're using, real time stamps can also be attached.

Friendly Serial Device Connectivity

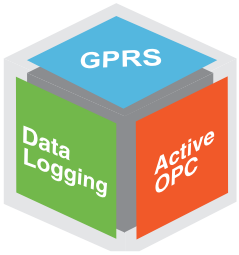
Active GPRS I/O devices are equipped with one 3-in-1 (RS-232/485/422) serial port. When GPRS is on line, the Active GPRS I/O device will establish a TCP Client connection with the PC software, and then use this transparent data tunnel to poll or read remote meters. Thanks to the Active GPRS I/O device's TCP Client support, dynamic IP addresses are no longer a problem.

Data Logging—Store up to 14 Days of I/O Records

ioLogik Active GPRS I/O devices come with an external SD card slot that can be used to store I/O status, with each day's records stored in a separate file. The files are stored in .CSV file format and use TFTP protocol for exchanging files between the PC and Active GPRS I/O device, making it easy for users to import the records into a database and display in chart format.



The Benefits of Integration



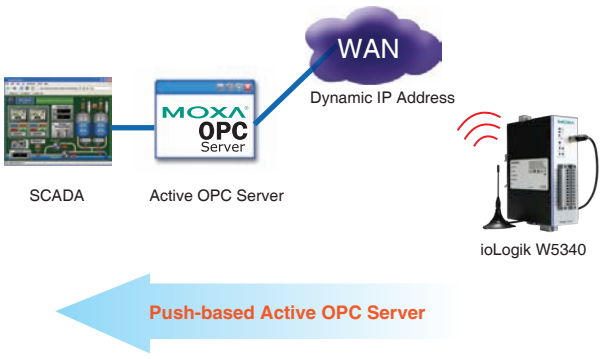
- Easy to Install
- Extra Power Savings
- Caller ID for Security
- Needs only a Sliver of Bandwidth

ioLogik Active Wireless I/O provides an integrated solution with a number of important benefits.

Easy Installation

By supporting Moxa's powerful Active OPC Server, Active GPRS I/O products can be easily integrated with your SCADA system. Moxa's Active OPC Server with non-polling architecture supports the standard OPC protocol, but also offers active (or "push") communication between Moxa's ioLogik series of Active GPRS I/O products and HMI/SCADA systems with instant I/O status.

Unlike the fixed IP requirement for Ethernet I/O with a traditional OPC server, Active OPC Server and ioLogik products deliver the flexibility of using dynamic IP addresses. The ioLogik product can connect directly to the Active OPC Server instead of being polled, which makes the dynamic IP configuration and WAN Access of the GPRS I/O possible. As far as traditional data acquisition applications are concerned, I/O devices are not capable of using this approach. In addition, the flexibility of being able to connect through a firewall is a useful feature.



Active OPC Server and ioLogik series products offer "Auto Tag Generation" to eliminate the need to specify target IP addresses, I/O channels, and data formats one by one or edit and import configuration text files. Instead, Active OPC Server creates the tags for the target ioLogik automatically. Simply select the channels that need to be updated, and the tags are generated and configured without needing any input from the user. Generally speaking, tag generation is 50 times faster on Active OPC Server than with traditional OPC server packages, and training on how to install and configure the OPC server is no longer necessary.

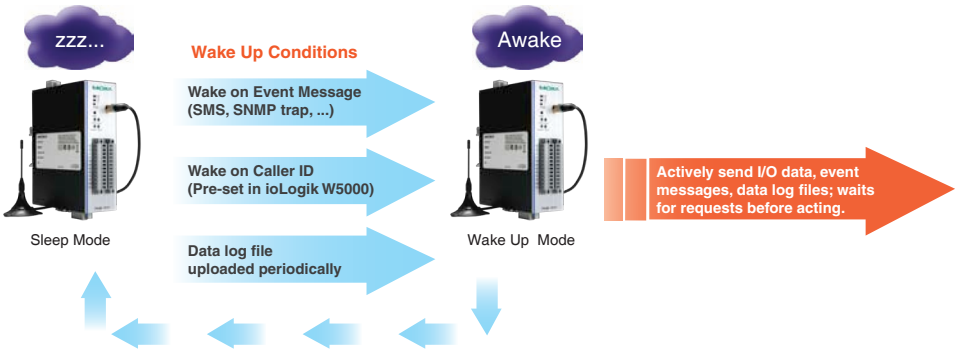
Low Power Consumption and Sleep Mode

Due to the high integration of GPRS communication, I/O functions, and data-logging, the power consumption of Moxa's integrated solution is half that of using separate solutions. You will be able to build a system that uses a smaller solar power panel and lower battery capacity. For example, the ioLogik W5340 provides the optimal solution for riverside monitoring applications, such as monitoring water flow to prevent flood disasters, or monitoring water quality to protect the supply of drinking water. This solution's power saving feature requires less power, even when the power is supplied by a solar panel or battery. It also provides a data logging function for keeping the necessary data on an SD card, and you can receive active messages automatically when a pre-defined condition is triggered.

When sleep mode is activated, the ioLogik W5340 will turn off GPRS communications, but keep the I/O function working, and the status of all I/O activity will be recorded in a data Log file. The data log function will create a new file every day and can be configured to upload the latest data to a host every night at midnight. In addition to ensuring that all data is sent to your analysis system, you can also extend your I/O operation while using backup battery power.

Secure Wake on Call

There are three ways to wake up an ioLogik Active GPRS I/O. The first is wake up by event, such as with an active message, SMS, email, or SNMP Trap. The second is wake on call. In this case, the ioLogik W5340 can be woken by a secure caller ID. In sleep mode, the ioLogik W5340 will disconnect all communications except GSM. The only way you can connect is with wake on call. If your caller ID is configured in the ioLogik W5340, it will wake up from sleep mode. Once the ioLogik W5340 receives a call, it will identify the caller ID and then hang up the phone without incurring any expense. If the caller ID is in the authorized list, a connection to the Active OPC Server will be initiated and a communication channel will be initiated using the IP address. Since your caller ID must be authorized, you can ensure that your data is secure. The third method is to configure the data log system to upload your data every night at midnight.



Stay Alive with a Small Bandwidth

Compared with the traditional "polling" architecture, which results in a longer response time since more network bandwidth is used, the ioLogik Active GPRS I/O uses "push" technology to report active messages when predefined events occur. This event-driven logic improves the I/O response time and results in I/O access that is more precise. In addition, you will see a big reduction in your communication expense since the system uses a limited amount of bandwidth, and this innovative push-based architecture reduces CPU loading, which means that less maintenance is required and lower level hardware devices can be used.

Serial I/O

Linking Input and Output Signals over a Serial Connection

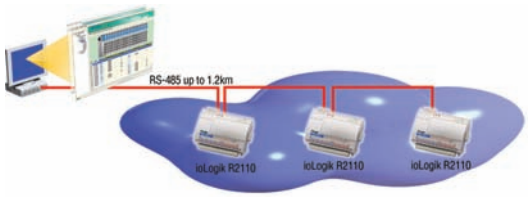
The ioLogik R2000/4000 series was designed for system integrators to acquire and control remote digital and analog devices over both RS-232 and RS-485 connections. Different types of digital on/off devices can be controlled, including proximity switches, mechanical switches, push buttons, optical sensors, LEDs, and light switches. In addition, different types of analog devices can be controlled, including sensors that read pH, conductivity, temperature, humidity, pressure, and flow, as well as actuators and valves. ioLogik R2000/4000 series products can be used with the standard Modbus protocol, and SCADA software or the MXIO DLL library can be used to access the server.

More Choices for Stand-alone and Modular Solutions

The ioLogik R2000 is designed as a stand-alone serial I/O solution. Two model groups are available. The ioLogik R2110 has 12 DIs and 8 DOs, and the ioLogik R2140 has 8 AIs and 2 AOs. In addition to being installed separately, two or more ioLogik R2000 devices can be connected together via a system bus that includes sharing the system's power. The modular ioLogik 4000 system consists of a network adaptor plus up to 31 slice-type I/O modules. The ioLogik connects to the host controller via RS-485, and the ioLogik NA-4020 and NA-4021 support individual RS-485 and RS-232 connections.

Easy Remote Management

Traditionally, it was difficult for users to update firmware over RS-485. Moxa now provides an easy method for updating firmware over an RS-485 network that allows users to perform remote firmware updates, reducing maintenance time and cost.



Snap-On LCD Module

Traditionally, a PC was required to configure a remote I/O. To get around this, Moxa now offers an optional snap-on LCD module to give users a much easier way to configure and monitor ioLogik R2000 series products. The LCD module is hot-pluggable, which means that it can be installed or removed without turning off the server.

Common Specifications for ioLogik E2000 Series Active Ethernet I/O Products

LAN

Ethernet: 1 x 10/100 Mbps, RJ45

Protection: 1.5 KV magnetic isolation

Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP (MIB for I/O and Network), HTTP, CGI, SNTP

Serial Communication

Interface: RS-485-2w: Data+, Data-, GND

Serial Line Protection: 15 KV ESD for all signals

Serial Communication Parameters

Parity: None

Data Bits: 8

Stop Bits: 1

Flow Control: None

Baudrate: 1200 to 115200 bps

Protocol: Modbus/RTU

Power Requirements

Power Input: 24 VDC nominal, 12 to 48 VDC

Power Consumption: 282 mA typical @ 24 VDC

Physical Characteristics

Wiring: I/O cable max. 14AWG

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

EMI: FCC Part 15, CISPR (EN55022) class A

EMS: IEC 61000-4, IEC 61000-6

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

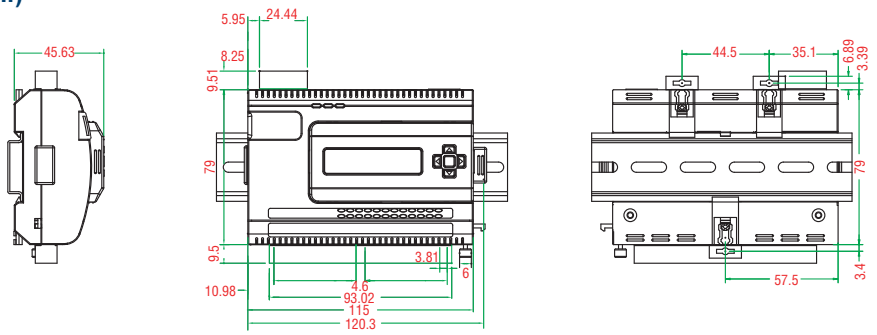
Vibration: IEC 60068-2-6

Warranty

Warranty Period: 2 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Side View | Front View | Rear View

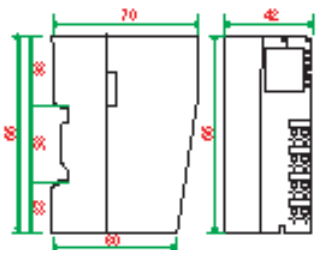
Selection Guide for Active Ethernet I/O Products

I/O / Model	Input				Output			DIO
	Digital	Analog	RTD	Thermocouple	Digital	Relay	Analog	
E2210	12	---	---	---	8	---	---	---
E2212	8	---	---	---	8	---	---	4
E2214	6	---	---	---	---	6	---	---
E2240	---	8	---	---	---	---	2	---
E2242	---	4	---	---	---	---	---	12
E2260	---	---	6	---	4	---	---	---
E2262	---	---	---	8	4	---	---	---

Dimensions of ioLogik 4000/E4200 Series Modular I/O Products

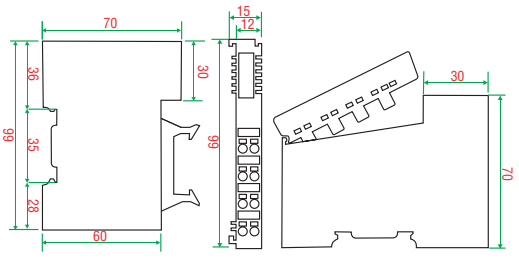
Dimensions (unit = mm)

I/O Network Adaptor



Side View | Front View

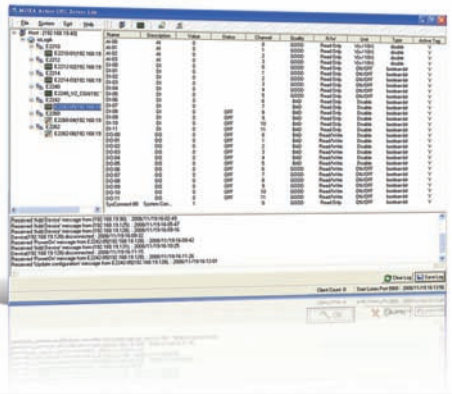
I/O Module



Side View | Front View | Removable View

Active OPC Server Lite

Seamlessly connect ioLogik to your SCADA system



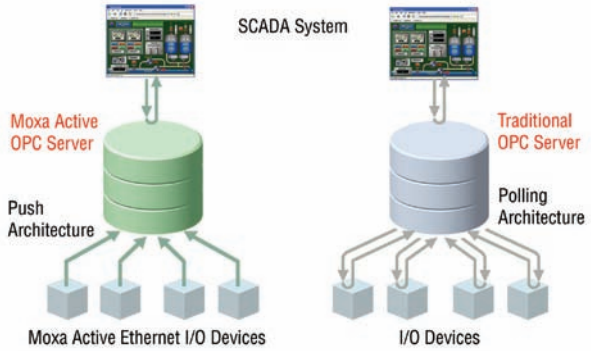
- **OPC DA 3.0 supported**
- **Event-driven tag update**
  - Save 80% on network bandwidth
  - I/O response that's 7 times faster
- **Patented automatic tag generation**
- **Firewall-friendly connection from remote ioLogik devices**
  - Allows remote I/O to use dynamic IP
  - Allows remote I/O to use private IP
- **Download free from Moxa's website**

Introduction

Active OPC Server Lite is a software package provided by Moxa that operates as an OPC driver for an HMI or SCADA system. It offers seamless connection from Moxa's ioLogik series products to SCADA systems, including Wonderware, Citect, and iFix. Active OPC Server Lite meets the latest standard of OPC DA 3.0, which allows connections to various kinds of devices and host OPC machines.

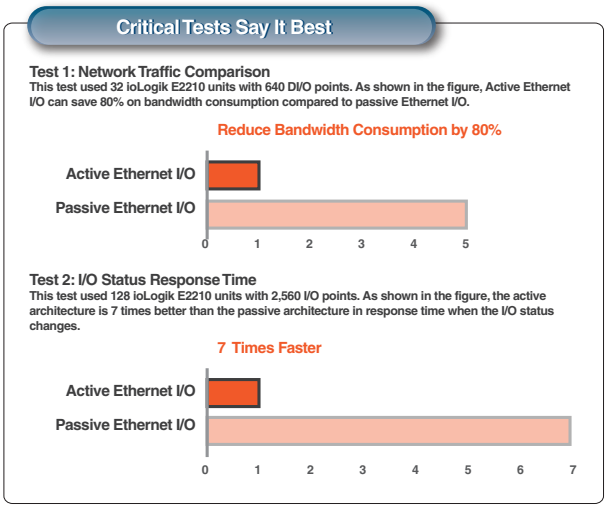
Smart I/O Connection—Migrating from "Pull" to "Push"

General OPC servers typically use the "poll/response," or so-called "pull" architecture, to connect to Ethernet I/O devices, which involves an HMI/SCADA system continuously sending out commands to collect relevant data. Moxa's Active OPC Server, with its non-polling architecture, supports the standard OPC protocol, but also offers active (or "push") communication with Moxa's ioLogik series of Active Ethernet I/O products to HMI/SCADA systems, providing instant I/O status reports.



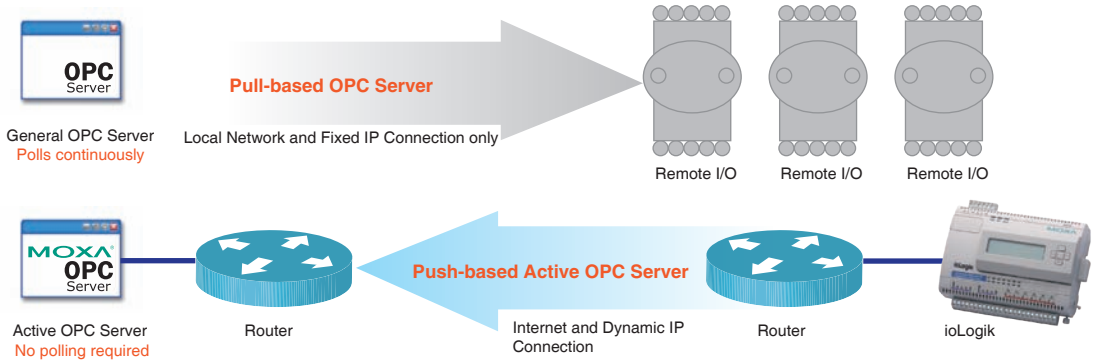
I/O Response that's 7 Times Faster and Provides 80% off Bandwidth Usage with Event-driven Tag Updates

Adding additional I/O channels will tend to bog down an HMI/SCADA system's operation, resulting in a longer response time , and high network bandwidth occupation, all because of the traditional "pull" architecture. Active tags created by Active OPC Server Lite and ioLogik series products report the I/O status only when it changes. This type of event-driven tag status update results in an I/O response time that is 7 times faster than other OPC Server packages (using a testing environment with 2,560 I/O channels). In a different test of network bandwidth usage, Active OPC Server Lite and the ioLogik caused an apparent 80% reduction in network traffic. The end result is that I/O access is more precise, and the cost of communicating with remote I/O devices is substantially lower, especially when the remote site has limited bandwidth (e.g., satellite, microwave, and cellular communication). At the same time, the CPU usage of the SCADA/ HMI system is also reduced by 35% with this innovative push-based architecture, so that less maintenance effort and lower level hardware devices can be implemented.



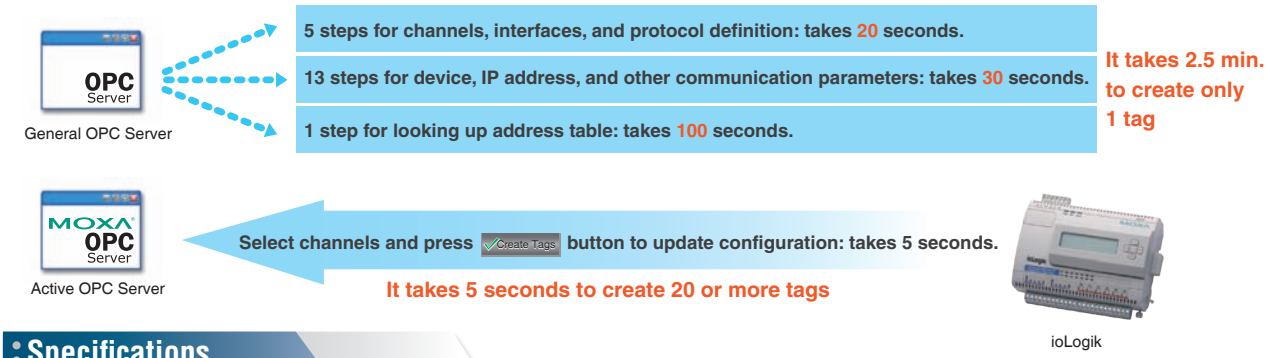
Dynamic IP/WAN Connection

Unlike the fixed IP requirements of Ethernet I/O with a traditional OPC server, Active OPC Server Lite and ioLogik products provide the flexibility of configuring the ioLogik to use dynamic IP addresses. The ioLogik connects directly to the Active OPC Server Lite instead of being polled, which makes dynamic IP addressing and WAN Access to the Ethernet I/O device possible, and adds even greater flexibility by allowing connections across firewalls. I/O devices for traditional data acquisition applications are not capable of using this approach.



Automatic Tag Generation

Active OPC Server Lite and ioLogik series products support "Auto Tag Generation," which eliminates the headache of specifying target IP addresses, I/O channels, and data formats one by one, or editing and importing configuration text files, since Active OPC Server Lite creates the tags for the target ioLogik automatically. Simply select the channels that you need to update, and the tags are generated and configured automatically. Generally speaking, tag generation is 50 times faster with Active OPC Server Lite than with traditional OPC server packages. One of the biggest payoffs is that users will no longer need to be trained to install and configure your OPC.



Specifications

Hardware Requirements

CPU: Intel Pentium (Pentium 4 or above)
RAM: 512 MB (1024 MB recommended)
Network Interface: 10/100Mb Ethernet

Software Requirements

Operating System: Microsoft Windows 2000/XP/2003
Editor (optional): Microsoft Office 2003 (Access 2003) or above

OPC Server Specifications

OPC Data Access: 1.0a, 2.0, 2.05a, 3.0
Max. No. of Tags: 256

Ordering Information

Available Models

Active OPC Server Lite: Free software package for integrating with SCADA/HMI systems

Can be used with the following products

Active Ethernet I/O: ioLogik E2210/E2212/E2214/E2240/E2242/E2260/E2262 Series
Modular Active Ethernet I/O: ioLogik E4200
Cellular GPRS I/O: ioLogik W5340

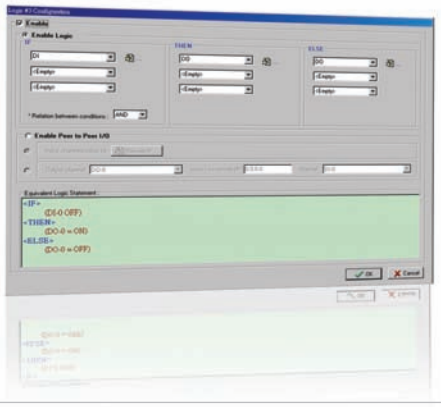
Software Versions and Model Support Table

ioLogik Model Name	E2210	E2212	E2214	E2240	E2242	E2260	E2262	E4200*	W5340*
Active OPC Server Lite	V1.0↑	V1.0↑	V1.0↑	V1.1↑	V1.1↑	V1.1↑	V1.1↑	V1.3↑	V1.2↑
Configuration Utility	ioAdmin V3.0↑	ioAdmin V3.0↑	ioAdmin V3.0↑	ioAdmin V3.1↑	ioAdmin V3.1↑	ioAdmin V3.1↑	ioAdmin V3.1↑	Modular ioAdmin V1.1↑	ioAdmin V3.2↑
Firmware	V3.0↑	V3.0↑	V3.0↑	V3.0↑	V3.0↑	V3.0↑	V3.0↑	V1.1↑	V1.0↑

*Note: The version numbers for these models are preliminary. Please see Moxa's website for the most up-to-date information.

Click&Go

Easy and intuitive I/O control configuration for the ioLogik Active Ethernet I/O



- PC-free solution with local intelligence
- Programming-free IF-THEN-ELSE logic reduces setup time
- Time stamped active alarm report with TCP, UDP, SNMP Trap, email, SMS, or CGI commands
- Time-based scheduler and timer control
- Input-to-output control over IP with peer-to-peer and remote action

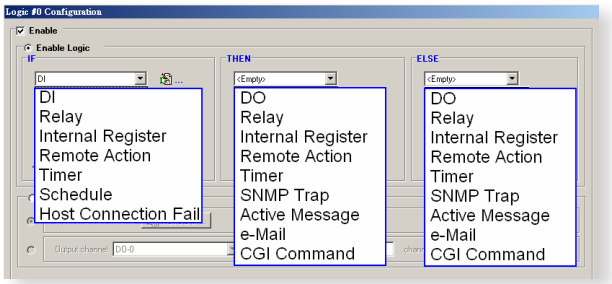
Introduction

PC-free Alarm and Control Solution

Moxa's own Click&Go™ logic turns your ioLogik E2000, E4200, and W5340 remote I/O unit into a compact and powerful RTU by allowing you to configure basic input to output controls, even if users have no programming knowledge. Click&Go™ is such a powerful software solution that when used with the ioLogik series products, Click&Go enables these remote I/O to have local control ability working without the control of a remote PC, or to keep operating when the remote PC or the network is down. Besides the basic local I/O control, alarm messages such as SNMP traps, TCP/UDP messages, e-mails and CGI commands can be triggered when there is an event.

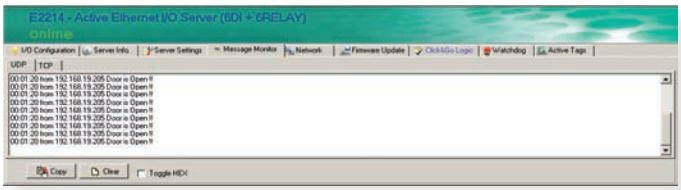
Set Up Your System with Just a Few Clicks

Click&Go™ is a programming-free function set solution that displays the control options you need in an easy to access drop-down menu. This means that you are never more than a few mouse clicks away from getting your system set up and ready to go without a compiler or a debugger. Click&Go's intuitive IF-THEN-ELSE logic shortens the learning curve and deployment time.



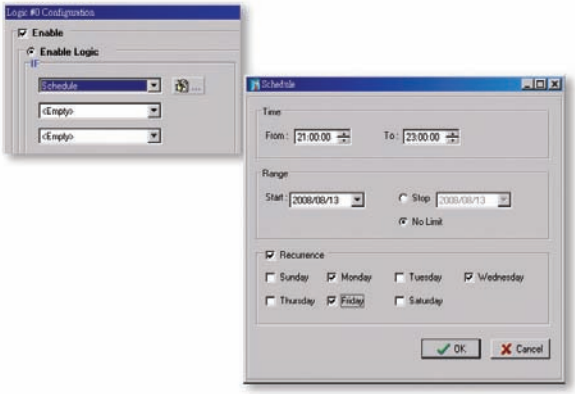
Active Alarm Reports Make Your Monitoring System Real-time

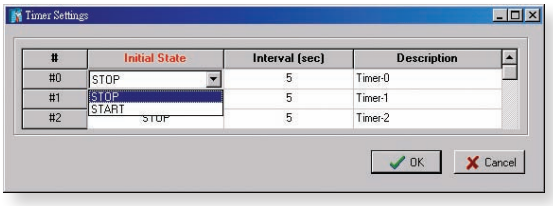
Click&Go™ is designed to provide a simple configuration platform and real-time monitoring capability. For any alarm system, fast response and real-time monitoring is very important. Click&Go™ supports various active communication methods, including TCP, UDP, SNMP Trap, email, and CGI commands, making it very easy to integrate Click&Go™ with any monitoring system. Click&Go™ also supports SNTP for time alignment, making sequential and historical alarm tracking possible. In addition, users can define the content of alarm messages themselves, making Click&Go™ a perfect solution for system users.



Click&Go™ Provides Time-based Scheduler and Timer Control

Click&Go™ can be scheduled to perform user defined tasks such as output control, remote actions, and active messaging. This function is useful when applied to energy savings, lighting control, and water pumping systems. The timer function allows users to set a delay period for actions, which is particularly useful when used with alarm systems for which users need an authentication period to avoid false alarms.





Click&Go™ Function Comparison

Click&Go™ is now available on all ioLogik products, recent function improvements are shown in the table at the right.

Improvements in Programming Method and Rules

	Programming Method	Programming Rules
Click&Go V1.x	IF-THEN	16 Rules
Click&Go V2.x	IF-THEN-ELSE	24 Rules

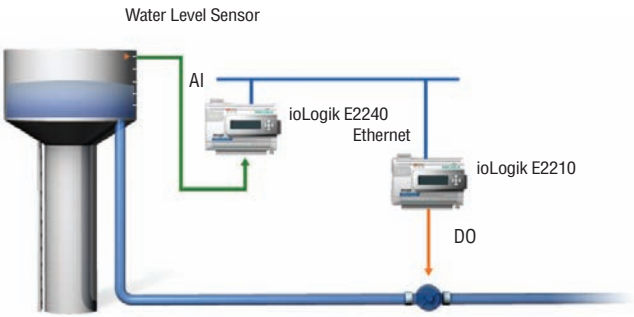
Function Support

	Click&Go V1.0	Click&Go V1.1	Click&Go V2.x
Input Monitor and Output Control	√	√	√
Counter Monitor and Reset	√	√	√
Timer Trigger	√	√	---
Delay Timer	---	√	---
Timer	---	---	√
Internal Register	---	√	√
Remote Action	---	---	√
Schedule	---	---	√
SNMP Trap	√	√	√
Active Messaging	√	√	√
Email	√	√	√
CGI Commands	---	---	√

Input-to-Output Control over IP Networks

Click&Go™ enables direct input-to-output control over IP networks, without the need for additional PCs. That is, when used in pairs, the ioLogik E2000 units can talk directly to each other, and digital inputs can be reproduced at a remote location over the network. Local analog inputs can also be referenced for remote digital outputs. A typical application can be found in water pumping systems where analog inputs that measure the water level are referenced to activate the pumps On/Off control. By cross referencing the scheduler, less energy will be used to operate the water pumping system.

Energy Savings for Water Pumping Systems



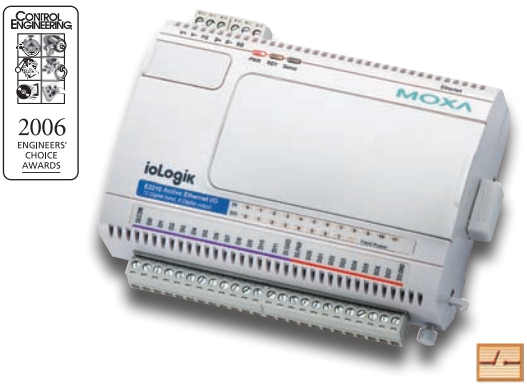
Click&Go™ Support Versions

To use the latest version of Click&Go™, simply upgrade the ioLogik's firmware. But first, be sure to download the latest configuration utility before proceeding to update the firmware.

ioLogik Model	E2210	E2212	E2214	E2240	E2242	E2260	E2262	E4200	W5340
Configuration Utility	ioAdmin V3.0↑	ioAdmin V3.0↑	ioAdmin V3.0↑	ioAdmin V3.1↑	ioAdmin V3.1↑	ioAdmin V3.1↑	ioAdmin V3.1↑	modular ioAdmin V1.0↑	ioAdmin V3.2↑
Firmware	V3.0↑	V3.0↑	V3.0↑	V3.0↑	V3.0↑	V3.0↑	V3.0↑	V1.0↑	V1.0↑

ioLogik E2210

Active Ethernet I/O with 12 digital inputs and 8 digital outputs



- Instant event messaging by TCP/UDP/email/SNMP-trap
- Easy-to-use Click&Go™ Logic for local output control
- 12-point 24 VDC digital input with counter
- 8-point 24 VDC digital output with pulse output
- PC-based configuration utility and web console
- I/O control over Modbus/TCP and SNMP protocol
- Windows/WinCE VB/VC.NET and Linux C APIs
- Peer-to-Peer I/O without controller

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

Simple Applications without Programming

The ioLogik E2210 can convert a trigger event result directly into a digital alarm output. This can be set up using the ioAdmin UI to define an IF-THEN-ELSE logic rule, eliminating the need to write programs for PCs or controllers.

Software Event Counter Input and Pulse Output

Each digital input can be independently configured for DI or Event Counter mode, and output can be independently configured for DO or Pulse Output mode.

Specifications

LAN

Ethernet: 1 x 10/100 Mbps, RJ45
Protection: 1.5 KV magnetic isolation
Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP (MIB for I/O and Network), HTTP, CGI, SNTP

Serial Communication

Interface: RS-485-2w: Data+, Data-, GND
Serial Line Protection: 15 KV ESD for all signals

Serial Communication Parameters

Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 1200 to 115200 bps
Protocol: Modbus/RTU

Digital Input

Channels: 12, source type
Sensor Type: NPN, Dry contact
I/O Mode: DI or Event Counter (up to 900 Hz)
Dry Contact:
• Logic 0: short to GND
• Logic 1: open
Wet Contact:
• Logic 0: 0 to 3 VDC
• Logic 1: 10 to 30 VDC (DI COM to DI)
Common Type: 12 points per COM
Isolation: 3K VDC or 2K Vrms
Counter/Frequency: 900 Hz
Digital Filtering Time Interval: Software selectable
Over-voltage Protection: 36 VDC

Digital Output

Channels: 8, sink type, 36 VDC, 200 mA
I/O Mode: DO or Pulse Output (up to 100 Hz)
Pulse Wave Width/Frequency: 10 ms/100 Hz
Over-voltage Protection: 45 VDC
Over-current Limit: 400 mA (typical)
Over-temperature Shutdown: 175°C (min.)
Output Current Rating: Max. 200 mA per channel
Isolation: 3K VDC or 2K Vrms

Power Requirements

Power Input: 24 VDC nominal, 12 to 48 VDC
Power Consumption: 282 mA typical @ 24 VDC

Physical Characteristics

Wiring: I/O cable max. 14AWG
Dimensions: 115 x 79 x 45.63 mm (4.53 x 3.11 x 1.8 in)
Weight: 215 g

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

EMI: FCC Part 15, CISPR (EN55022) class A
EMS: IEC 61000-4, IEC 61000-6
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Warranty

Warranty Period: 2 years
Details: See www.moxa.com/warranty

Pin Assignment

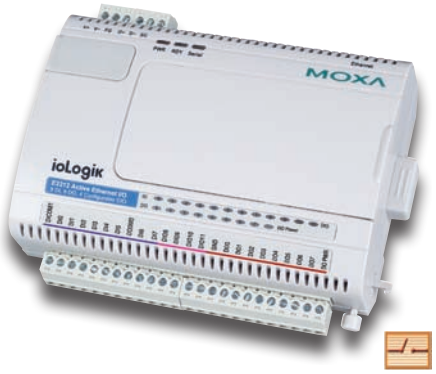
I/O (left to right)

Ordering Information

ioLogik E2210: Active Ethernet I/O with 12 digital inputs and 8 digital outputs
LDP1602: LCD module with 16 x 2 text display and 5 buttons

ioLogik E2212

Active Ethernet I/O with 8 digital inputs, 8 digital outputs, and 4 configurable DIO



- Selectable digital I/O combination (by software)
- Accepts PNP or NPN sensors
- DI counter saved automatically when power shuts off
- Instant event messaging by TCP/UDP/email/SNMP trap
- Easy-to-use Click&Go™ Logic for local output control
- PC-based configuration utility and web console
- I/O control over Modbus/TCP and SNMP protocol
- Windows/WinCE VB/VC.NET and Linux C APIs
- Peer-to-Peer I/O without controller

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

Flexible Digital Input/Output Configuration

The ioLogik E2212 provides system integrators with the flexibility to handle various field demands with channels that can be configured by software for input or output operation. You can configure the I/O channels to suit your needs, for combinations such as 12-inputs/8-outputs, 8-inputs/12-outputs, or 10-inputs/10-outputs.

Single Ethernet DIO that Accepts 3 Sensor Types

Unlike traditional Ethernet I/O products, the ioLogik E2212 can connect to dry contact, PNP, and NPN sensors at the same time. You can choose the sensor type based on your wiring approach.

Specifications

LAN

Ethernet: 1 x 10/100 Mbps, RJ45
Protection: 1.5 KV magnetic isolation
Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP (MIB for I/O and Network), HTTP, CGI, SNTP

Serial Communication

Interface: RS-485-2w: Data+, Data-, GND
Serial Line Protection: 15 KV ESD for all signals

Serial Communication Parameters

Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 1200 to 115200 bps
Protocol: Modbus/RTU

Digital Input

Channels: 8, source/sink selectable
Sensor Type: 2 6-point groups for NPN/PNP type
I/O Mode: DI or Event Counter (up to 900 Hz)
Dry Contact:
• Logic 0: short to GND
• Logic 1: open
Wet Contact: (For Source Type)
• Logic 0: 0 to 3 VDC
• Logic 1: 10 to 30 VDC (DI COM to DI)
Common Type: 6 points per COM
Isolation: 3K VDC or 2K Vrms
Counter/Frequency: 900 Hz, power off storage
Digital Filtering Time Interval: Software selectable
Over-voltage Protection: 36 VDC
Poweroff Counter Memory: 48 bytes

Digital Output

Channels: 8, sink type, 36 VDC, 200 mA
I/O Mode: DO or Pulse Output (up to 100 Hz)
Pulse Wave Width/Frequency: 10 ms/100 Hz
Over-voltage Protection: 45 VDC
Over-current Limit: 400 mA (typical)
Over-temperature Shutdown: 175°C (min.)
Output Current Rating: Max. 200 mA per channel
Isolation: 2K Vrms or 3K VDC (Magnetic)

DI/DO Configurable Channels

Channels: 4
I/O Mode:
• DI or Event Counter (up to 900 Hz)
• DO or Pulse Output (up to 100 Hz)

Power Requirements

Power Input: 24 VDC nominal, 12 to 48 VDC
Power Consumption: 282 mA typical @ 24 VDC

Physical Characteristics

Wiring: I/O cable max. 14AWG
Dimensions: 115 x 79 x 45.63 mm (4.53 x 3.11 x 1.8 in)
Weight: 210 g

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

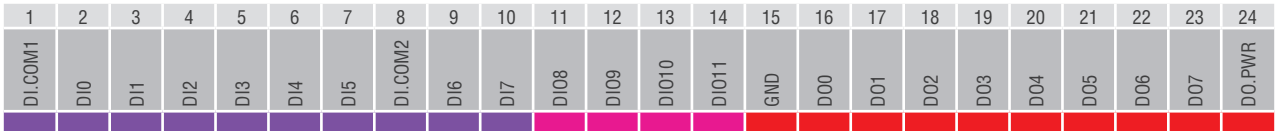
EMI: FCC Part 15, CISPR (EN55022) class A
EMS: IEC 61000-4, IEC 61000-6
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Warranty

Warranty Period: 2 years
Details: See www.moxa.com/warranty

Pin Assignment

I/O (left to right)

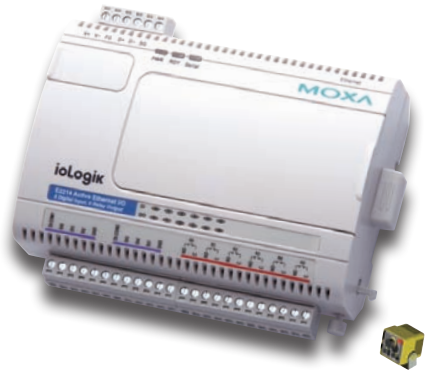


Ordering Information

ioLogik E2212: Active Ethernet I/O, with 8 digital inputs, 8 digital outputs, and 4 DIOs
LDP1602: LCD module with 16 x 2 text display and 5 buttons

ioLogik E2214

Active Ethernet I/O with 6 digital inputs and 6 relay outputs



- 6 DIs supporting PNP, NPN, and dry contact
- 6 Form A relay outputs (Normal Open)
- Relay specifications: 5 A @ 250 VAC, 5 A @ 30 VDC
- Instant event messaging by TCP/UDP/email/SNMP-trap
- DI and Relay counter saved when the power is shut off
- PC-based configuration utility and web console
- Power On default relay status setting with sequence
- Easy-to-use Click&Go™ Logic for local output control
- Windows/WinCE VB/VC.NET and Linux C APIs
- I/O control over Modbus/TCP and SNMP protocol

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

Remote Ethernet Relay Control

The ioLogik E2214 is a stand-alone Active Ethernet I/O product with 6 digital inputs and 6 relay outputs. The DIN-Rail mountable E2214 can be connected to digital switches, alarm lights, buzzers, and warning sirens over Ethernet and IP-based networks. The ioLogik E2214 also records the built-in relay output usage counter. Even when a sudden power failure is encountered, the ioLogik E2214 will still be able to record the relay output usage counter in its internal memory before the power shuts down completely.

Specifications

LAN

Ethernet: 1 x 10/100 Mbps, RJ45
Protection: 1.5 KV magnetic isolation
Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP (MIB for I/O and Network), HTTP, CGI, SNTP

Serial Communication

Interface: RS-485-2w: Data+, Data-, GND
Serial Line Protection: 15 KV ESD for all signals

Serial Communication Parameters

Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 1200 to 115200 bps
Protocol: Modbus/RTU

Digital Input

Channels: 6, source/sink selectable
Sensor Type: NPN, PNP, and Dry contact
I/O Mode: DI or Event Counter (up to 900 Hz)
Dry Contact:
• Logic 0: short to GND
• Logic 1: open
Wet Contact:(For Source Type)
• Logic 0: 0 to 3 VDC
• Logic 1: 10 to 30 VDC (DI COM to DI)
Common Type: 6 points per COM
Isolation: 3K VDC or 2K Vrms
Counter/Frequency: 900 Hz, power off storage
Digital Filtering Time Interval: Software selectable
Over-voltage Protection: 36 VDC
Poweroff Counter Memory: 48 bytes
Relay Counter Saving: Yes

Relay Output

Channels: 6 Form A (N.O.) relay outputs, 5A
Contact Rating: 5 A @ 30 VDC, 5 A @ 250 VAC, 5 A @ 110 VAC
Inductance Load: 2 A
Resistance Load: 5 A
Breakdown Voltage: 500 VAC
Relay On/Off Time: 10 ms, 5 ms (Max.)
Initial Insulation Resistance: 1G min. @ 500 VDC
Expected Life: 100,000 times (Typical)
Initial Contact Resistance: 30 milli-ohms (Max.)
Pulse Output: 0.3 Hz at rated load

Power Requirements

Power Input: 24 VDC nominal, 12 to 48 VDC
Power Consumption: 282 mA typical @ 24 VDC

Physical Characteristics

Wiring: I/O cable max. 14AWG
Dimensions: 115 x 79 x 45.63 mm (4.53 x 3.11 x 1.8 in)
Weight: 225 g

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

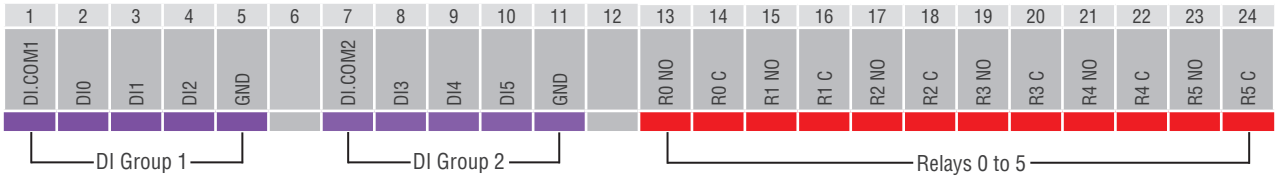
EMI: FCC Part 15, CISPR (EN55022) class A
EMS: IEC 61000-4, IEC 61000-6
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Warranty

Warranty Period: 2 years
Details: See www.moxa.com/warranty

Pin Assignment

I/O (left to right)

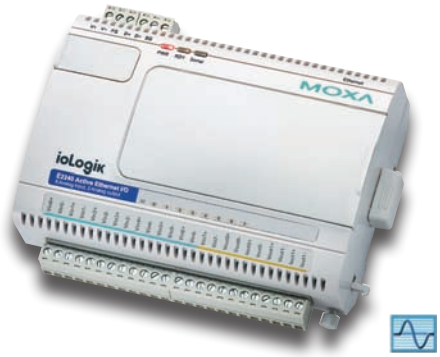


Ordering Information

ioLogik E2214: Active Ethernet I/O with 6 digital inputs and 6 relay outputs
LDP1602: LCD module with 16 x 2 text display and 5 buttons

ioLogik E2240

Active Ethernet I/O with 8 analog inputs and 2 analog outputs



- 8-channel analog inputs for voltage, current signal
- 2-channel analog outputs for voltage, current actuator control
- Instant event messaging by TCP/UDP/email/SNMP-trap
- Easy-to-use Click&Go™ Logic for local output control
- PC-based configuration utility and web console
- Windows/WinCE VB/VC.NET and Linux C APIs
- I/O control over Modbus/TCP and SNMP protocol
- NIST-traceable calibration

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

Combination of analog input and output

The ioLogik E2240 comes with a combination of analog inputs and analog outputs in one module, and supports a wide range of sensors and actuators, including pH, conductivity, pressure, flow, and valves.

Specifications

LAN

Ethernet: 1 x 10/100 Mbps, RJ45
Protection: 1.5 KV magnetic isolation
Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP (MIB for I/O and Network), HTTP, CGI, SNTP

Serial Communication

Interface: RS-485-2w: Data+, Data-, GND
Serial Line Protection: 15 KV ESD for all signals

Serial Communication Parameters

Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 1200 to 115200 bps
Protocol: Modbus/RTU

Analog Input

Channels: 8 analog inputs with differential input
Resolution: 16 bits
I/O Mode: Voltage / Current
Input Range: ±150 mV, ±500 mV, ±5 V, ±10 V, 0 to 20 mA, 4 to 20 mA
Data Format: 16-bit integer (2's complement)
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
Sampling Rate (all channels):
• 10 samples/sec for voltage
• 6 samples/sec for current
Input Impedance: 900K ohms (min.)
Built-in Resistor for Current Input: 106 ohms
CMR @ 50/60 Hz: 95 dB min.
Zero Drift: ±9 μV/°C
Span Drift: ±25 ppm/°C
Isolation: 3K VDC or 2K Vrms

Analog Output

Channels: 2
Resolution: 12 bits
Output Range: 0 to 10 V, 4 to 20 mA
Drive Voltage: 15 VDC for current output
Accuracy:
±0.1% FSR @ 25°C,
±0.3% FSR @ -10 and 60°C
Zero Drift: ±9 μV/°C
Span Drift: ±25 ppm/°C
Load Resistor: Less than 250 ohms

Power Requirements

Power Input: 24 VDC nominal, 12 to 48 VDC
Power Consumption: 282 mA typical @ 24 VDC

Physical Characteristics

Wiring: I/O cable max. 14AWG
Dimensions: 115 x 79 x 45.63 mm (4.53 x 3.11 x 1.8 in)
Weight: 210 g

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

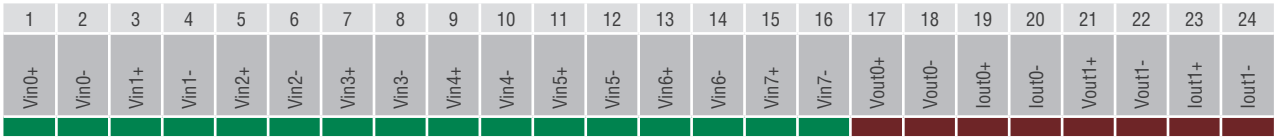
EMI: FCC Part 15, CISPR (EN55022) class A
EMS: IEC 61000-4, IEC 61000-6
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Warranty

Warranty Period: 2 years
Details: See www.moxa.com/warranty

Pin Assignment

I/O (left to right)

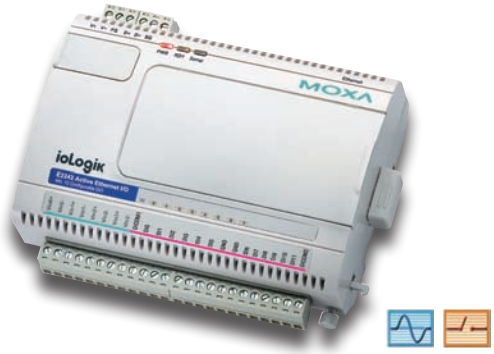


Ordering Information

ioLogik E2240: Active Ethernet I/O with 8 analog inputs and 2 analog outputs
LDP1602: LCD module with 16 x 2 text display and 5 buttons

ioLogik E2242

Active Ethernet I/O with 4 analog inputs and 12 configurable DIOs



- 4 fixed differential analog input channels
- 12 configurable digital input/output channels
- DI counter saved automatically when power shuts off
- Instant event messaging by TCP/UDP/email/SNMP-Trap
- PC-based configuration utility and web console
- Easy-to-use Click&Go™ Logic for local output control
- Windows/WinCE VB/VC.NET and Linux C APIs
- I/O control over Modbus/TCP and SNMP protocol
- NIST traceable calibration

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

Better I/O Matrix for Monitoring—Moxa's ioLogik E2242 is tailormade for use with remote monitoring and alarm systems. This Active Ethernet I/O product provides 4 analog inputs and 12 configurable DIOs for a 1:3 ratio of analog IOs to digital IOs perfectly adapted to water tank monitoring and environmental monitoring applications, in which 1 analog input is used to trigger 3 digital outputs as High-High, High, and Low alarms. Moxa's ioLogik E2242 lets you set up your monitoring system without the need for a local PC or RTU.

Specifications

LAN

Ethernet: 1 x 10/100 Mbps, RJ45

Protection: 1.5 KV magnetic isolation

Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP (MIB for I/O and Network), HTTP, CGI, SNTP

Serial Communication

Interface: RS-485-2w: Data+, Data-, GND

Serial Line Protection: 15 KV ESD for all signals

Serial Communication Parameters

Parity: None

Data Bits: 8

Stop Bits: 1

Flow Control: None

Baudrate: 1200 to 115200 bps

Protocol: Modbus/RTU

Analog Input

Channels: 4 analog inputs with differential input

Resolution: 16 bits

I/O Mode: Voltage / Current

Input Range: ±150 mV, 0 to 150 mV, ±500 V, 0 to 500 mV, ±5 V, 0 to 5 V, ±10 V, 0 to 10 V, 0 to 20 mA, 4 to 20 mA

Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C

Sampling Rate (all channels): 100 samples/sec

Input Impedance: 200K ohms (min.)

Built-in Resistor for Current Input: 102 ohms

DI/DO Configurable Channels

Channels: 12

I/O Mode:
• DI or Event Counter (up to 900 Hz)
• DO or Pulse Output (up to 100 Hz)

Digital Input

Channels: Up to 12, source/sink selectable

Sensor Type: NPN, PNP, and Dry contact

I/O Mode: DI or event counter (up to 900 Hz)

Dry Contact:
• Logic 0: short to GND; • Logic 1: Open

Wet Contact: (For Source Type)
• Logic 0: 0 to 3 VDC; • Logic 1: 10 to 30 VDC

Common Type: 6 points per COM

Isolation: 3K VDC or 2K Vrms

Counter/Frequency: 900 Hz, power off storage

Digital Filtering Time Interval: Software selectable

Over-voltage Protection: 36 VDC

Poweroff Counter Memory: 48 bytes

Digital Output

Channels: Up to 12, sink type, 36 VDC, 200 mA

I/O Mode: DO or Pulse Output (up to 100 Hz)

Pulse Wave Width/Frequency: 10 ms/100 Hz

Over-voltage Protection: 45 VDC

Over-current Limit: 400 mA (typical)

Over-temperature Shutdown: 175°C (min.)

Output Current Rating: Max. 200 mA per channel

Isolation: 2K Vrms or 3K VDC (Magnetic)

Power Requirements

Power Input: 24 VDC nominal, 12 to 48 VDC

Power Consumption: 282 mA typical @ 24 VDC

Physical Characteristics

Wiring: I/O cable max. 14AWG

Dimensions: 115 x 79 x 45.63 mm (4.53 x 3.11 x 1.8 in)

Weight: 215 g

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

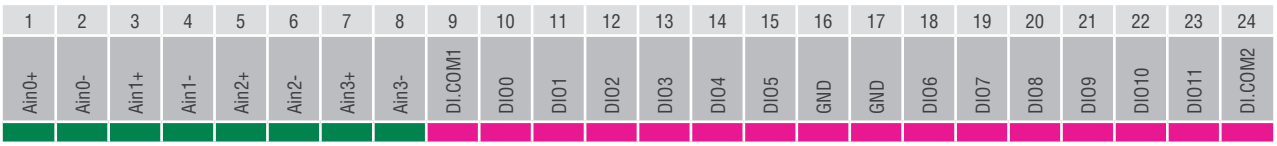
EMI: FCC Part 15, CISPR (EN55022) class A
EMS: IEC 61000-4, IEC 61000-6
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Warranty

Warranty Period: 2 years
Details: See www.moxa.com/warranty

Pin Assignment

I/O (left to right)



Ordering Information

ioLogik E2242: Active Ethernet I/O with 4 analog inputs and 12 configurable DIOs
LDP1602: LCD module with 16 x 2 text display and 5 buttons

ioLogik E2260

Active Ethernet I/O with 6 RTD inputs and 4 digital outputs

- Supports PT, JPT, Ni RTD sensor types and resistors
- Adjustable RTD sampling rate
- Instant event messaging by TCP/UDP/email/SNMP-trap
- PC-based configuration utility and web console
- Easy-to-use Click&Go™ Logic for local output control
- Windows/WinCE VB/VC.NET and Linux C APIs
- I/O control over Modbus/TCP and SNMP protocol
- NIST traceable calibration

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

Bring Intelligence to Temperature Measurement

The ioLogik E2260 brings intelligence to temperature sensors. It comes equipped with virtual channels that are designed to calculate the average value of each channel and the difference between two channels. And it does all this without a controller or PC.

Compatible with Popular RTD Temperature Sensors

The ioLogik E2260 offers PT100, PT1000, JPT, and Ni sensor types and a resistor of up to 2.2 kilo-ohms, and supports using your own resistance sensor, such as PTC or NTC types for your HVAC applications.

Specifications

LAN

Ethernet: 1 x 10/100 Mbps, RJ45
Protection: 1.5 KV magnetic isolation
Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP (MIB for I/O and Network), HTTP, CGI, SNTP

Serial Communication

Interface: RS-485-2w: Data+, Data-, GND
Serial Line Protection: 15 KV ESD for all signals

Serial Communication Parameters

Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 1200 to 115200 bps
Protocol: Modbus/RTU

RTD

Channels: 6
Input Type: Pt, JPt, Ni, RTD sensor, resistor
Sampling Rate: 12 samples/sec (all channels)
Resolution: 0.1°C or 0.1 ohm
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
Input Impedance: 625K ohms (min.)

Digital Output

Channels: 4, sink, 36 VDC, 200 mA
I/O Mode: DO or Pulse Output
Pulse Wave Width/Frequency: 10 ms/100 Hz
Over-voltage Protection: 45 VDC
Over-current Limit: 750 mA
Over-temperature Shutdown: 175°C
Isolation: 3K VDC or 2K Vrms

Power Requirements

Power Input: 24 VDC nominal, 12 to 48 VDC
Power Consumption: 282 mA typical @ 24 VDC

Physical Characteristics

Wiring: I/O cable max. 14AWG
Dimensions: 115 x 79 x 45.63 mm (4.53 x 3.11 x 1.8 in)
Weight: 215 g

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

EMI: FCC Part 15, CISPR (EN55022) class A
EMS: IEC 61000-4, IEC 61000-6
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Warranty

Warranty Period: 2 years
Details: See www.moxa.com/warranty

Pin Assignment

I/O (left to right)

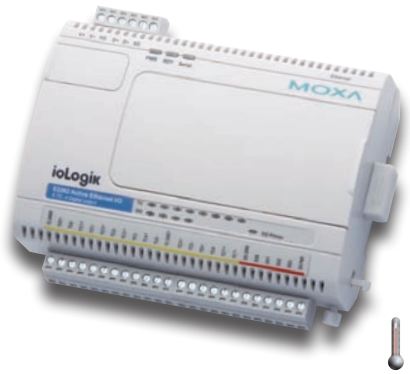
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
EX0	IN0+	IN0-	EX1	IN1+	IN1-	EX2	IN2+	IN2-	EX3	IN3+	IN3-	EX4	IN4+	IN4-	EX5	IN5+	IN5-	DO.GND	DO0	DO1	DO2	DO3	DO.PWR

Ordering Information

ioLogik E2260: Active Ethernet I/O with 6 RTD inputs and 4 digital outputs
LDP1602: LCD module with 16 x 2 text display and 5 buttons

ioLogik E2262

Active Ethernet I/O with 8 thermocouple inputs and 4 digital outputs



- Supports J, K, T, E, R, S, B, and N type thermocouple and mV modes
- Conversion Time: Less than 90 ms
- Instant event messaging by TCP/UDP/email/SNMP-Trap
- PC-based configuration utility and web console
- Easy-to-use Click&Go™ Logic for local output control
- Windows/WinCE VB/VC.NET and Linux C APIs
- I/O control over Modbus/TCP and SNMP protocol
- NIST traceable calibration

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

Extend the Wiring Length

The ioLogik E2262 can extend the wiring length of your sensors up to 10 fold. For example, whereas the wiring for a J-Type may normally extend only 10 m, the ioLogik E2262 can be used to increase the J-Type TC wiring length up to 100 m.

More Accurate Temperates

The ioLogik E2262 has two cold junction compensation sets and supports digital filtering. Calibration, linearization, and calculation are based on the devices traced by the NIST (National Institute of Standards and Technology), and are stored in memory to eliminate this source of error. The ioLogik E2262 can also detect burnout and disconnection.

Specifications

LAN

Ethernet: 1 x 10/100 Mbps, RJ45
Protection: 1.5 KV magnetic isolation
Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP (MIB for I/O and Network), HTTP, CGI, SNTP

Serial Communication

Interface: RS-485-2w: Data+, Data-, GND
Serial Line Protection: 15 KV ESD for all signals

Serial Communication Parameters

Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 1200 to 115200 bps
Protocol: Modbus/RTU

Thermocouple Input

Channels: 8
Sensor Type: J, K, T, E, R, S, B, N type TC and mV mode
Conversion Time: Less than 90 ms
Effective Resolution: 16 bits
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
Input Impedance: 1 M ohm or better

Digital Output

Channels: 4, sink type, 36 VDC, 200 mA
I/O Mode: DO or Pulse Output (up to 100 Hz)
Pulse Wave Width/Frequency: 10 ms/100 Hz
Over-voltage Protection: 45 VDC
Over-current Limit: 750 mA
Over-temperature Shutdown: 175°C
Isolation: 3K VDC or 2K Vrms

Power Requirements

Power Input: 24 VDC nominal, 12 to 48 VDC
Power Consumption: 282 mA typical @ 24 VDC

Physical Characteristics

Wiring: I/O cable max. 14AWG
Dimensions: 115 x 79 x 45.63 mm (4.53 x 3.11 x 1.8 in)
Weight: 210 g

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

EMI: FCC Part 15, CISPR (EN55022) class A
EMS: IEC 61000-4, IEC 61000-6
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Warranty

Warranty Period: 2 years
Details: See www.moxa.com/warranty

I/O Pin Assignment

I/O (left to right)

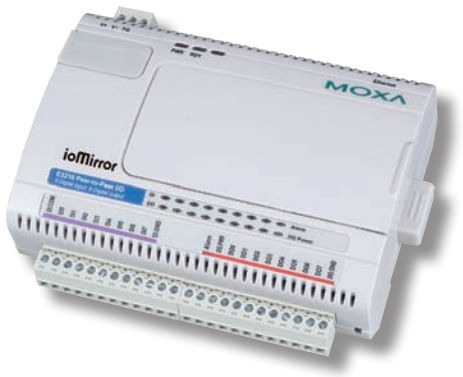
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
TC0 +	TC0 -	TC1 +	TC1 -	TC2 +	TC2 -	TC3 +	TC3 -	TC4 +	TC4 -	TC5 +	TC5 -	TC6 +	TC6 -	TC7 +	TC7 -		DO.GND	DO.GND	DO0	DO1	DO2	DO3	DO.PWR

Ordering Information

ioLogik E2262: Active Ethernet I/O with 8 thermocouple inputs and 4 digital outputs
LDP1602: LCD module with 16 x 2 text and 5 buttons

ioMirror E3210

Ethernet Peer-to-Peer I/O with 8 digital inputs and 8 digital outputs



- Direct input-to-output signal communication over IP
- High speed Peer-to-Peer I/O within 20 ms
- One physical alarm port for connectivity status
- Quick and easy utility and web-based settings
- Local alarm channel
- Remote alarm message
- Supports Modbus/TCP for remote monitoring
- Optional LCD module for simple setting

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

Direct Input-to-Output Communication over IP

ioMirror E3000 Ethernet I/O products are designed as a cable-replacement solution that connects remote digital input signals to output signals over an IP network. The ioMirror E3210 provides 8 digital input channels, 8 digital output channels, and a 10/100M Ethernet interface. Up to 8 pairs of digital input and output signals can be exchanged over Ethernet with another ioMirror E3210, or can be sent to a local PLC or DCS controller. Over a local area network, the ioMirror can achieve a low signal latency (typically less than 20 ms). With ioMirror, remote sensors can now be connected to local controllers or display panels over copper, fiber, or wireless Ethernet infrastructures. Signals can be transmitted over virtually unlimited distances, without noise problems.

Split Sensor Signals to 16 Different Locations

The ioMirror E3000 can split one input signal to two digital output channels at two different IP addresses. Eight tank level signals can be monitored at 16 different display panels, all at the same time.

Local Alarm and Remote Alarm Messages for Monitoring Connectivity

The ioMirror E3210 has a 24 VDC alarm output channel that can activate an attached buzzer or LED display when the connection fails. In addition, both ioMirror modules can send messages to the ioEventLog software, ensuring that at least one of the warning messages will reach the ioEventLog software.

Specifications

LAN

Ethernet: 1 x 10/100 Mbps, RJ45
Protection: 1.5 KV magnetic isolation
Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, HTTP, SNTP

Digital Input

Channels: 8, source type
Sensor Type: NPN, Dry contact
I/O Mode: Digital Input
Dry Contact:
• Logic 0: short to GND
• Logic 1: open
Wet Contact:
• Logic 0: 0 to 3 VDC
• Logic 1: 10 to 30 VDC (DI COM to DI)
Common Type: 8 points per COM
Isolation: 3K VDC or 2K Vrms
Digital Filtering Time Interval: Software selectable
Over-voltage Protection: 36 VDC

Digital Output

Channels: 8, sink type, 36 VDC, 200 mA
I/O Mode: Digital Output
Over-voltage Protection: 45 VDC
Over-current Limit: 600 mA
Over-temperature Shutdown: 160°C
Output Current Rating: Max. 200 mA per channel
Isolation: 3K VDC or 2K Vrms

Alarm Port Output

Channels: 1, sink type
Output Current Rating: Max. 200 mA per channel
Isolation: 3K VDC or 2K Vrms

Power Requirements

Power Input: 24 VDC nominal, 12 to 48 VDC
DO Power: 24 VDC nominal, up to 45 VDC

Physical Characteristics

Wiring: I/O cable max. 14 AWG
Dimensions: 115 x 79 x 45.63 mm (4.53 x 3.11 x 1.8 in)
Weight: 205 g

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

EMI: FCC Part 15, CISPR (EN55022) class A
EMS: IEC 61000-4, IEC 61000-6
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Warranty

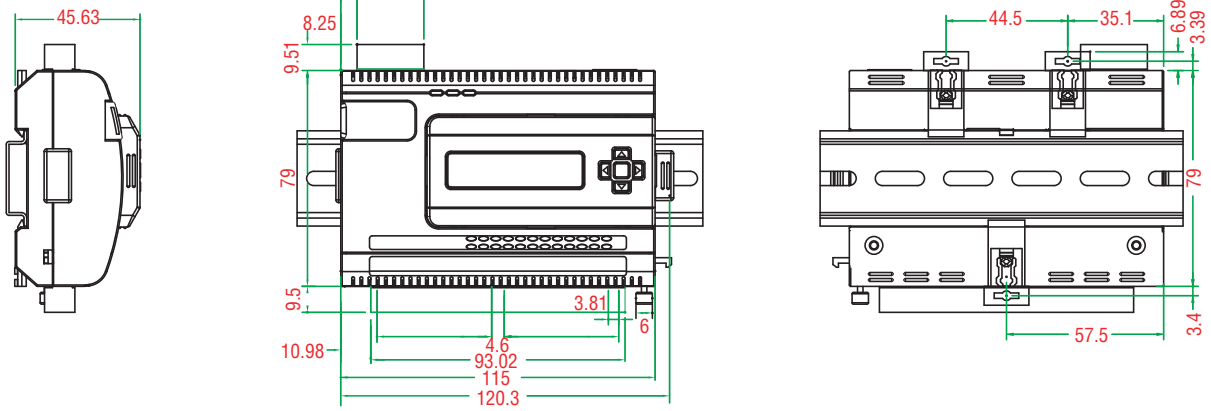
Warranty Period: 2 years
Details: See www.moxa.com/warranty

I/O Pin Assignment

I/O (left to right)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
DI.COM	DI0	DI1	DI2	DI3	DI4	DI5	DI6	DI7	DI.GND				Alarm	DO.PWR	DO0	DO1	DO2	DO3	DO4	DO5	DO6	DO7	DO.GND

Dimensions (unit = mm)



Side View | Front View | Rear View

Ordering Information

ioMirror E3210: Ethernet Peer-to-Peer I/O with 8 digital inputs and 8 digital outputs
LDP1602: LCD module with 16 x 2 text display and 5 buttons

ioLogik E4200

Modular Active Ethernet I/O adaptor

- Supports up to 16 I/O modules
- Dual Ethernet LANs and one RS-232 port
- Front-end intelligence that supports 80 Click&Go rules
- Unicode Active Messaging with real-time stamp, including SMS, SNMP Trap with I/O status, TCP, email
- Built-in web console
- PC utility: Auto detection of installed modules
- Windows/WinCE VB/VC.NET and Linux C APIs

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The ioLogik E4200 is suitable for remote monitoring and alarm systems, such as are used for water treatment systems, water supply systems, wastewater treatment systems, and power monitoring systems. These kinds of applications need more I/O points and a variety of I/O types, including temperature sensors, gas detectors, and water quality detectors, all of which can benefit from the versatile mixture of I/O features supported by the ioLogik E4200.

Specifications

LAN

Ethernet: 2 x 10/100 Mbps (2 MACs, 2 IPs, RJ45 connectors)

Protection: 1.5 KV magnetic isolation

Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP, SNMP Trap, HTTP, SNTP

Serial Communication

Interface: 1 x RS-232/485 (9-pin D-Sub, male)

Parameters: N, 8, 1

Baudrate: 115,200 bps

Power Requirements

Power Input: 24 VDC nominal, 12 to 36 VDC

Power Consumption: 60 mA typical @ 24 VDC

Current for I/O Modules: Max. 1.5A @ 5 VDC

Field Power

Rated Voltage: 11 to 28.8 VDC, 24 VDC typical

Current in Field Power Contact: Max. 10 A

Isolation

System Power to I/O Driver: Optical isolation

Physical Characteristics

Dimensions: 45 x 99 x 70 mm (1.65 x 3.9 x 2.75 in)

Weight: 180 g

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

EMI: FCC part 15, CISPR (EN55022) Class A

EMS:
IEC 61000-4-2 (ESD), level 2/3
IEC 61000-4-3 (RS), level 2
IEC 61000-4-4 (EFT), level 2
IEC 61000-4-5 (Surge), level 3
IEC 61000-4-6 (CS), level 2
IEC 61000-4-8 (PM), level 1
IEC 61000-4-11 (DIP)
IEC 61000-6-2 (ESD), level 2/3
IEC 61000-6-4 (EFT), level 2

Safety: UL 508

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

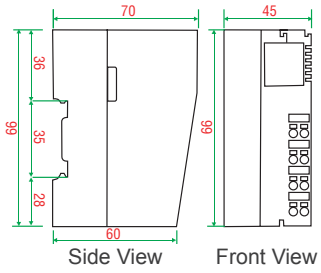
Warranty

Warranty Period: 2 years

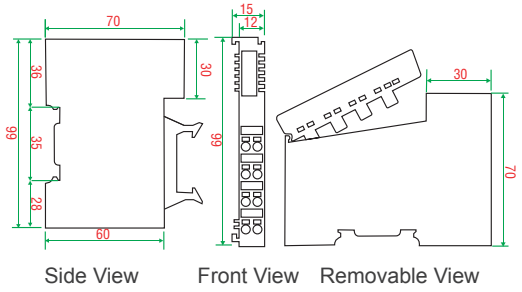
Details: See www.moxa.com/warranty

Dimensions (unit = mm)

I/O Network Adaptor



I/O Module



Step 1: Select a network adaptor module

ioLogik E4200

Step 2: Select I/O modules

M-1000/2000/3000/4000/6000 Series

Step 3: Select power modules

Power Modules M-7001/7002/7804/7805

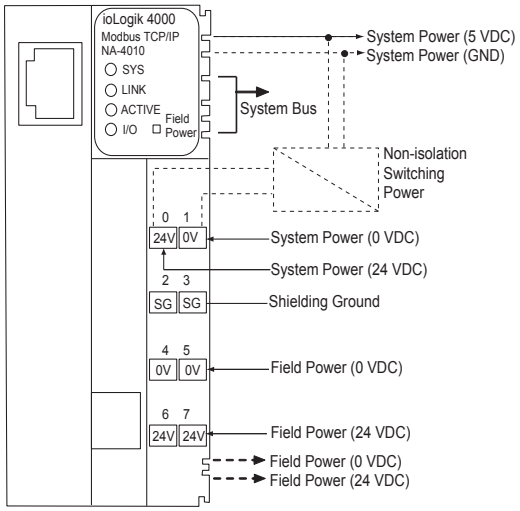
Available Models

ioLogik E4200: Active Ethernet network adaptor

Note: The ioLogik E4200 Active Ethernet network adaptor can be expanded by adding up to 16 I/O modules. See pages 5-33 to 5-41 to select the M-series modules for your application.

NA-4010

Ethernet network adaptor



The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Specifications

LAN

Ethernet: 1 x 10/100 Mbps, RJ45

Software Features

Protocols: Modbus/TCP, HTTP, Bootp

IP Settings: ARP, Bootp, static IP

Utility: ioAdmin

Programming Library: MXIO DLL library for Windows supporting Visual Basic, Visual C++, Borland C++ Builder, .NET

Number of I/O Modules Supported: Max. of 32

Power Requirements

Power Input: 11 to 28.8 VDC, 24 VDC typical

Power Consumption: 60 mA typical @ 24 VDC

Current for I/O Modules: Max. 1.5A @ 5 VDC

Field Power

Rated Voltage: 11 to 28.8 VDC, 24 VDC typical

Current in Field Power Contact: Max. 10 A

Isolation

System Power to I/O Driver: Optical isolation

Physical Characteristics

Dimensions: 45 x 99 x 70 mm (1.65 x 3.9 x 2.75 in)

Weight: 150 g

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508

EMC: CE IEC 61000-6-2, IEC 61000-6-4

Vibration: IEC-68-2-6 (2 g's during operation)

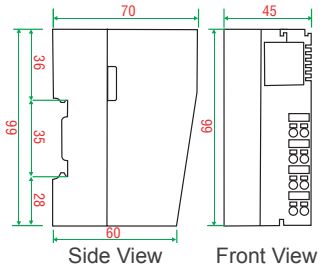
Warranty

Warranty Period: 2 years

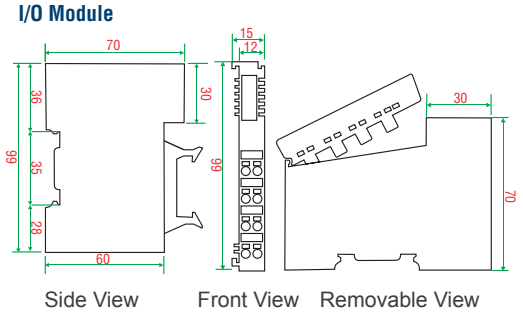
Details: See www.moxa.com/warranty

Dimensions (unit = mm)

I/O Network Adaptor



I/O Module



Ordering Information

Step 1: Select a network adaptor module

NA-4000 series

Step 2: Select I/O modules

M-1000/2000/3000/4000/6000 series

Step 3: Select power modules (optional)

M-7000 series

Available Models

NA-4010: Ethernet network adaptor (Modbus/TCP)

Note: The NA-4010 Ethernet network adaptor can be expanded by adding up to 32 I/O modules. See pages 5-33 to 5-41 to select the M- series modules for your application.

LDP1602 LCD Module

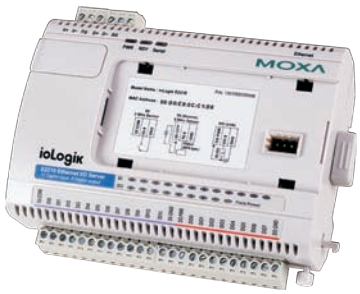
Snap-on module for the ioLogik 2000 and ioMirror 3000 series

- Hot-pluggable display module for ioLogik Active Ethernet I/O, serial I/O, and Peer-to-Peer I/O
- Easy, portable configuration kit for IP display and configuration
- Direct display for analog value and digital input, counter status
- No battery required (powered through the I/O)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Installing the LCD Module

1. Remove the ioLogik's top cover.



2. Plug in the LCD module.

3. Check and configure the IP address.

4. Check IP and I/O status.

Specifications

LCD Screen: 16 x 2 text display (in English)
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 70°C (-4 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Ordering Information

LDP1602: LCD module with 16 x 2 text display and 5 buttons

ioLogik W5340

Active GPRS I/O with 4 AIs, 8 DIOs, and 2 relay outputs

- GPRS, Ethernet LAN, RS-232/422/485 supported
- Smart Active GPRS connection
- Low power consumption
- Secure wake on call ID
- Active messaging with real-time stamp
- Data logging with SD card
- Unicode Active Messaging with real-time stamp, including SMS, SNMP Trap with I/O status, TCP, email
- ioAdmin and Active OPC Server supported
- Windows/WinCE VB/VC.NET and Linux C APIs

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The ioLogik W5340 is designed for cellular remote monitoring and alarm systems, such as automated river monitoring and pipeline monitoring. The ioLogik W5000 series uses GPRS technology to maximize the coverage of remote monitoring applications. This kind of application needs cellular communications and I/O points connected to various sensors, including rainfall meters, flow meters, and water level detectors, since installing devices is usually difficult. They all enjoy the benefit of the GPRS communication feature of ioLogik W5340.

Specifications

Cellular

Interface: GPRS
Band Options: Quad-band 850/900/1800/1900 MHz
GPRS Multi-Slot Class: Class 10
GPRS Terminal Device Class: Class B
SMS: Point-to-Point Text/PDU
SIM Control Voltage: 3 V

LAN

Ethernet: 1 x 10/100 Mbps, RJ45
Protection: 1.5 KV magnetic isolation
Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP, SNTP

Serial Communication

Interface: 1 x RS-232/422/485, software selectable
(9-pin D-Sub, male or 5-contact terminal block)
Baudrate: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps

Analog Input

Channels: 4 analog inputs with differential input
Resolution: 16 bits
I/O Mode: Voltage / Current
Input Range: 0 to 10 V, ±10 V, ±5 V, 0 to 20 mA, 4 to 20 mA
Accuracy:
• ±0.1% FSR @ 25°C
• ±0.3% FSR @ -10 and 55°C
Sampling Rate (all channels): 100 samples/sec
Input Impedance: 200K ohms (min.)
Built-in Resistor for Current Input: 102 ohms

DI/DO Configurable Channels

Channels: 8
I/O Mode:
• DI or Event Counter (up to 900 Hz)
• DO or Pulse Output (up to 100 Hz)

Digital Input

Channels: Up to 8, source/sink selectable
Sensor Type: NPN/PNP type
I/O Mode: DI or Event Counter (up to 900 Hz)
Dry Contact:
• Logic 0: short to GND
• Logic 1: open
Wet Contact: (For Source Type)
• Logic 0: 0 to 3 VDC
• Logic 1: 10 to 30 VDC (DI COM to DI)
Common Type: 4 points per COM
Isolation: 3K VDC or 2K Vrms
Counter/Frequency: 900 Hz, power off storage
Digital Filtering Time Interval: Software selectable
Over-voltage Protection: 36 VDC
Poweroff Counter Memory: 48 bytes

Digital Output

Channels: Up to 8, sink type, 36 VDC, 200 mA
I/O Mode: DO or Pulse Output (up to 100 Hz)
Pulse Wave Width/Frequency: 10 ms/100 Hz
Over-voltage Protection: 45 VDC
Over-current Limit: 600 mA

Over-temperature Shutdown: 160°C
Output Current Rating: Max. 200 mA per channel
Isolation: 3K VDC or 2K Vrms

Relay Output

Channels: 2 Form A (N.O.) relay outputs, 5 A
Contact Rating: 5 A @ 30 VDC, 5 A @ 240 VAC, 5 A @ 110 VAC
Inductance Load: 2 A
Resistance Load: 5 A
Breakdown Voltage: 500 VAC
Relay On/Off Time: 10 ms, 5 ms (max.)
Initial Insulation Resistance: 1G min. @ 500 VDC
Expected Life: 100,000 times (Typical)
Initial Contact Resistance: 30 milli-ohms (max.)
Pulse Output: 20 operation times per minutes at rated load
Isolation: 3K VDC or 2K Vrms

Power Requirements

Power Input: 24 VDC nominal, 12 to 36 VDC
Power Consumption:
• GPRS Always On (Communication): 4.2 W
• GPRS Off: 2.8 W

Physical Characteristics

Dimensions: 46.8 x 135 x 105 mm (1.84 x 5.31 x 4.13 in)
Weight: 495 g

Environmental Limits

Operating Temperature: -10 to 55°C (14 to 131°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

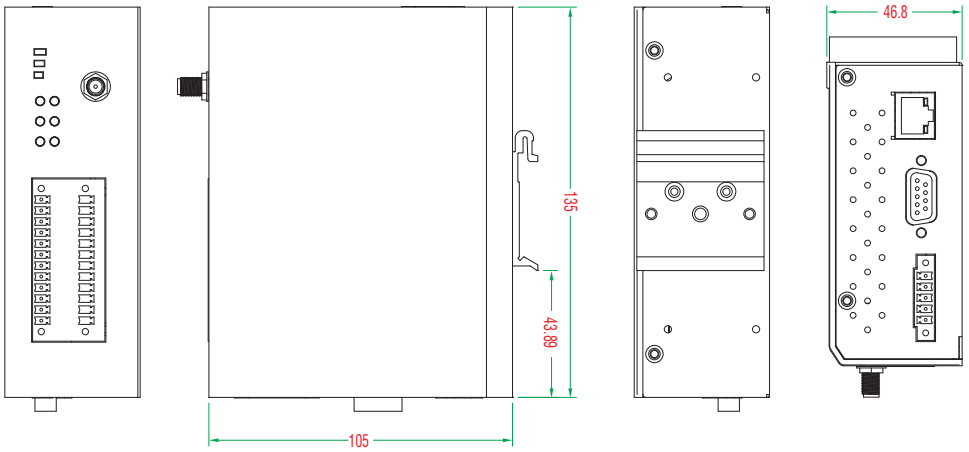
Regulatory Approvals

EMI: FCC part 15, CISPR (EN55022) Class A
EMS:
IEC 61000-4-2 (ESD), level 2/3
IEC 61000-4-3 (RS), level 2
IEC 61000-4-4 (EFT), level 2
IEC 61000-4-5 (Surge), level 3
IEC 61000-4-6 (CS), level 2
IEC 61000-4-8 (PM), level 1
IEC 61000-4-11 (DIP)
IEC 61000-6-2 (ESD), level 2/3
IEC 61000-6-4 (EFT), level 2
Safety: UL 508 (Pending)
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 2 years
Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Pin Assignment

I/O (left to right)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
AI0+	AI0-	AI1+	AI1-	DI_COM1	DIO0	DIO1	DIO2	DIO3	GND	RO_NO	R1_NO	AI2+	AI2-	AI3+	AI3-	DI_COM2	DIO4	DIO5	DIO6	DIO7	GND	RO_C	R1_C

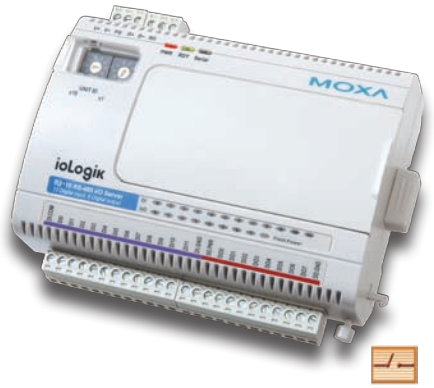
Ordering Information

Available Models

ioLogik W5340: Active GPRS I/O with 4 AIs, 8 DIOs, and 2 relay outputs

ioLogik R2110

RS-485 remote I/O with 12 digital inputs and 8 digital outputs



- 12-channel 24 VDC digital inputs with DI Event Counter mode, and software selectable filtering time
- 8-channel 24 VDC digital outputs with pulse output mode and software selectable pulse width
- LED indicators for all I/O channels
- Over-temperature protection (up to 175°C)
- Over-current protection (400-mA/channel)
- Easy-to-use, quick programming library for VB, VC++, BCB, .NET
- Firmware upgradable over RS-485

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Specifications

Serial Communication

Interface: RS-485-2w: Data+, Data-, GND
Serial Line Protection: 15 KV ESD for all signals

Serial Communication Parameters

Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 1200 to 115200 bps
Protocol: Modbus/RTU

Digital Input

Channels: 12, source type
I/O Mode: DI or Event Counter (up to 50 Hz)
Dry Contact:
Logic 0: short to GND
Logic 1: open
Wet Contact:
Logic 0: 0 to 3 VDC
Logic 1: 10 to 30 VDC
(DI COM to DI)
Common Type: 12 points per COM
Isolation: 3K VDC or 2K Vrms

Digital Output

Channels: 8, sink type, 36 VDC, 200 mA
I/O Mode: DO or Pulse Output (up to 50 Hz)
Output Current Rating: Max. 200 mA per channel
Isolation: 3K VDC or 2K Vrms
Output Frequency: 50 Hz

Power Requirements

Power Input: 24 VDC nominal, 12 to 48 VDC
Power Consumption: 282 mA typical @ 24 VDC

Physical Characteristics

Wiring: I/O cable max. 14AWG
Dimensions: 115 x 79 x 45.63 mm (4.53 x 3.11 x 1.8 in)
Weight: 200 g

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

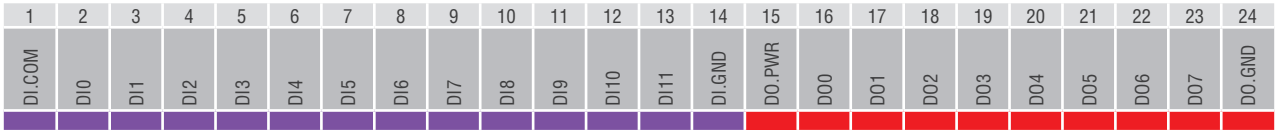
EMI: FCC Part 15, CISPR (EN55022) class A
EMS: IEC 61000-4, IEC 61000-6
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Warranty

Warranty Period: 2 years
Details: See www.moxa.com/warranty

Pin Assignment

I/O (left to right)



Ordering Information

ioLogik R2110: RS-485 remote I/O with 12 digital inputs and 8 digital outputs
LDP1602: LCD module with 16 x 2 text display and 5 buttons

ioLogik R2140

RS-485 remote I/O with 8 analog inputs and 2 analog outputs

- 8 analog input channels for millivolts (mV), voltage, and current signal with wire-off detection (at 4 to 20 mA)
- 2-channel analog outputs for voltage, current actuator control
- 16-bit resolution analog inputs, 12-bit resolution analog output
- Easy-to-use, quick programming library for VB, VC++, BCB, .NET
- NIST-Traceability calibration for analog I/O channels
- Firmware upgradable over RS-485

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Specifications

Serial Communication

Interface: RS-485-2w: Data+, Data-, GND
Serial Line Protection: 15 KV ESD for all signals

Serial Communication Parameters

Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 1200 to 115200 bps
Protocol: Modbus/RTU

Analog Input

Channels: 8, sink type, 45 VDC, 200 mA
Resolution: 16 bits
I/O Mode: Voltage / Current
Input Range: ±150 mV, ±500 mV, ±5 V, ±10 V, 0 to 20 mA, 4 to 20 mA
Data Format: 16-bit integer
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
Sampling Rate (all channels):
10 samples/sec (voltage)
6 samples/sec (current)
Built-in Resistor for Current Input: 106 ohms
CMR @ 50/60 Hz: 95 dB min.
Isolation: 3K VDC or 2K Vrms

Analog Output

Channels: 2
Resolution: 12 bits
Output Range: 0 to 10 V, 4 to 20 mA
Drive Voltage: 15 VDC for current output
Accuracy:
±0.1% FSR @ 25°C,
±0.3% FSR @ -10 and 60°C
Zero Drift: ±9 μV/°C
Span Drift: ±25 ppm/°C
Load Resistor: Less than 250 ohms

Power Requirements

Power Input: 24 VDC nominal, 12 to 48 VDC
Power Consumption: 282 mA typical @ 24 VDC

Physical Characteristics

Wiring: I/O cable max. 14AWG
Dimensions: 115 x 79 x 45.63 mm (4.53 x 3.11 x 1.8 in)
Weight: 200 g

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

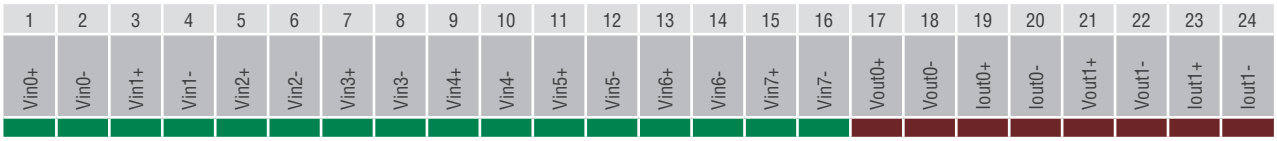
EMI: FCC Part 15, CISPR (EN55022) class A
EMS: IEC 61000-4, IEC 61000-6
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Warranty

Warranty Period: 2 years
Details: See www.moxa.com/warranty

Pin Assignment

I/O (left to right)

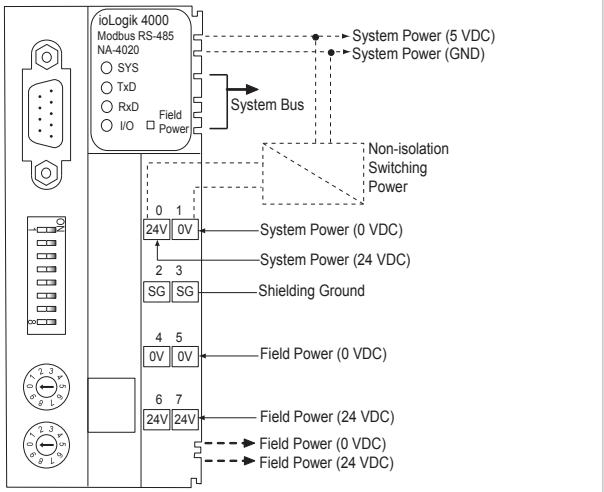


Ordering Information

ioLogik R2140: RS-485 remote I/O with 8 analog inputs and 2 analog outputs
LDP1602: LCD module with 16 x 2 text display and 5 buttons

NA-4020/4021

RS-485 or RS-232 network adaptors



The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Specifications

Serial Communication Parameters

Parity: None, Even, Odd

Data Bits: 7, 8

Stop Bits: 1, 2

Baudrate: 1200 to 115200 bps

Signals:

• NA-4020: Data+, Data-, Gnd, DIR
• NA-4021: TxD, RxD, Gnd

Software Features

Protocols: Modbus/RTU, Modbus/ASCII

Modbus Address: 00 to 99 (set by rotary switches)

Utility: ioAdmin

Programming Library: MXIO DLL library for Windows; Supports Visual Basic, Visual C++, Borland C++ Builder

Number of I/O Modules Supported: Max. of 32

Power Requirements

Power Input: 11 to 28.8 VDC, 24 VDC typical

Power Consumption: 70 mA typical @ 24 VDC

Current for I/O Modules: Max. 1.5 A @ 5 VDC

Field Power

Rated Voltage: 11 to 28.8 VDC, 24 VDC typical

Current in Field Power Contact: Max. 10 A

Isolation

System Power to I/O Driver: Optical isolation

Physical Characteristics

Dimensions: 45 x 99 x 70 mm (1.65 x 3.9 x 2.75 in)

Weight: 150 g

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508

EMC: CE IEC 61000-6-2, IEC 61000-6-4

Vibration: IEC-68-2-6 (2 g's during operation)

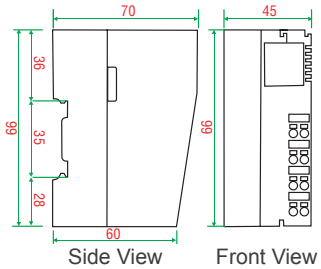
Warranty

Warranty Period: 2 years

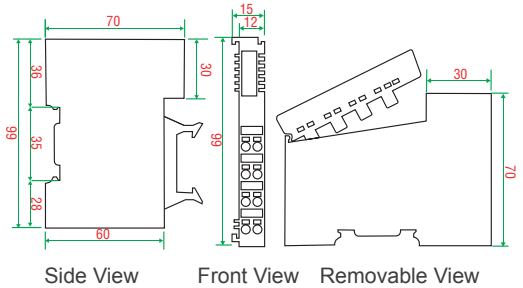
Details: See www.moxa.com/warranty

Dimensions (unit = mm)

I/O Network Adaptor



I/O Module



Ordering Information

Step 1: Select a network adaptor module

NA-4000 series

Step 2: Select I/O modules

M-1000/2000/3000/4000/6000 series

Step 3: Select power modules (optional)

M-7000 series

Available Models

NA-4020: RS-485 network adaptor (Modbus)

NA-4021: RS-232 network adaptor (Modbus)

Note: The NA-4020/4021 RS-485/232 network adaptors can be expanded by adding up to 32 I/O modules. See pages 5-33 to 5-41 to select the M- series modules for your application.

Modular Remote I/O Selection Guide

I/O Modules

DC-Digital Inputs						AC-Digital Inputs	
Specs	Model	M-1800	M-1801	M-1600	M-1601	M-1450	M-1451
	Channels	8	8	16	16	4	4
	Sink/Source	Sink	Source	Sink	Source	---	---
	Connector	RTB	RTB	20-pin	20-pin	RTB	RTB
	Voltage	24 VDC	24 VDC	24 VDC	24 VDC	110 VAC	220 VAC
	Isolation	Optical isolation					

Digital Outputs						
Specs	Model	M-2800	M-2801	M-2600	M-2601	M-2450
	Channels	8	8	16	16	4
	Sink/Source	Sink	Source	Sink	Source	Relay
	Connector	RTB	RTB	20-pin	20-pin	RTB
	Voltage	24 VDC	24 VDC	24 VDC	24 VDC	24 VDC
	Current	0.5 A	0.5 A	0.3 A	0.3A	0.5 A
	Isolation	Optical isolation				

Analog Inputs					
Specs	Model	M-3802	M-3810	M-6200	M-6201
	Channels	8	8	2	2
	Current	4 to 20 mA	---	---	---
	Voltage	---	0 to 10V	---	---
	Connector	RTB	RTB	RTB	RTB
	Resolution	12-bit	12-bit	---	---
	Isolation	Optical isolation			
	Sensor Input	---	---	RTD(ohm)	Thermo-couple (mV)

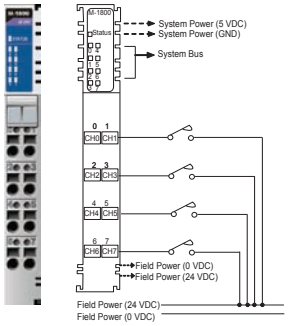
Analog Outputs			
Specs	Model	M-4402	M-4410
	Channels	4	4
	Current	4 to 20 mA	---
	Voltage	---	0 to 10 V
	Connector	RTB	RTB
	Resolution	12-bit	12-bit
	Isolation	Optical isolation	

Power Modules

Power Modules					
Specs	Model	M-7001	M-7002	M-7804	M-7805
	Channels	0	0	8	8
	Voltage	24 VDC	DC: 5, 24, 48 VDC AC: 110/220 VAC	0 VDC	24 VDC
	Purpose	System Power	Field Power	Field Power	Field Power

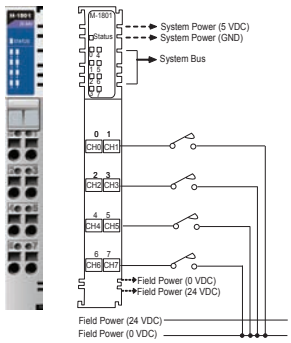
Digital Input Modules

8-channel 24 VDC digital input modules



M-1800: 8 digital inputs, sink, 24 VDC

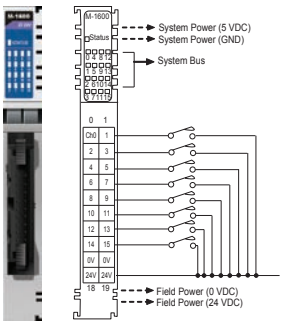
Inputs per Module: 8 channels, sink type
On-state Voltage: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
Min. Off-state Voltage: Max. 5 VDC
On-state Current: Max. 6 mA/point @ 28.8 VDC
Input Impedance: Typ. 5.1K ohms
Filtering Time: Typ. 1.5 ms
Common Type: External common
Power Consumption: Max. 35 mA @ 5 VDC



M-1801: 8 digital inputs, source, 24 VDC

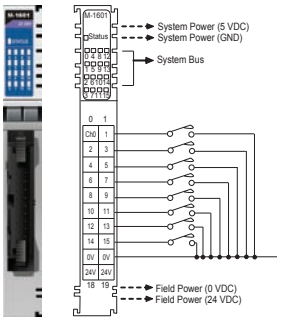
Inputs per Module: 8 channels, source type
On-state Voltage: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
Min. Off-state Voltage: Max. 5 VDC
On-state Current: Max. 6 mA/point @ 28.8 VDC
Input Impedance: Typ. 5.1K ohms
Filtering Time: Typ 1.5 ms
Common Type: External common
Power Consumption: Max. 35 mA @ 5 VDC

16-channel 24 VDC digital input modules



M-1600: 16 digital inputs, sink, 24 VDC

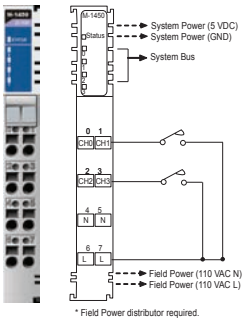
Inputs per Module: 16 channels, sink type
On-state Voltage: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
Min. Off-state Voltage: Max. 5 VDC
On-state Current: Max. 6 mA/point @ 28.8 VDC
Input Impedance: Typ. 5.1K ohms
Filtering Time: Typ. 1.5 ms
Common Type: 16 channels for 2 COMs
Power Consumption: Max. 40 mA @ 5 VDC



M-1601: 16 digital inputs, source, 24 VDC

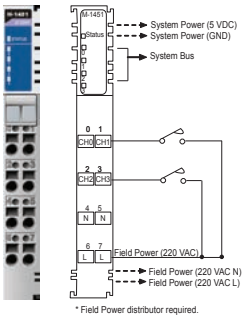
Inputs per Module: 16 channels, source type
On-state Voltage: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
Min. Off-state Voltage: Max. 5 VDC
On-state Current: Max. 6 mA/point @ 28.8 VDC
Input Impedance: Typ. 5.1K ohms
Filtering Time: Typ. 1.5 ms
Common Type: 16 channels for 2 COMs
Power Consumption: Max. 40 mA @ 5 VDC

4-channel AC digital input modules



M-1450: 4 digital inputs, 110 VAC

Inputs per Module: 4 channels
On-state Voltage: 120 VAC nominal, min. 85 VAC to max. 132 VAC
Min. Off-state Voltage: Max. 45 VAC
On-state Current: Max. 8 mA/point @ 132 VAC
Input Impedance: Typ. 11K ohms
Common Type: 4 channels for 2 COMs (single common)
Power Consumption: Max. 35 mA @ 5 VDC



M-1451: 4 digital inputs, 220 VAC

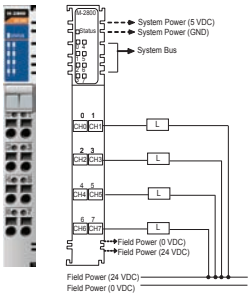
Inputs per Module: 4 channels
On-state Voltage: 240 VAC nominal, min. 170 VAC to max. 264 VAC
Min. Off-state Voltage: Max. 45 VAC
On-state Current: Max. 12 mA/point @ 264 VAC
Input Impedance: Typ. 22K ohms
Common Type: 4 channels for 2 COMs (single common)
Power Consumption: Max. 35 mA @ 5 VDC

Ordering Information

		DC-Digital Input Modules				AC-Digital Input Modules	
Specs	Model	M-1800	M-1801	M-1600	M-1601	M-1450	M-1451
	Channels	8	8	16	16	4	4
	Sink/Source	Sink	Source	Sink	Source	---	---
	Connector	RTB	RTB	20-pin	20-pin	RTB	RTB
	Voltage	24 VDC	24 VDC	24 VDC	24 VDC	110 VAC	220 VAC
	Isolation	Optical Isolation					

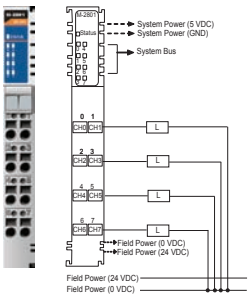
Digital Output Modules

8-channel 24 VDC digital output modules



M-2800: 8 digital outputs, sink, 24 VDC, 0.5 A

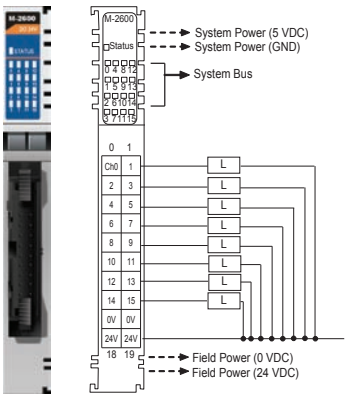
Outputs per Module: 8 channels, sink type
Output Voltage Range: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
On-state Voltage Drop: Max. 0.3 VDC @ 25°C
On-state Current: Min. 1 mA per channel
Off Leakage Current: Max. 50 μA
Output Current Rating: Max. 0.5 A per channel
Common Type: 8 channels per external common (single common)
Power Consumption: Max. 60 mA @ 5 VDC



M-2801: 8 digital outputs, source, 24 VDC, 0.5 A

Outputs per Module: 8 channels, source type
Output Voltage Range: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
On-state Voltage Drop: Max. 0.3 VDC @ 25°C
On-state Current: Min. 1 mA per channel
Off Leakage Current: Max. 50 μA
Output Current Rating: Max. 0.5 A per channel
Common Type: 8 channels per external common (single common)
Power Consumption: Max. 60 mA @ 5 VDC

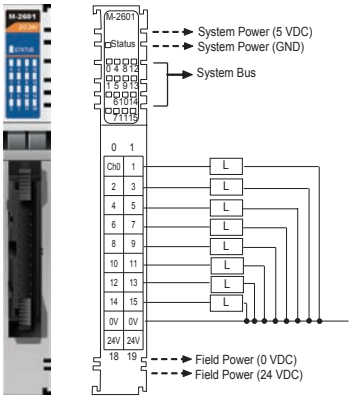
16-channel digital output modules



M-2600: 16 digital outputs, sink, 24 VDC, 0.3 A

Outputs per Module: 16 channels, sink type
Output Voltage Range: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
On-state Voltage Drop: Max. 0.3 VDC @ 25°C
On-state Current: Min. 1 mA per channel
Off Leakage Current: Max. 50 μA
Output Current Rating:
- Max. 0.3 A per channel
- Max. 4 A per common

Common Type: 16 channels for 2 COMs (single common)
Power Consumption: Max. 80 mA @ 5 VDC

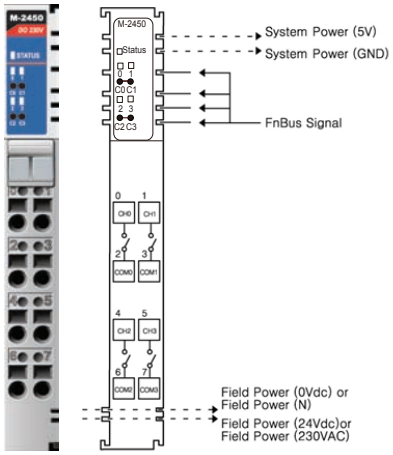


M-2601: 16 digital outputs, source, 24 VDC, 0.3 A

Outputs per Module: 16 channels, source type
Output Voltage Range: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
On-state Voltage Drop: Max. 0.3 VDC @ 25°C
On-state Current: Min. 1 mA per channel
Off Leakage Current: Max. 50 μA
Output Current Rating:
- Max. 0.3 A per channel
- Max. 4 A per common

Common Type: 16 channels for 2 COMs (single common)
Power Consumption: Max. 80 mA @ 5 VDC

4-channel relay output modules



M-2450: 4 relay outputs, 24-VDC/230-VAC, 2 A

Outputs per Module: 2 channels, relay
Relay Type:
- Form A, Normally Open (N.O.)
- Single Pole, Single Throw (SPST)

Output Voltage Range: Load dependent
- 5 to 28.8 VDC @ 2 A resistive
- 48 VDC @ 0.8 A resistive
- 110 VDC @ 0.3 A resistive
- 250 VAC @ 2 A resistive

Output Current Rating: At rated power
- 2 A @ 5 to 28.8 VDC
- 0.8 A @ 48 VDC
- 0.5 A @ 110 VDC
- 2 A @ 250 VAC

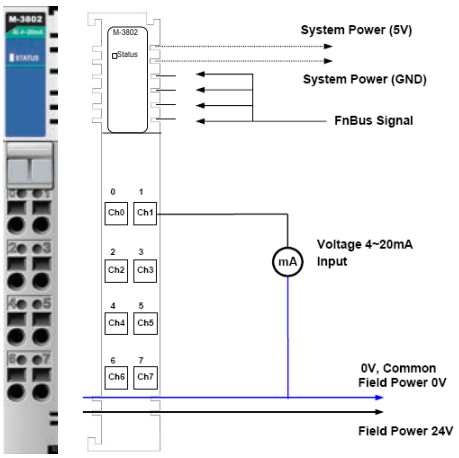
Min. Load: 100 μA, 100 m VDC per point
Max. On-state Voltage Drop: 0.5 V @ 2 A, resistive load, 24 VDC
Off-state Leakage Current: Max. 1.5 mA
Common Type: 1 channel for 1 COM
Power Consumption: Max. 65 mA @ 5 VDC

Ordering Information

Digital Output Modules						
Specs	Model	M-2800	M-2801	M-2600	M-2601	M-2450
	Channels	8	8	16	16	4
	Sink/Source	Sink	Source	Sink	Source	Relay
	Connector	RTB	RTB	20-pin	20-pin	RTB
	Voltage	24 VDC	24 VDC	24 VDC	24 VDC	230 VAC/ 24 VDC
	Current	0.5A	0.5A	0.3A	0.3A	2.0A
	Isolation	Optical isolation				
	Diagnostics	---	---	---	---	---

Analog Input Modules

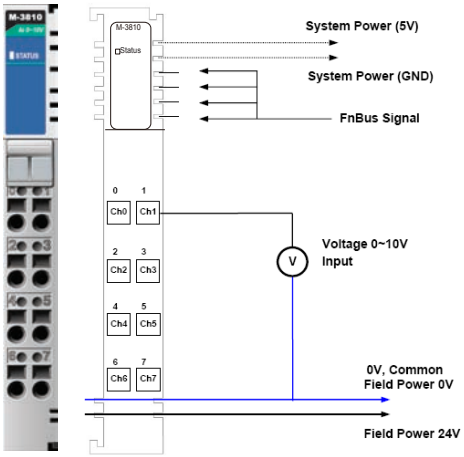
8-channel analog input modules, 12-bit resolution



M-3802: 8 analog inputs, 4 to 20 mA, 12 bits

Resolution in Ranges: 12 bits, 3.91 μA/bit
Input Current Range: 0 to 20 mA
Data Format: 16-bit integer (2's complement)
Accuracy:
- ±0.1%, FSR @ 25°C
- ±0.3%, FSR @ 0°C, 60°C

Input Impedance: 120 ohms
Conversion Time: 4 ms for all channels
Power Consumption: Max. 150 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. AWG14



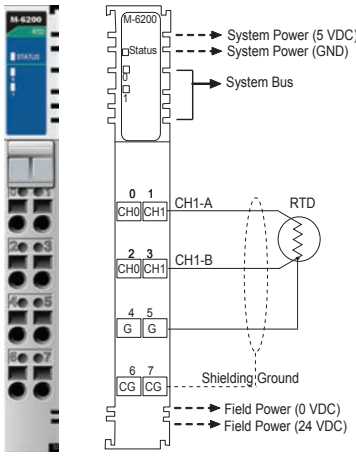
M-3810: 8 analog inputs, 0 to 10 V, 12 bits

Resolution in Ranges: 12 bits, 2.44 mV/bit
Input Current Range: 0 to 10 VDC
Data Format: 16-bit integer (2's complement)
Accuracy:
- ±0.1%, FSR @ 25°C
- ±0.3%, FSR @ 0°C, 60°C

Input Impedance: 500K ohms
Conversion Time: 4 ms for all channels
Power Consumption: Max. 150 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. AWG14

Temperature Input Modules

2-channel temperature input modules, RTD or thermocouple input



M-6200: 2 analog inputs, RTD: PT100, JPT100

Sensor Types:
- PT50, PT100, PT200, PT500, PT1000 (resistance 100 milli-ohms/bit)
- JPT100, JPT200, JPT500, JPT1000 (resistance 10 milli-ohms/bit)
- NI100, NI200, NI500, NI1000, NI120, CU10 (resistance 20 milli-ohms/bit)

Resolution: 0.1°C/10 milli-ohms

Data Format: 16-bit integer (2's complement)

Accuracy:
- ±0.1%, FSR @ 25°C
- ±0.3%, FSR @ 0°C, 60°C

Input Impedance: 500K ohms

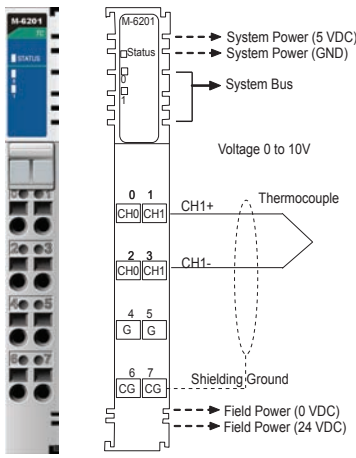
Conversion Time: 200 ms for all channels

Diagnostics: Range over (if range over, data=Dx8000)

Power Consumption: Max. 80 mA @ 5 VDC

Isolation: I/O to logic (photocoupler isolation)

Wiring: I/O cable max. AWG14



M-6201: 2 analog inputs, thermocouple

Sensor Types:
Type J/K/T/E/R/S/B/N/L/U/C/D
(mV input 10 µV/bit, 2 µV/bit)

Resolution: 0.1°C/10 µV

Data Format: 16-bit integer (2's complement)

Accuracy:
- ±0.1%, FSR @ 25°C
- ±0.3%, FSR @ 0°C, 60°C

Input Impedance: 500K ohms

Conversion Time: 200 ms for all channels

Diagnostics: Range over (if range over, data=Dx8000)

Power Consumption: Max. 80 mA @ 5 VDC

Isolation: I/O to logic (photocoupler isolation)

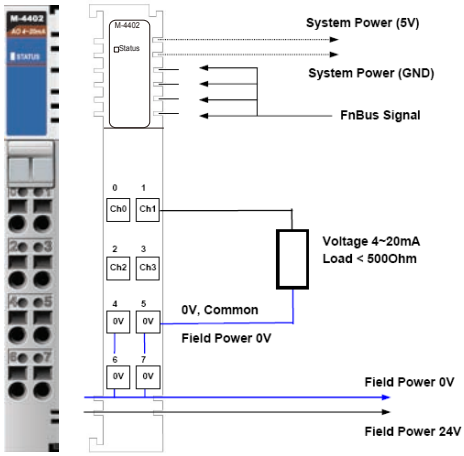
Wiring: I/O cable max. AWG14

Ordering Information

Analog Input Modules					
Specs	Model	M-3802	M-3810	M-6200	M-6201
	Channels	8	8	2	2
	Current	4 to 20 mA	---	---	---
	Voltage	–	0 to 10V	---	---
	Connector	RTB	RTB	RTB	RTB
	Resolution	12-bit	12-bit	---	---
	Isolation	Optical isolation			
	Sensor Input	---	---	RTD (ohm)	Thermo-couple (mV)

Analog Output Modules

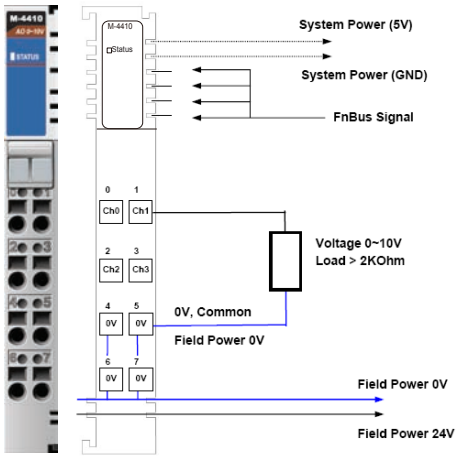
4-channel analog output modules, 12-bit resolution



M-4402: 4 analog outputs, 4 to 20 mA, 12 bits

Resolution in Ranges: 12 bits, 3.91 μA/bit
Output Current Range: 4 to 20 mA
Data Format: 16-bit integer (2's complement)
Accuracy:
- ±0.1%, FSR @ 25°C
- ±0.3%, FSR @ 0°C, 60°C

Output Impedance: Max. 500 ohms
Conversion Time: 2 ms for all channels
Power Consumption: Max. 65 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. AWG14



M-4410: 4 analog outputs, 0 to 10 V, 12 bits

Resolution in Ranges: 12 bits, 2.44 mV/bit
Output Current Range: 0 to 10 VDC
Data Format: 16-bit integer (2's complement)
Accuracy:
- ±0.1%, FSR @ 25°C
- ±0.3%, FSR @ 0°C, 60°C

Output Impedance: Max. 5K ohms
Conversion Time: 2 ms for all channels
Power Consumption: Max. 200 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. AWG14

Ordering Information

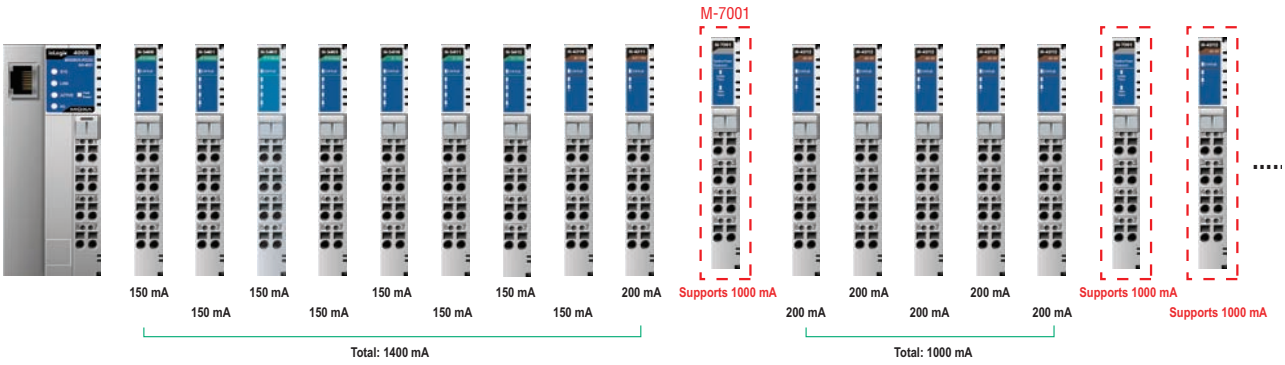
Analog Output Modules			
Specs	Model	M-4402	M-4410
	Channels	4	4
	Current	4 to 20 mA	---
	Voltage	---	0 to 10V
	Connector	RTB	RTB
	Resolution	12-bit	12-bit
	Isolation	Optical Isolation	

Power Modules

When to Use a Power Module

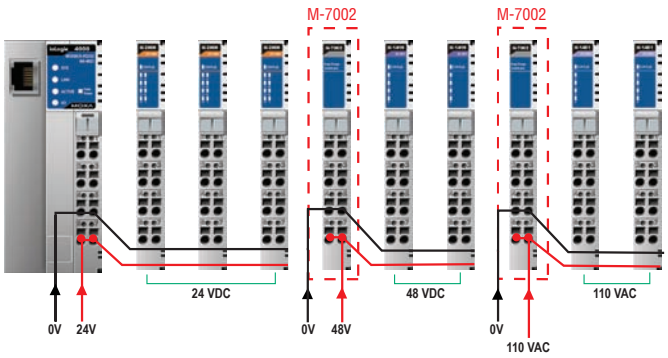
System Power Distributor

The system power expansion module is designed to provide extra power for connected I/O expansion modules. Each NA-4000 series network adaptor can provide 1.5 A @ 5 VDC. If you need more power for your installed I/O expansion modules, you will need to use an M-7001 module. However, note that the M-7001 can only provide 1.5 A @ 5 VDC.



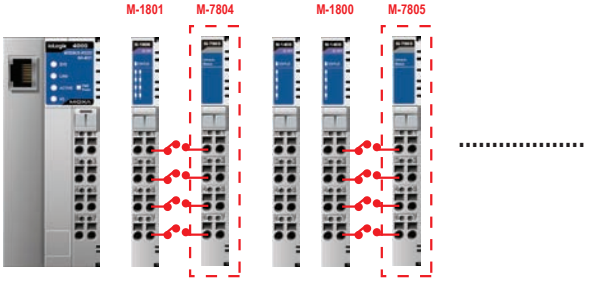
Field Power Distributor

The field power distributor is designed to isolate different field voltages. For example, before you connect a 48 VDC or 110 VAC DI/O module to a 24 VDC DI/O module, you will need an M-7002 field power distributor.



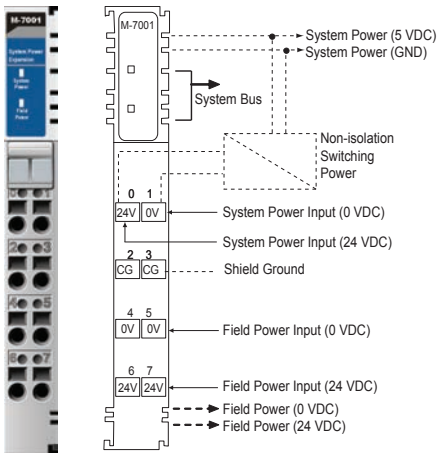
Potential Power Distributor

There are three types of potential distributor modules that provide extra wiring points, such as shielding ground, 0 V field power, and 24 V field power. For example, the 8-channel digital input (sink type) module by itself does not have a 24 V wiring point. In this case, you can add an M-7805 for easier wiring.



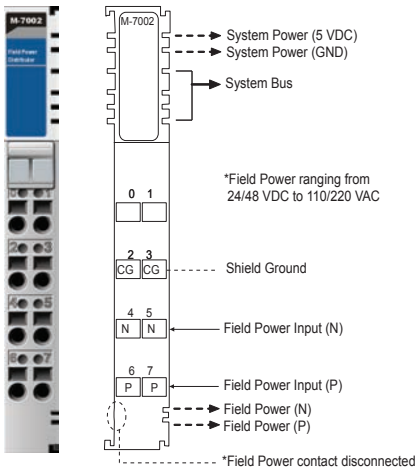
Power Modules

M-7001: System power module



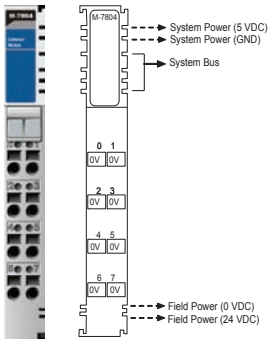
- **System Input Voltage:** 24 VDC, 11 to 28.8 VDC
- **Field Power Input Voltage:** 24 VDC (±20%)
- **Current for I/O Modules:** 1.5 A @ 5 VDC (Max.)
- **System Bus Output Voltage:** 5 VDC (Max.)
- **Field Power Contacts Current:** 10 A (Max.)

M-7002: Field power module



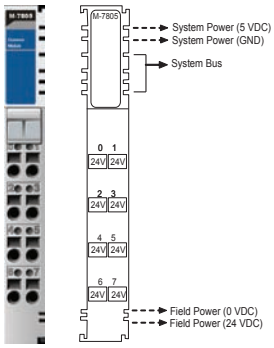
- **Field Power Input Voltage:**
  DC: 5 VDC, 24 VDC, 48 VDC
  AC: 110 VAC, 220 VAC
- **Current for Field Power Contacts:** 10 A (Max.)

M-7804: 0 VDC



Channels: 8
Mode: 0 VDC

M-7805: 24 VDC



Channels: 8
Mode: 24 VDC

Ordering Information

Power Modules					
Specs	Model	M-7001	M-7002	M-7804	M-7805
	Channels	0	0	8	8
	Voltage	24 VDC	DC: 5, 24, 48 VDC AC: 110/220 VAC	0 VDC	24 VDC
	Purpose	System Power	Field Power	Field Power	Field Power

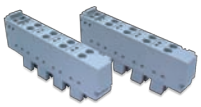
Modular I/O Accessories

TB 1600 DIN-Rail mounting screw terminal module with 20-pin connector

- 20 pins, one-to-one assignment
- Connector pitch: 3.81 mm
- DIN-Rail mounting type
- Dimensions: 77.5 x 67.5 x 51 mm (3.05 x 2.66 x 2.01 in)
- RoHS compliant

20-to-20-pin flat cable

- Connects between the TB 1600 and ioLogik 4000 series
- Length: 500 mm
- Number of Pins: 20



M-8001-PK Removable terminal block

- Terminal block for the ioLogik 4000 series
- Packaging: 9 pcs in one box

M-8003-PK Marker with 0 to 9 numbering

M-8004-PK Blank marker

- Marker for the ioLogik 4000 series
- Packaging: 100 pcs in one box

Ordering Information

- **TB 1600:** DIN-Rail mounting screw terminal module with 20-pin connector
- **20-to-20-pin flate cable:** 20-pin to 20-pin flat cable, 500 mm
- **M-8001-PK:** Removable terminal block, 9 pcs per pack
- **M-8003-PK:** Marker with 0 to 9 numbering, white color, 100 pcs
- **M-8004-PK:** Blank marker, 100 pcs

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Video Networking Solutions

Product Selection Guides

Industrial Video Networking Solutions 6-2

Video Networking Products

Introduction to Industrial Video Networking Solutions 6-3

VPort 354 Series Full motion, 4-channel MJPEG/MPEG4 industrial video encoders 6-7

VPort 254 Series Rugged 4-channel MJPEG/MPEG4 industrial video encoders 6-10

VPort 351 Series Full motion, 1-channel MJPEG/MPEG4 industrial video encoders . . .6-13

VPort 3310 Series Rugged 1-channel MPEG4 industrial video servers (encoders) 6-16

VPort 2141 Compact, 4-channel MJPEG video server (encoder) 6-18

VPort 251 Full motion, 1-channel MJPEG/MPEG4 video encoder 6-20

VPort D351 1-channel MJPEG/MPEG4 industrial video decoder 6-22

VPort 25 Series IP66, day-and-night fixed dome outdoor IP camera 6-24

SoftNVR Expandable, 64-channel IP surveillance software 6-27

SoftDVR™ Pro Easy-to-use 16-channel IP surveillance software 6-30

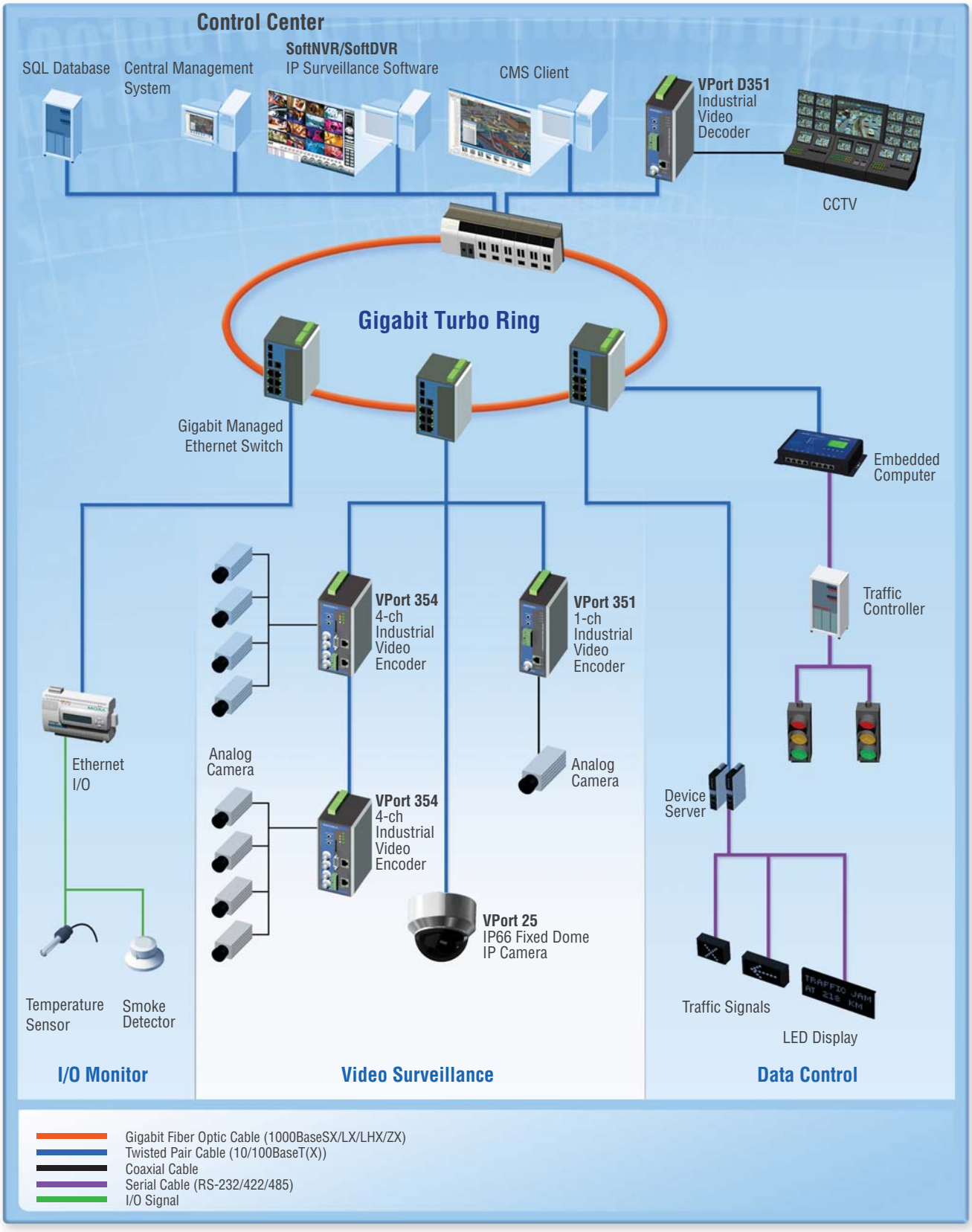
VPort SDK PLUS User-friendly software development kits 6-32

Video Networking Products

	VPort 354	VPort 254	VPort 351	VPort 3310	VPort 2141	VPort 251	VPort D351	VPort 25
Type of Product	Encoder	Encoder	Encoder	Encoder	Encoder	Encoder	Decoder	IP Camera
Form Factor								
Protection Rating	IP30	IP30	IP30	IP30	---	---	IP30	IP66
DIN-Rail Mounting	√	√	√	√	w/ optional Kit	w/ optional Kit	√	---
Panel Mounting	w/ optional Kit	w/ optional Kit	w/ optional Kit	w/ optional Kit	√	√	w/ optional Kit	---
Surface/Ceiling Mounting	---	---	---	---	---	---	---	√
Audio/Video Channels								
Video Inputs	4	4	1	1	4	1	0	0
Video Outputs	0	0	1	1	0	0	1	1
Audio Inputs	1	1	1	1	0	1	1	1
Audio Outputs	1	1	1	0	0	1	1	1
Compression Algorithm								
MJPEG	√	√	√	---	√	√	√	√
MPEG4	√	√	√	√	---	√	√	√
Video Performance								
QCIF (NTSC: 176 x 120)	30 FPS (max.)	---	---	30 FPS (max.)	30 FPS (max.)	---	---	---
QVGA (NTSC: 320 x 240)	---	30 FPS (max.)	30 FPS (max.)	---	---	30 FPS (max.)	---	30 FPS (max.)
CIF (NTSC: 352 x 240)	30 FPS (max.)	30 FPS (max.)	30 FPS (max.)	30 FPS (max.)	30 FPS (max.)	30 FPS (max.)	---	30 FPS (max.)
VGA (NTSC: 640 x 480)	---	7 FPS (max.)	30 FPS (max.)	10 FPS (max.)	---	30 FPS (max.)	---	30 FPS (max.)
2CIF (NTSC: 704 x 240)	30 FPS (max.)	---	---	---	---	---	---	---
4CIF (NTSC: 704 x 480)	30 FPS (max.)	7 FPS (max.)	30 FPS (max.)	10 FPS (max.)	30 FPS (max.)	30 FPS (max.)	---	30 FPS (max.)
Full D1 (NTSC: 720 x 480)	---	7 FPS (max.)	30 FPS (max.)	---	---	30 FPS (max.)	---	30 FPS (max.)
QCIF (PAL: 176 x 144)	25 FPS (max.)	---	---	25 FPS (max.)	25 FPS (max.)	---	---	---
QVGA (PAL: 320 x 288)	---	25 FPS (max.)	25 FPS (max.)	---	---	25 FPS (max.)	---	25 FPS (max.)
CIF (PAL: 352 x 288)	25 FPS (max.)	25 FPS (max.)	25 FPS (max.)	25 FPS (max.)	25 FPS (max.)	25 FPS (max.)	---	25 FPS (max.)
VGA (PAL: 640 x 576)	---	7 FPS (max.)	25 FPS (max.)	8 FPS (max.)	---	25 FPS (max.)	---	25 FPS (max.)
2CIF (PAL: 704 x 288)	25 FPS (max.)	---	---	---	---	---	---	---
4CIF (PAL: 704 x 576)	25 FPS (max.)	7 FPS (max.)	25 FPS (max.)	8 FPS (max.)	8 FPS (max.)	25 FPS (max.)	---	25 FPS (max.)
Full D1 (PAL: 720 x 576)	---	7 FPS (max.)	25 FPS (max.)	---	---	25 FPS (max.)	---	25 FPS (max.)
Quad View	---	---	---	---	15 FPS (max.)	---	---	---
Network Connections								
10/100BaseT(X) Ports	2	1	1	1	1	1	1	1
100BaseFX Ports	2	1	1	---	---	---	---	---
Number of COM Ports								
PTZ Ports	1	1	1	1	2	1	1	---
RS-232 Console Ports	1	1	1	---	---	1	1	---
Network Management and Control								
Web Browser	√	√	√	√	√	√	√	√
SNMP Protocols	v1/v2c/v3	v1/v2c/v3	v1/v2c/v3	v1/v2c/v3	---	v1/v2c/v3	v1/v2c/v3	v1/v2c/v3
RTSP (Real Time Streaming Protocol)	√	√	√	√	---	√	---	√
Multicast (IGMP)	v3	v3	v3	v3	---	v3	---	v3
QoS	√	√	√	---	---	√	---	√
UPnP	√	√	√	√	√	√	√	√
DDNS	√	√	√	√	√	√	√	√
PPPoE	---	---	---	√	√	---	---	---
IP Filtering	√	√	√	√	√	√	√	√
Power Requirements								
Power Redundancy	√	√	√	√	---	---	√	√
Power Inputs	2	2	2	2	1	1	2	1
Power Outputs	0	0	0	0	1	1	0	0
Power-over-Ethernet (PoE)	---	---	---	---	---	---	---	√
Alarms								
VMD (Video Motion Detection)	√	√	√	√	√	√	---	√
Digital Inputs	4	4	2	2	4	1	2	1
Relay (Digital) Outputs	2	2	2	2	4	1	2	1
Alarm Video Recording	√	---	√	---	---	---	---	---
Alarm Snapshot Image	√	√	√	√	√	√	---	√
Supported Operating Temperature Ranges								
0 to 60°C	√	√	√	√	√	√	√	---
-40 to 50°C	---	---	---	---	---	---	---	√
-40 to 75°C	√	√	√	√	---	---	---	---
Regulatory Approvals								
CE/FCC	√	√	√	√	√	√	√	√
UL508	Pending	√	√	---	---	---	√	Pending
Class 1, Div 2; ATEX Class 1, Zone 2	Pending	Pending	√	---	---	---	---	---

Introduction to Industrial Video Networking

Empower Your Video Network System with Industrial-grade Reliability



Leading the Industrial Video-over-IP Revolution

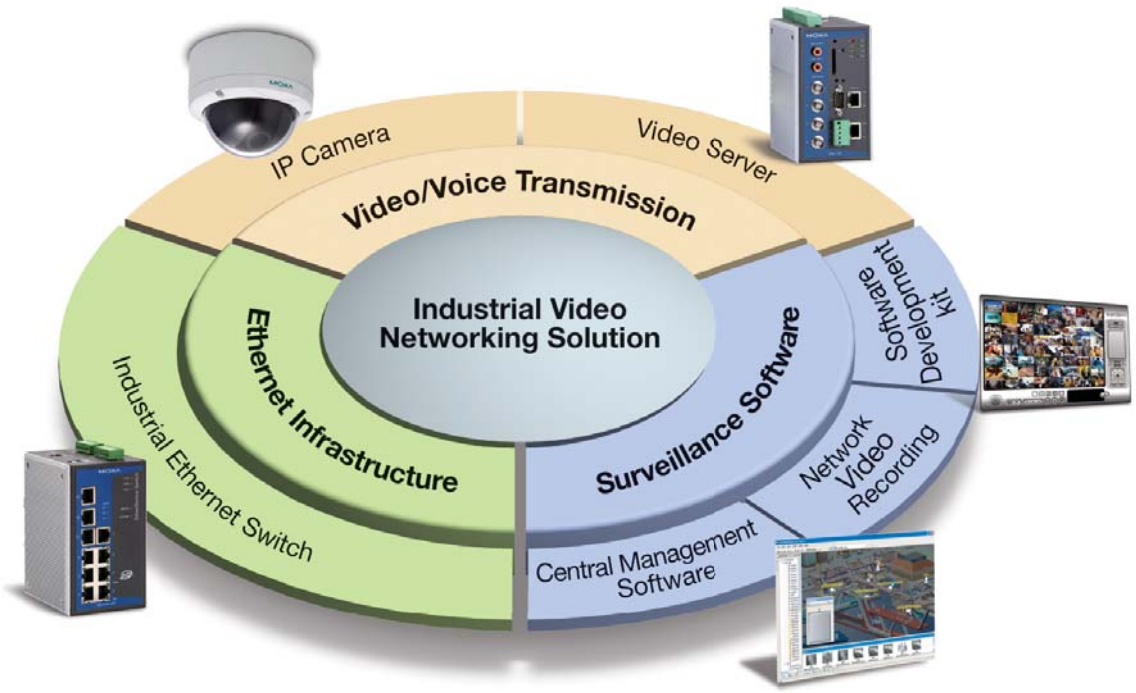
Thanks to the ever-increasing popularity of IP networks, transmitting video, voice, and data simultaneously over Ethernet networks, and even over the Internet, is now standard at locations around the world. Because of this, CCTV surveillance systems are also becoming more commonplace. Versatile and advanced video digitizing and compression technologies, such as MJPEG and MPEGx, make it possible to migrate CCTV surveillance systems to IP-based platforms. This means that video-over-IP solutions, which include IP cameras, video servers, and NVRs (Network Video Recorders), are used by some of the hottest products in the CCTV surveillance market. However, most video-over-IP solutions on the market today are designed for general purpose applications, which means they are not suitable for unpredictable industrial environments. In fact, some seemingly commonplace applications, such as road traffic control and monitoring, oil and gas refineries and pipelines, mining pits, etc., should be classified as industrial-grade, and as such require using rugged, well-designed video-over-IP solutions to ensure that the video surveillance system works properly.

To meet these stringent requirements, Moxa's new line of VPort industrial video-over-IP solutions feature an industrial-grade rugged design and extra-high reliability.

Integrated and Applicable Video Networking Solutions

Moxa's industrial video networking solutions include video servers and IP cameras that meet the requirements of a variety of application environments, such as transportation, utilities, factory monitoring, and automatic control systems. The video servers, which include video encoders and video decoders, are designed rugged to protect the hardware when it's used in demanding industrial environments. The IP camera, with vandal-proof protection and a high-quality day/night lens, is suitable for outdoor environments.

As a one-source provider, Moxa also provides a wide range of industrial Ethernet switches with redundant capability and high-performance Gigabit bandwidth for video networking infrastructures. This means that you can use Moxa's products to build a highly reliable video surveillance network for industrial automation applications.



Industrial-grade Rugged Design and Reliability

Products used in industrial environments must have a rugged design to provide better protection against adverse conditions. In general, ruggedized products should have the following characteristics:

1. Power Redundancy

A backup power supply is required since power lines used in harsh industrial environments have a greater chance of failing. This means that industrial products should have at least 2 power inputs to provide sufficient redundancy.

2. Enclosure Protection

A rugged mechanism design means having good physical protection against unexpected damage from external factors. The Ingress Protection (IP) rating index (EN60529) is an international classification system that rates the effectiveness of sealing for enclosures of electrical equipment against the intrusion of foreign objects (e.g., tools, dust, fingers) and moisture. The IP rating system can be used to determine what kind of encloser, if any, is required for the product.

3. EMI and Surge Protection

Compared to commercial-type environments, industrial environments are more likely to be subjected to severe electrical and magnetic influences. In order to protect electronic devices, higher EMI and surge protection are essential for industrial applications. And for some industrial applications, safety approvals and demanding certifications, such as UL508 and ATEX (ATmosphere EXplosible), are also required.

4. High MTBF (Mean Time Between Failures)

The MTBF value is the "mean time between failures" for a device. A higher MTBF value indicates that a device is more reliable.

5. Wide Operating Temperature Range

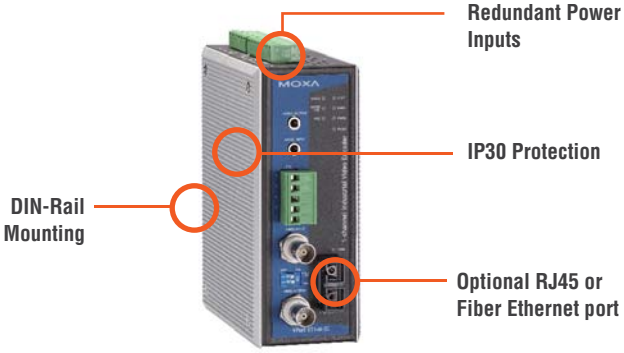
The operating temperature range is also a key issue for industrial products. In fact, some industrial applications require products that are guaranteed to operate in temperatures ranging from as low as -40°C to as high as 75°C. For these types of applications, it is important to look for products that do not use a built-in fan, since products with fans tend to have a lower MTBF.

6. DIN-Rail Mounting and Panel Mounting

A 35 mm DIN-Rail is used for many industrial applications to provide a convenient means of mounting all of the devices used for the application. For this reason, it is essential that industrial products support both DIN-Rail mounting and panel mounting.

VPort Industrial Video Servers

- 12/24 VDC or 24 VAC redundant power inputs
- DIN-Rail mounting and panel mounting accessories available
- IP30 protection enclosure
- -40 to 75°C operating temperature range for T models
- Choose either RJ45 or fiber optic Ethernet ports
- Industrial EMI/ESD protection and UL508, ATEX Class 1 Div. 2 and DNV certifications



VPort Series IP Cameras

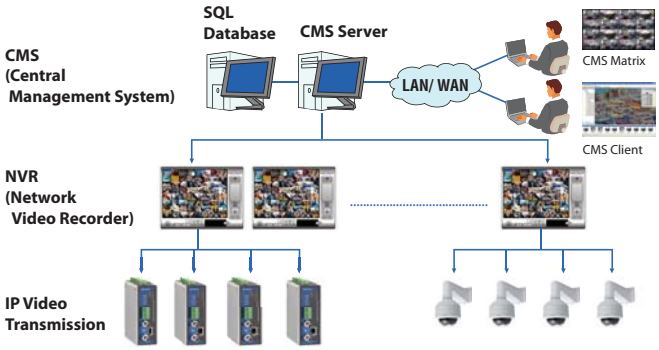
- -40 to 50°C operating temperature, heater or fan NOT required
- IP66-rated for protection from rain and dust
- PoE (Power-over-Ethernet) and direct-wired power supply for power redundancy
- Vandal-proof form factor for preventing damage from unexpected external forces
- Versatile installation options for outdoor environments

Advanced Network Capability for Efficient Video Transmissions

Moxa's VPort series industrial video encoders allow customers to deploy video surveillance network systems with better network management parameters for high-performance video transmissions. By supporting the Modus/TCP protocol, users can seamlessly integrate Moxa's video solutions with SCADA/HMI systems. Several advanced network functions include RSTP video streaming for easy integration, IGMP protocols for efficient network transmission, QoS to increase the determinism of the video stream, and SNMP for easy network management.

User-friendly Video-over-IP Surveillance Software for Application Versatility

In addition to video transmission and Ethernet infrastructure products, Moxa also provides video surveillance software solutions for building an IP video surveillance system. These software solutions contain NVR (network video recording) software that supports from 4 to 64 channels, plus CMS (central management system) software for managing multiple NVR systems, making it possible to manage much larger systems made up of an unlimited number of cameras.



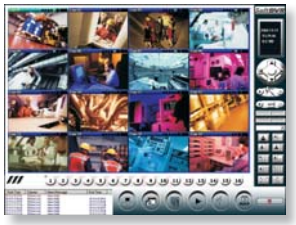
SoftNVR

Expandable network video recording software for managing up to 64 channels of video cameras.

- Multi-screen viewing format
- Dual monitor capability
- Video analytics and instant response
- Video quality enhancement tools
- Intelligent and convenient video search

SoftDVR

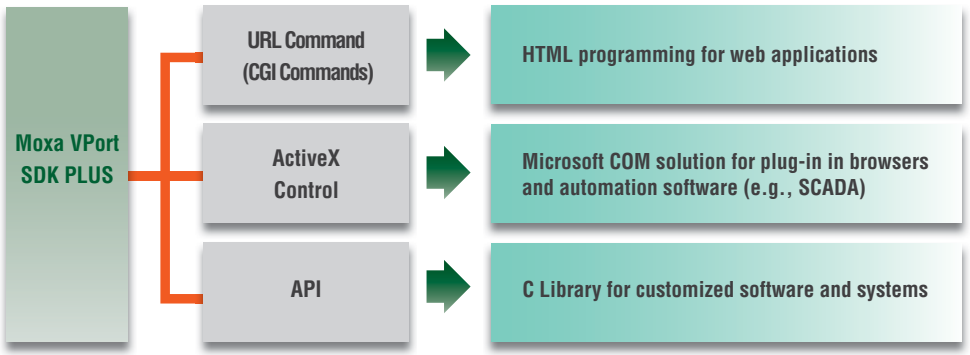
Standalone network video recording software for managing up to 16 channels of video cameras.



- Multi-screen viewing format
- Event-driven recording
- Search and playback are easy to use
- Store data to network hard disk
- Set schedule for recording and activating alarms
- Remote access by web browser

Free Software Development Kit for Third-party Software Developers and System Integrators

Most video surveillance systems require customized video management functions, or must be integrated with other applications, such as SCADA systems, access control systems, or fire alarm systems. For this reason, a user-friendly SDK (software development kit) is a good tool to have available for building customized video management systems. Moxa's VPort SDK PLUS, which includes CGI Commands, ActiveX, and a C library, is available free of charge to system integrators and third-party software developers. Learning to use VPort SDK PLUS is easy, and detailed documentation and sample code is provided for quick reference. For detailed information about SDK PLUS, please refer to the "SDK" introduction in this catalog.



Coming Soon

VPort 354 Series

Preliminary

Full motion, 4-channel MJPEG/MPEG4 industrial video encoders

- Industrial design with -40 to 75°C operating temperature and fiber optic Ethernet port
- 2 Ethernet ports for cascade and port redundancy
- SD card slot for local storage capability
- Modbus/TCP supported for easy communication with SCADA software
- Video stream up to 120 frames/sec at 4CIF (704 x 480) resolution

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The VPort 354 is a high performance, 4-channel industrial video encoder that provides up to 4CIF full frame rate performance (NTSC: 704 x 480 @ 30 FPS; PAL: 704 x 576 @ 25 FPS) for each channel, and supports a dual MJPEG/MPEG4 algorithm, making it especially well-suited for use with distributed surveillance systems in critical industrial applications. In addition, a continuous pre/post event trigger video record function can help system administrators determine why an alarm was triggered, and 2-way audio is provided for the convenience of real-time communication between system administrators located at the central site, and engineers in the field.

Rugged Design for Mission-critical Industrial Environments

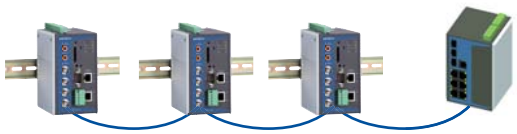
- -40 to 75°C wide operating temperature
- Built-in single-mode or multi-mode fiber optic Ethernet port—media converter not required
- 2 Ethernet ports for cascade and port redundancy
- 1 RS-232/422/485 COM port for controlling external serial devices over Ethernet
- Redundant 12/24 VDC and 24 VAC power inputs for greater reliability
- Metal housing with IP30 protection against dust
- DIN-Rail mounting installation for industrial environments
- UL508 (Pending) and Class I, Div. 2 (Pending) certified for hazardous locations
- Meets NEMA TS2, Section 2 requirements

Advanced Network Protocols Support Efficient Network Transmission and Integration

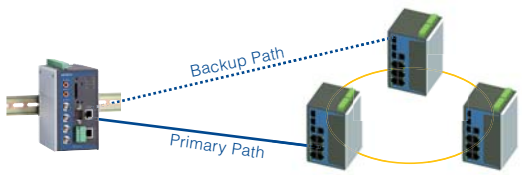
- Modbus/TCP for easy communication with SCADA software
- Standard RTSP (real-time streaming protocol) video streaming for easy integration
- Multicast (IGMP) protocols for efficient network transmission
- SNMPv1/v2c/v3 MIB-II for easy network management
- QoS (ToS) for configuring the transmission priority of video streams
- UPnP, DDNS, and IP filtering supported

Two Ethernet Ports for Cascading and Port Redundancy

The VPort 354 has two built-in 10/100 Mbps Ethernet ports for cascading multiple VPort 354 units. With the cascade feature, you'll need fewer switch ports, and also reduce your cable layout effort. An Ethernet by-pass function is also supported so that the cascade link will keep working if one of the VPort 354 units in the cascade chain goes offline. Port redundancy can be used to build a backup path for video transmission in case the primary path is broken.



Cascade Chain



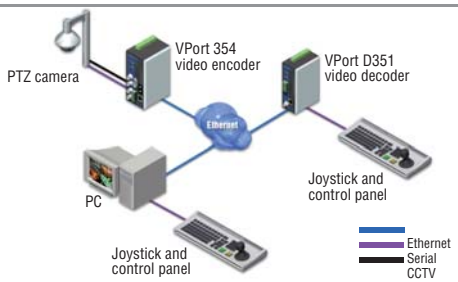
Port Redundancy

SD Card for Storing Video Locally when the Network is Down

The VPort 354 is equipped with an SD card socket (V2.0) for local storage purposes. Enable local storage to record events that occur when the network is down and the video stream cannot be transmitted.

Transparent PTZ Control for Easy Control of PTZ Cameras

The VPort 354 uses Moxa's Real COM technology to implement transparent communication for RS-232/422/485 PTZ control. The benefit of the Transparent PTZ Control function is that it eliminates the need to build the PTZ control driver into the VPort product, allowing the use of a legacy PTZ control panel or keyboard to control a PTZ camera directly.



Specifications

Video

Video Compression: MJPEG or MPEG4 (ISO/IEC 14496-2)

Video Stream: Dual streams (one for MJPEG, the other for MPEG4) at the same video resolution (note that MJPEG only has one quality setting)

Video Inputs: 4, BNC connector (1.0 Vpp, 75 ohms)

NTSC/PAL: Auto-sensing or manual

Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QCIF	176 x 120	30	176 x 144	25
CIF	352 x 240	30	352 x 288	25
2CIF	704 x 240	30	704 x 288	25
4CIF	704 x 480	30	704 x 576	25

Video Viewing:
- Adjustable image size and quality
- Timestamp and text overlay

Video Output: Via Ethernet port

Audio

Audio Inputs: 1 Line-in or MIC-in with RCA connector

Audio Outputs: 1 Line-out with RCA connector

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, Telnet, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS, SNMPv1/v2c/v3, DDNS

Ethernet: 2 10/100BaseT(X) auto negotiating RJ45 ports, or 2 100BaseFX fiber ports (single/multi-mode, SC connector)

Optical Fiber:

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Serial Port

PTZ Ports: 1, RS-232/422/485 port (terminal block connector), max. speed of 115.2 Kbps, with 15 KV ESD protection

COM Ports: 1, RS-232/422/485 (DB9 female connector), max. speed of 115.2 Kbps, with 15 KV ESD protection

Console Port: 1 RS-232 RJ45 port

GPIO

Digital Inputs: 4, max. 8 mA
- High: +13 to +30V
- Low: -30 to +3V

Relay Outputs: 2, max. 24 VDC @ 1 A

LED Indicators

STAT: Indicates if the system booted properly or not

PWR1: Power 1

PWR2: Power 2

FAULT: Can be configured to correspond to system alarm, power failure, video loss, or disconnected network

V1, V2, V3, V4: Video input signal activity

Local Storage

SD Socket: Standard SD socket, V2.0, with SD LED indicator

Power Requirements

Input Voltage: 2 12/24 VDC or 24 VAC inputs for redundancy

Power Consumption: Approx. 12 W

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)

Weight: 1200 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Alarms

Pre/Post Alarm: 9 MB memory for video recordings

Video Motion Detection: Includes sensitivity tuning

Video Loss: Video loss alarm

Scheduling: Daily repeat timing schedule

Imaging: JPEG snapshots for pre/trigger/post alarm images

Email/FTP Messaging: Automatic transfer of stored images via email or FTP with event-triggered actions

Custom Alarms: HTTP event servers for setting customized alarm actions

PAN/TILT/ZOOM

PTZ Camera Control: Via RS-232/422/485 PTZ port or COM port

PTZ Control Functions: PAN, TILT, ZOOM, FOCUS, moving speed, preset position (max. 25 positions), and 10 custom commands

PTZ Function Updates: Driver upload supported

Supported Devices and Protocols: Pelco D, Pelco P, Dynacolor DynaDome, Custom Camera

Transparent PTZ Control: Control PTZ cameras with legacy PTZ control panel or keyboard connected to a PC or VPort decoder

Security

Password: User level password protection

Filtering: By IP address

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508 (Pending)
EMS:
EN61000-4-2 (ESD), level 2
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-12 (Oscillatory wave immunity), level 3
EMI: FCC Part 15, CISPR (EN55022) class A
Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C and D (Pending); ATEX Class I, Zone 2, Ex nC IIC (Pending)
Traffic Control: NEMA TS2
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

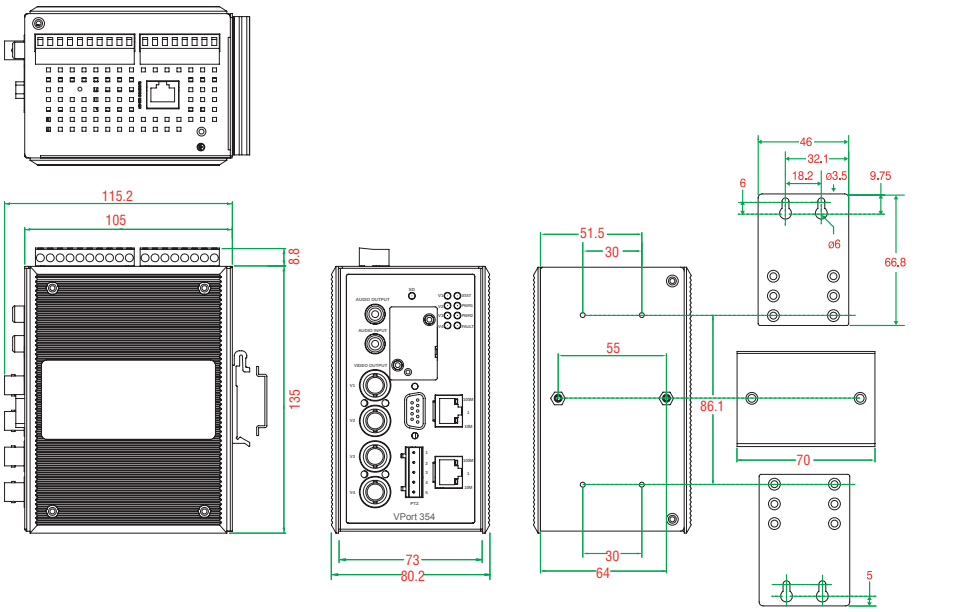
System Requirements

CPU: Pentium 4, 2.4 GHz or above
Memory: 512 MB memory or above
OS: Windows XP/2000 with SP2 or above
Browser: Internet Explorer 6.x or above
Multimedia: DirectX 9.0c or above

Software Bundled Free

SoftDVR™ Lite: 1 to 4-ch IP surveillance software for viewing and recording
VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is vailable for download from Moxa's website).

Dimensions (unit = mm)



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface		
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	Multi-mode, SC Connector	Single-mode, SC Connector
VPort 354	VPort 354-T	2	---	---
VPort 354-MM-SC	VPort 354-MM-SC-T	---	2	---
VPort 354-SS-SC	VPort 354-SS-SC-T	---	---	2

Optional Accessories (can be purchased separately)

SoftNVR: Expandable IP surveillance software for managing up to 64 video channels
SoftDVR™ Pro: 16-channel IP surveillance software for viewing and recording
DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

VPort 254 Series

Rugged 4-channel MJPEG/MPEG4 industrial video encoders

- Industrial design with -40 to 75°C operating temperature and fiber optic Ethernet port
- Video stream up to 120 frames/sec at CIF (352 x 240) resolution
- Modbus/TCP supported for easy communication with SCADA software
- One RS-232/422/485 COM port for controlling external serial devices over Ethernet
- Free VPort SDK PLUS and 4-channel video surveillance software

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The rugged VPort 254 is a 4-channel industrial video encoder that provides up to 120 FPS at CIF resolution (NTSC: 352 x 240; PAL: 352 x 288), and supports an optional MJPEG/MPEG4 algorithm, making it especially well suited for use with distributed surveillance systems in critical industrial applications. In addition, the VPort 254 supports serial-to-Ethernet and Modbus/TCP communications for integrating automation systems, and 2-way audio is provided to allow real-time communication between system administrators located at a central site and engineers in the field.

Rugged Design for Mission-critical Industrial Environments

- Operates reliably in -40 to 75°C environments
- Built-in single-mode or multi-mode fiber optic Ethernet port (media converter not required)
- More reliable with redundant 12/24 VDC and 24 VAC power inputs
- Metal form factor with IP30 protection against dust
- DIN-Rail mounting installation suitable for industrial environments
- UL508 certified for industrial environments

Advanced Network Protocols for Efficient Network Transmission and Integration

- Modbus/TCP for easy communication with SCADA software
- Standard RTSP (real-time streaming protocol) video streaming for easy integration
- Multicast (IGMP) protocols for efficient network transmission
- SNMPv1/v2c/v3 MIB-II for easy network management
- QoS (ToS) for configuring the transmission priority of video streams
- UPnP, DDNS, and IP filtering supported

Specifications

Video

Video Compression: MJPEG or MPEG4 (ISO/IEC 14496-2)

Video Inputs: 4, BNC connector (1.0 Vpp, 75 ohms)

NTSC/PAL: Auto-sensing or manual

Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QVGA	320 x 240	30	320 x 288	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	7	640 x 576	7
4CIF	704 x 480	7	704 x 576	7
Full D1	720 x 480	7	720 x 576	7

Video Viewing: Adjustable image size and quality

Audio

Audio Inputs: 1 Line-in or MIC-in with RCA connector

Audio Outputs: 1 Line-out with RCA connector

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, Telnet, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS (ToS), SNMPv1/v2c/v3, DDNS, Modbus/TCP

Ethernet: 1 10/100BaseT(X) auto negotiating RJ45 port, or 1 100BaseFX fiber port (single/multi-mode, SC connector)

Optical Fiber:

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Serial Port

PTZ Ports: 1, RS-232/422/485 port (terminal block connector), max. speed of 115.2 Kbps, with 15 KV ESD protection

COM Ports: 1 RS-232/422/485 port (DB9 female connector), max. speed of 115.2 Kbps, with 15 KV ESD protection

Console Port: 1 RS-232 RJ45 port

GPIO

Digital Inputs: 4, max. 8 mA
• High: +13 to +30V
• Low: -30 to +3V

Relay Outputs: 2, max. 24 VDC @ 1 A

LED Indicators

STAT: Indicates if the system booted properly or not

PWR1: Power 1

PWR2: Power 2

FAULT: Can be configured to correspond to system alarm, power failure, video loss, or disconnected network

V1, V2, V3, V4: Video input signal activity

Power Requirements

Input Voltage: 2 12/24 VDC or 24 VAC inputs for redundancy

Power Consumption: Approx. 12 W

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)

Weight: 1100 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Alarms

Video Motion Detection: Includes sensitivity tuning

Video Loss: Video loss alarm

Scheduling: Daily repeat timing schedule

Imaging: JPEG snapshots for pre/trigger/post alarm images

Email/FTP Messaging: Automatic transfer of stored images via email or FTP with event-triggered actions

Custom Alarms: HTTP event servers for setting customized alarm actions

PAN/TILT/ZOOM

PTZ Camera Control: Via RS-232/422/485 PTZ port or COM port

PTZ Control Functions: PAN, TILT, ZOOM, FOCUS, moving speed, preset position (max. 25 positions), and 10 custom commands

PTZ Function Updates: Driver upload supported

Supported Devices and Protocols: Pelco D, Pelco P, Dynacolor DynaDome, Custom Camera

Transparent PTZ Control: Control PTZ cameras with legacy PTZ control panel or keyboard connected to a PC or VPort decoder

Security

Password: User level password protection

Filtering: By IP address

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508

EMS:
EN61000-4-2 (ESD), level 2
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-12 (Oscillatory wave immunity), level 3

EMI: FCC Part 15, CISPR (EN55022) class A

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C and D (Pending); ATEX Class I, Zone 2, Ex nC IIC (Pending)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time: 200,000 hrs

Database: MIL-HDBK-217F, GB 25°C

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

System Requirements

CPU: Pentium 4, 2.4 GHz or above

Memory: 512 MB memory or above

OS: Windows XP/2000 with SP2 or above

Browser: Internet Explorer 6.x or above

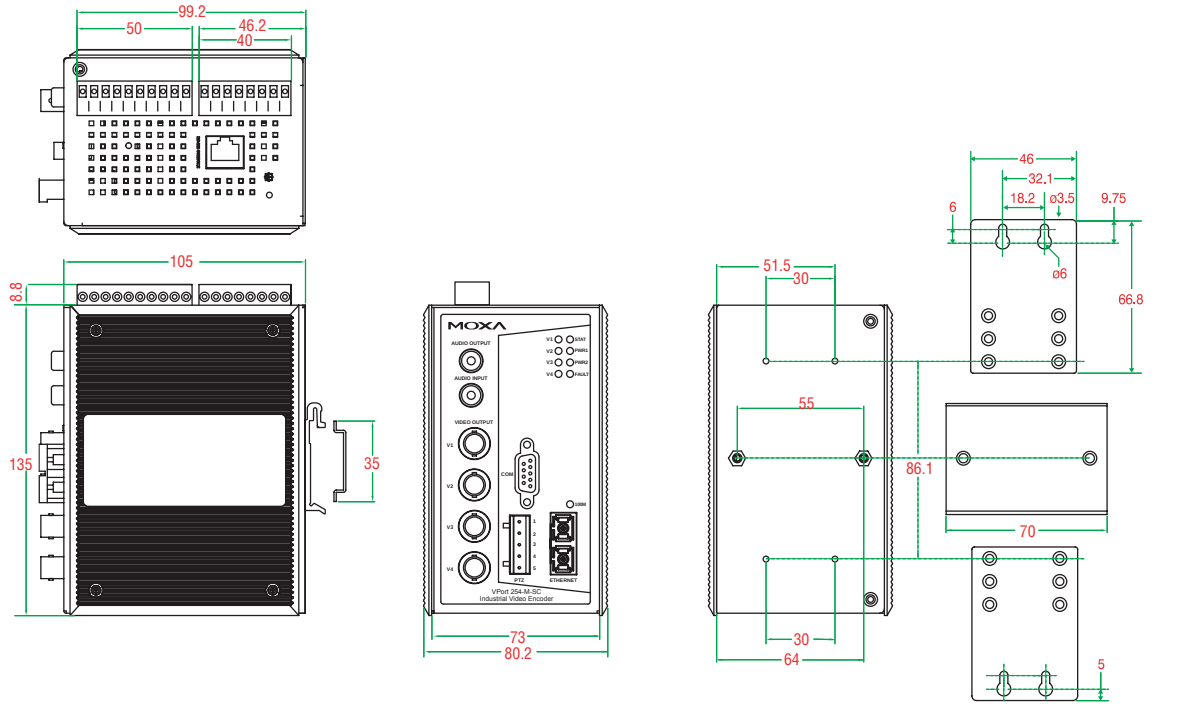
Multimedia: DirectX 9.0c or above

Software Bundled Free

SoftDVR™ Lite: 1 to 4-ch IP surveillance software for viewing and recording

VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is vailable for download from Moxa's website).

Dimensions (unit = mm)



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface		
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	Multi-mode, SC Connector	Single-mode, SC Connector
VPort 254	VPort 254-T	1	---	---
VPort 254-M-SC	VPort 254-M-SC-T	---	1	---
VPort 254-S-SC	VPort 254-S-SC-T	---	---	1

Optional Accessories (can be purchased separately)

SoftNVR: Expandable IP surveillance software for managing up to 64 video channels
SoftDVR™ Pro: 16-channel IP surveillance software for viewing and recording
DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

VPort 351 Series

Full motion, 1-channel MJPEG/MPEG4 industrial video encoder

- **Industrial design with -40 to 75°C operating temperature and fiber optic Ethernet port**
- **Video stream up to 30 frames/sec at full D1 (720 x 480) resolution**
- **Pre/post-alarm video recording function for advanced surveillance**
- **2-way (1-in/1-out) audio supported**
- **Free VPort SDK PLUS and 4-channel video surveillance software**

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The VPort 351 is a high performance, 1-channel industrial video encoder that provides up to full D1, full frame rate performance (NTSC: 720 x 480 @ 30 FPS; PAL: 720 x 576 @ 25 FPS) and supports a dual MJPEG/MPEG4 algorithm, making it especially well-suited for use with distributed surveillance systems in critical industrial applications. In addition, a continuous pre/post event trigger video record function can help system administrators determine why an alarm was triggered, and 2-way audio is provided for the convenience of real-time communication between system administrators located at the central site, and engineers in the field.

Rugged Design for Mission-critical Industrial Environments

- -40 to 75°C wide operating temperature
- Built-in single-mode or multi-mode optical fiber Ethernet port; no media converter required
- UL508 and Class 1, Div. 2 certified for hazardous locations
- Redundant 12/24 VDC and 24 VAC power inputs to ensure greater reliability
- Metal housing with IP30 protection against dust
- DIN-Rail mounting installation for industrial environments

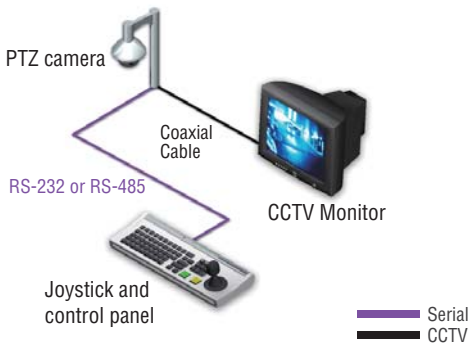
Advanced Network Protocols Support Efficient Network Transmission and Integration

- Standard RTSP (real-time streaming protocol) video streaming for easy integration
- Multicast (IGMP) protocols for efficient network transmission
- SNMPv1/v2c/v3 MIB-II for easy network management
- QoS (ToS) for configuring the transmission priority of video streams
- UPnP, DDNS, and IP filtering supported

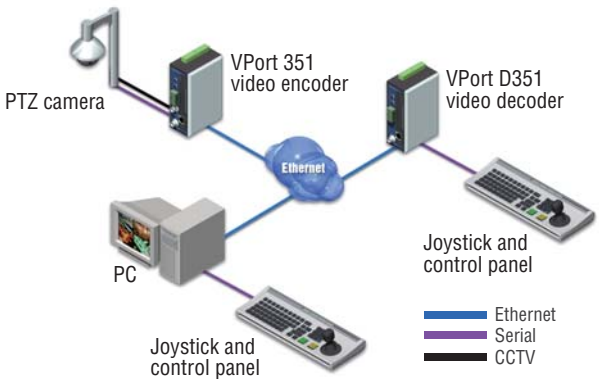
Transparent PTZ Control for Easy Control of PTZ Cameras

The VPort 351 adopts Moxa's Real COM technology to implement transparent communication for RS-232/422/485 PTZ control. The benefit of this transparent PTZ control function is that it eliminates the need to build a PTZ control driver into the VPort product, since legacy PTZ control panels or keyboards can be used to control the PTZ camera directly.

Legacy PTZ Camera Control



Transparent PTZ Camera Control over Ethernet



Specifications

Video

Video Compression: MJPEG or MPEG4 (ISO/IEC 14496-2)

Video Inputs: 1, BNC connector (1.0 Vpp, 75 ohms)

Video Outputs: 1, loop-through BNC connector

NTSC/PAL: Auto-sensing or manual

Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QVGA	320 x 240	30	320 x 288	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 576	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25

Video Viewing:
- Adjustable image size and quality
- Timestamp and text overlay

Audio

Audio Inputs: 1 Line-in or MIC-in with 3.5 mm phone jack

Audio Outputs: 1 Line-out with 3.5 mm phone jack

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, Telnet, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS, SNMPv1/v2c/v3, DDNS

Ethernet: 1 10/100BaseT(X) auto negotiating RJ45 port, or 1 100BaseFX fiber port (Single/multi mode, SC connector)

Optical Fiber:

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Serial Port

PTZ Ports: 1, RS-232/422/485 port (terminal block connector), max. speed of 115.2 Kbps

Console Port: 1 RS-232 RJ45 port

GPIO

Digital Inputs: 2, max. 8 mA
- High: +13 to +30V
- Low: -30 to +3V

Relay Outputs: 2, max. 24 VDC @ 1 A

LED Indicators

STAT: Indicates if the system booted properly or not

PWR1: Power 1

PWR2: Power 2

FAULT: Can be configured to correspond to system alarm, power failure, video loss, or disconnected network

VIDEO: Video input signal active

AUDIO TEST: Audio input signal in test mode

PTZ: PTZ control signal active

Power Requirements

Input Voltage: 2 12/24 VDC or 24 VAC inputs for redundancy

Power Consumption: Max. 8 W

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 52.98 x 135 x 105 mm (2.09 x 5.31 x 4.13 in)

Weight: 960 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Alarms

Pre/Post Alarm: 9 MB memory for video recordings

Video Motion Detection: Includes sensitivity tuning

Video Loss: Video loss alarm

Scheduling: Daily repeat timing schedule

Imaging: JPEG snapshots for pre/trigger/post alarm images

Email/FTP Messaging: Automatic transfer of stored images via email or FTP with event-triggered actions

Custom Alarms: HTTP event servers for setting customized alarm actions

PAN/TILT/ZOOM

PTZ Camera Control: Via RS-232/422/485 PTZ port

PTZ Control Functions: PAN, TILT, ZOOM, FOCUS, moving speed, preset position (max. 25 positions), and 10 custom commands

PTZ Function Updates: Driver upload supported

Supported Device Protocols: Pelco D, Pelco P, Dynacolor DynaDome, Custom Camera

Transparent PTZ Control: Control PTZ cameras with legacy PTZ control panel or keyboard connected to a PC or VPort decoder

Security

Password: User level password protection

Filtering: By IP address

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508

EMS:
EN61000-4-2 (ESD), level 2
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-12 (Oscillatory wave immunity), level 3

EMI: FCC Part 15, CISPR (EN55022) class A

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C and D; ATEX Class I, Zone 2, Ex nC IIC

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time: 272,000 hrs

Database: MIL-HDBK-217F, GB 25°C

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

System Requirements

CPU: Pentium 4, 2.4 GHz or above

Memory: 512 MB memory or above

OS: Windows XP/2000 with SP2 or above

Browser: Internet Explorer 6.x or above

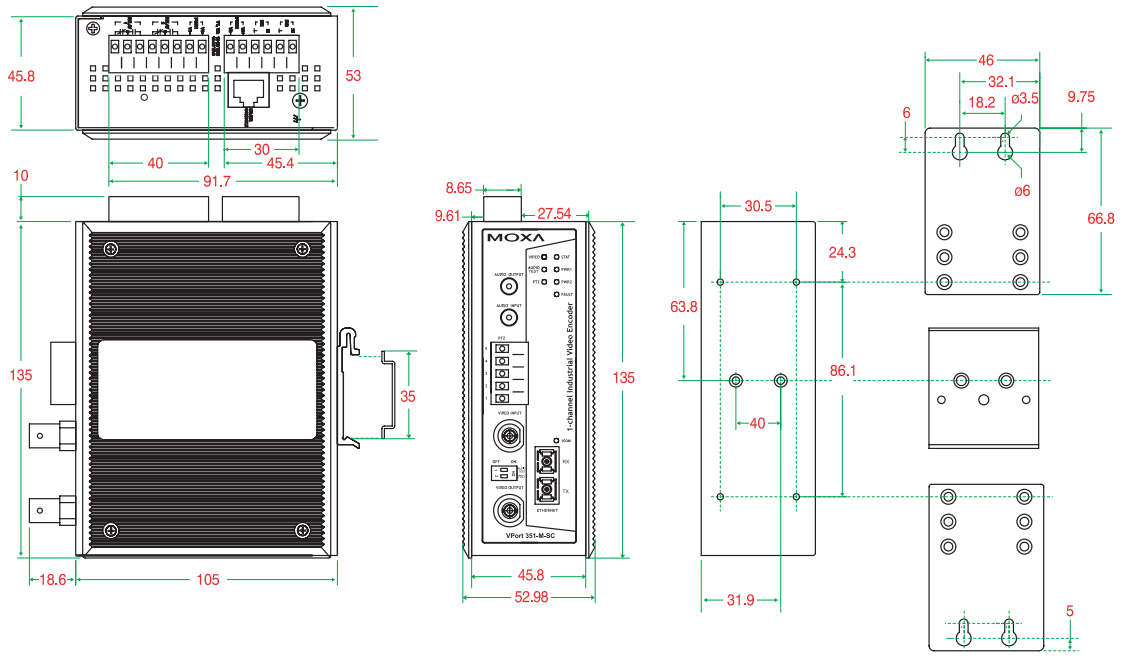
Multimedia: DirectX 9.0c or above

Software Bundled Free

SoftDVR™ Lite: 1 to 4-ch IP surveillance software for viewing and recording

VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is vailable for download from Moxa's website).

Dimensions (unit = mm)



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface		
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	Multi-mode, SC Connector	Single-mode, SC Connector
VPort 351	VPort 351-T	1	---	---
VPort 351-M-SC	VPort 351-M-SC-T	---	1	---
VPort 351-S-SC	VPort 351-S-SC-T	---	---	1

Optional Accessories (can be purchased separately)

SoftNVR: Expandable IP surveillance software for managing up to 64 video channels

SoftDVR™ Pro: 16-channel IP surveillance software for viewing and recording

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

VPort 3310 Series

Rugged 1-channel MPEG4 industrial video server (encoder)

- Industrial design with -40 to 75°C operating temperature
- Compress analog video/audio signals in MPEG4 video stream
- Multicast (IGMP) for transmission efficiency
- Video stream up to 30 frames/sec at CIF (352 x 240) resolution
- Free VPort SDK and 4-channel video surveillance software

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The VPort 3310 is a 1-channel industrial video server (encoder) that uses the standard MPEG4 algorithm, and features DIN-Rail mounting capability, 24 VDC redundant power inputs, and IP30 protection to meet the requirements of industrial environments. A cutting edge MPEG4 algorithm gives the VPort 3310 an FPS of up to 30 in CIF resolution (352 x 240), with maximum bandwidth of 1.6 Mbps, to provide high video performance and more efficient network transmission. In addition, the VPort 3310 also supports audio communication for a voice-over-IP solution, making the control of your video surveillance system more real-time.

Specifications

Video

Video Compression: MPEG4 (ISO/IEC 14496-2)
Video Inputs: 1, BNC connector (1.0 Vpp, 75 ohms)
Video Outputs: 1, loop-through BNC connector
NTSC/PAL: Auto-sensing or manual
Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QCIF	176 x 120	30	176 x 144	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	10	640 x 576	8
4CIF	704 x 480	10	704 x 576	8

Video Viewing:
- Adjustable image size and quality
- B/W or color control
- Timestamp and text overlay

Audio

Audio Inputs: 1 Line-in or MIC-in with 3.5 mm phone jack

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, RTSP, RTP, RTCP, NTP, DNS, DDNS, IGMPv3, SNMPv1/v2c/v3, DHCP, UPnP, PPPoE
Ethernet: 1 10/100BaseT(X) auto negotiating RJ45 port

Serial Port

COM Ports: 1, RS-232 (DB9 male connector) or RS-485 (terminal block connector), max. speed of 115.2 Kbps

GPIO

Digital Inputs: 2, max. 8 mA
- High: +13 to +30V
- Low: -30 to +3V

Relay Outputs: 2, max. 24 VDC @ 1 A

LED Indicators

PWR1: Power 1
PWR2: Power 2
FAULT: Power failure
VIDEO: Video input
AUDIO: Audio input
SERIAL: COM port status

Power Requirements

Input Voltage: 2 24 VDC power inputs for redundancy
Power Consumption: Max. 7.5 W

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 52.98 x 135 x 105 mm (2.09 x 5.31 x 4.13 in)
Weight: 790 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Alarms

Video Motion Detection: Includes sensitivity tuning
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Email/FTP Messaging: Automatic transfer of stored images via email or FTP with event-triggered actions

PAN/TILT/ZOOM

PTZ Camera Control: Via RS-232/485 port

Supported Device Protocol: Sony VISCA, Cannon VC-C1/VC-C3/ VC-C4, Samsung SmartDOME, Dynacolor DynaDOME, Pelco D protocol, Liling PIH-7x00, Ernitec, Custom Camera

Detection: Automatic PTZ camera model detection

Security

Password: User level password protection

Filtering: By IP address

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

EMI: FCC Part 15, CISPR (EN55022) class B

EMS:
EN61000-4-2 (ESD), level 2
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 4
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11
EN61000-4-12

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time: 152,000 hrs

Database: MIL-HDBK-217F, GB 25°C

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

System Requirements

CPU: Pentium 4, 2.4 GHz or above

Memory: 512 MB memory or above

OS: Windows XP/2000 with SP2 or above

Browser: Internet Explorer 6.x or above

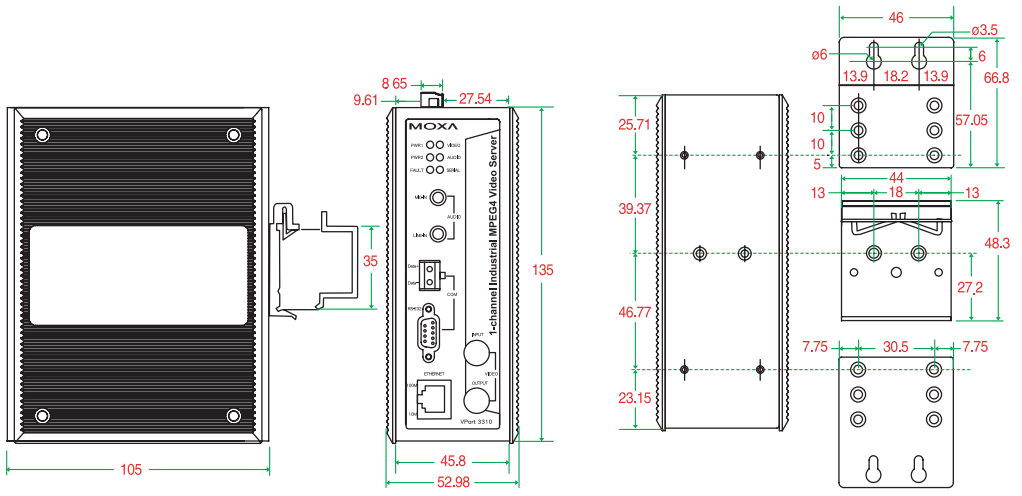
Multimedia: DirectX 9.0c or above

Software Bundled Free

SoftDVR™ Lite: 1 to 4-ch IP surveillance software for viewing and recording

VPort SDK: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (please contact a Moxa sales representative for details).

Dimensions (unit = mm)



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models

VPort 3310: 1-channel MPEG4 industrial video server with 24 VDC redundant power inputs, 0 to 60°C operating temperature

VPort 3310-T: 1-channel MPEG4 industrial video server with 24 VDC redundant power inputs, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

SoftDVR™ Pro: 16-channel IP surveillance software for viewing and recording

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

VPort 2141

Compact, 4-channel MJPEG video server (encoder)

- Compress analog video signals in MJPEG video streams
- Video stream up to 30 frames/sec at CIF (352 x 240) resolution, and 15 frames/sec at Quad view
- PPPoE, DDNS, UPnP, and IP filtering supported
- Free VPort SDK and 4-channel video surveillance software

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The VPort 2141 video server comes equipped with a 4-channel video input image digitizer, image compressor with MJPEG compression, and web server accessible through a 10/100 Mbps Ethernet port. With the VPort 2141, you can digitize analog video sources and distribute digital images over an IP network to turn your CCTV system into a true "Video-over-IP" network system.

Specifications

Video

Video Compression: MJPEG

Video Inputs: 4, BNC connector (1.0 Vpp, 75 ohms)

NTSC/PAL: Auto-sensing or manual

Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QCIF	176 x 120	30	176 x 144	25
CIF	352 x 240	30	352 x 288	25
4CIF	704 x 480	10	704 x 576	8
Quad		15		15

Video Viewing:
- Adjustable image size and quality
- B/W or color control
- Timestamp and text overlay
- 5 privacy masks for each camera

Network

Protocols: TCP, HTTP, SMTP, FTP, NTP, DNS, DHCP, PPPoE, DDNS, UPnP

Ethernet: 1 10/100BaseT(X) auto negotiating RJ45 port

Serial Port

COM1 Port: RS-232 (DB9 male connector), max. speed of 115.2 Kbps

COM2 Port: RS-485 (terminal block connector), max. speed of 115.2 Kbps

GPIO

Digital Inputs: 4, max. 12 VDC @ 50 mA

Relay Outputs: 4, max. 24 VDC @ 1 A, 125 VAC @ 0.5 A

LED Indicators

Network: ACTIVE, LINK, FDX (full duplex)

System: POWER, CONNECT, SERIAL

Power Requirements

Input Voltage: 12 VDC, 1.5 A

Power Consumption: Approx. 8 W

Alternative Power Input: Terminal block for 12 to 15 VDC/VAC, min. 1.5A

Power Output: Terminal block for 12 VDC, max. 500 mA

Physical Characteristics

Housing: Metal

Dimensions: 146.2 x 163.2 x 40 mm (5.76 x 6.43 x 1.57 in)

Weight: 820 g

Installation: DIN-Rail mounting (with optional kit), wall mounting

Alarms

Video Motion Detection: Includes sensitivity tuning

Scheduling: Daily repeat timing schedule

Imaging: JPEG snapshots for pre/trigger/post alarm images

Email/FTP Messaging: Automatic transfer of stored images via email or FTP with event-triggered actions

PAN/TILT/ZOOM

PTZ Camera Control: Via RS-232/485 port

Supported Device Protocol: Sony VISCA, Cannon VC-C1/VC-C3/VC-C4, Samsung SmartDOME, Dynacolor DynaDOME, Pelco D protocol, Liling PIH-7x00, Ernitec, Custom Camera

Detection: Automatic PTZ camera model detection

Security

Password: User level password protection

Filtering: By IP address

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

Storage Temperature: -40 to 70°C (-40 to 158°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: CE

EMI: FCC

Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

System Requirements

CPU: Pentium 4, 2.4 GHz or above

Memory: 512 MB memory or above

OS: Windows XP/2000 with SP2 or above

Browser: Internet Explorer 6.x or above

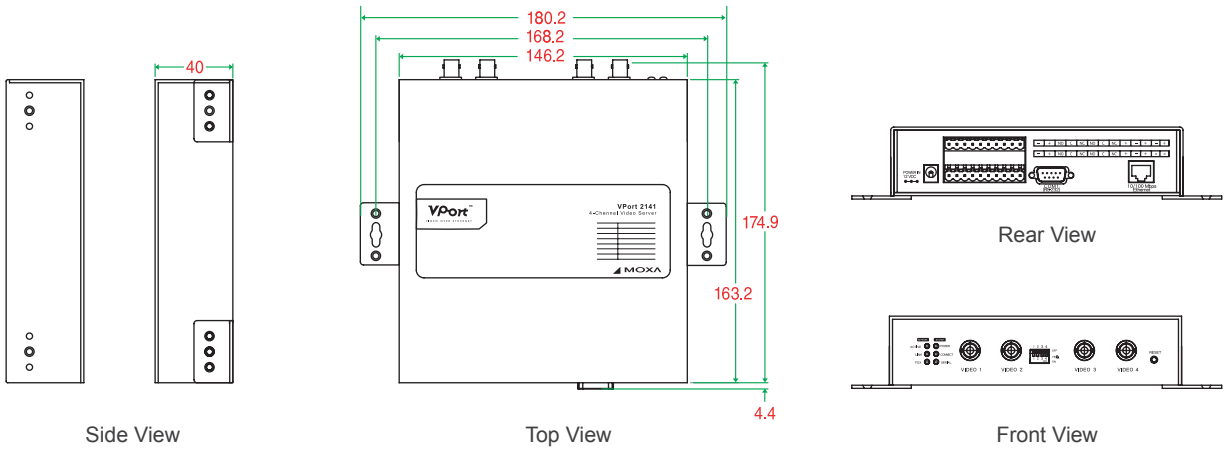
Multimedia: DirectX 9.0c or above

Software Bundled Free

SoftDVR™ Lite: 1 to 4-ch IP surveillance software for viewing and recording

VPort SDK: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (please contact a Moxa sales representative for details).

Dimensions (unit = mm)



Ordering Information

Available Models

VPort 2141: 4-channel MJPEG video server with 100-240 V power adaptor (12 VDC, 1.5A, or 12 VDC, 1.25A for UK plug)

Optional Accessories (can be purchased separately)

SoftDVR™ Pro: 16-channel IP surveillance software for viewing and recording

DK-35A: DIN-Rail mounting kit (35 mm)

VPort 251

Full motion, 1-channel MJPEG/MPEG4 video encoder

- Compress analog video/audio signals into MJPEG/MPEG4 video streams
- Video stream up to 30 frames/sec at full D1 (720 x 480) resolution
- 2-way (1-in/1-out) audio supported
- Transparent PTZ control for using legacy PTZ control panel or keyboard
- Loop-through power output for powering an analog camera
- Free VPort SDK PLUS and 4-channel video surveillance software

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The VPort 251 is a high performance, 1-channel video encoder with compact form factor that is suitable for installation in a variety of locations, including outdoor camera cabinets. To make installation easier, the VPort 251 supports both panel mounting and DIN-Rail mounting (with DK-35A accessory), and 1 loop-through power output for powering an analog camera. In addition, the VPort 251 provides up to full D1, full frame rate video performance (NTSC: 720 x 480 up to 30 FPS; PAL: 720 x 576 up to 25 FPS) and supports both MJPEG or MPEG4, making it especially well-suited for use with distributed video surveillance systems, and a 2-way audio function is provided for the convenience of real-time communication between system administrators located at the central site, and engineers in the field.

Specifications

Video

Video Compression: MJPEG or MPEG4 (ISO/IEC 14496-2)
Video Inputs: 1, BNC connector (1.0 Vpp, 75 ohms)
Video Outputs: Via Ethernet port (1.0 Vpp, 75 ohms)
NTSC/PAL: Auto-sensing or manual
Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QVGA	320 x 240	30	320 x 288	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 576	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25

Video Viewing:
- Adjustable image size and quality
- Timestamp and text overlay

Audio

Audio Inputs: 1 Line-in or MIC-in with 3.5 mm phone jack
Audio Outputs: 1 Line-out with 3.5 mm phone jack

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, Telnet, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS, DDNS, SNMPv1/v2c/v3
Ethernet: 1 10/100BaseT(X) auto negotiating RJ45 port

Serial Port

PTZ Ports: 1, RS-232/422/485 (terminal block connector), max. 115.2 Kbps
Console Port: 1 RS-232 RJ45 port

GPIO

Digital Inputs: 1, max. 8 mA
- High: +13 to +30V
- Low: -30 to +3V

Relay Outputs: 1, max. 24 VDC @ 1 A

LED Indicators

STAT: Indicates if the system booted properly or not
VIDEO: Video input signal active
PTZ: PTZ control signal active

Power Requirements

Input Voltage: 12/24 VDC or 24 VAC input
Power Consumption: Approx. 7.5 W
Power Output: 2-pin terminal block connector for loop-through from power input

Physical Characteristics

Housing: Metal
Dimensions: 88.2 x 106 x 50 mm (3.47 x 4.17 x 1.97 in)
Weight: 850 g
Installation: DIN-Rail mounting (with optional kit), wall mounting

Alarms

Video Motion Detection: Includes sensitivity tuning
Video Loss: Video loss alarm
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Email/FTP Messaging: Automatic transfer of stored images via email or FTP with event-triggered actions
Custom Alarms: HTTP event servers for setting customized alarm actions

PAN/TILT/ZOOM

PTZ Camera Control: Via RS-232/422/485 PTZ port

PTZ Control Functions: PAN, TILT, ZOOM, FOCUS, moving speed, preset position (max. 25 positions), and 10 custom commands

PTZ Function Updates: Driver upload supported

Supported Device Protocols: Pelco D, Pelco P, Dynacolor DynaDome, Custom Camera

Transparent PTZ Control: Control PTZ cameras with legacy PTZ control panel or keyboard connected to a PC or VPort decoder

Security

Password: User level password protection

Filtering: By IP address

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

EMS:
EN61000-4-2 (ESD), level 2
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-12 (Oscillatory wave immunity), level 3

EMI: FCC Part 15, CISPR (EN55022) class A

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time: 280,000 hrs

Database: MIL-HDBK-217F, GB 25°C

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

System Requirements

CPU: Pentium 4, 2.4 GHz or above

Memory: 512 MB memory or above

OS: Windows XP/2000 with SP2 or above

Browser: Internet Explorer 6.x or above

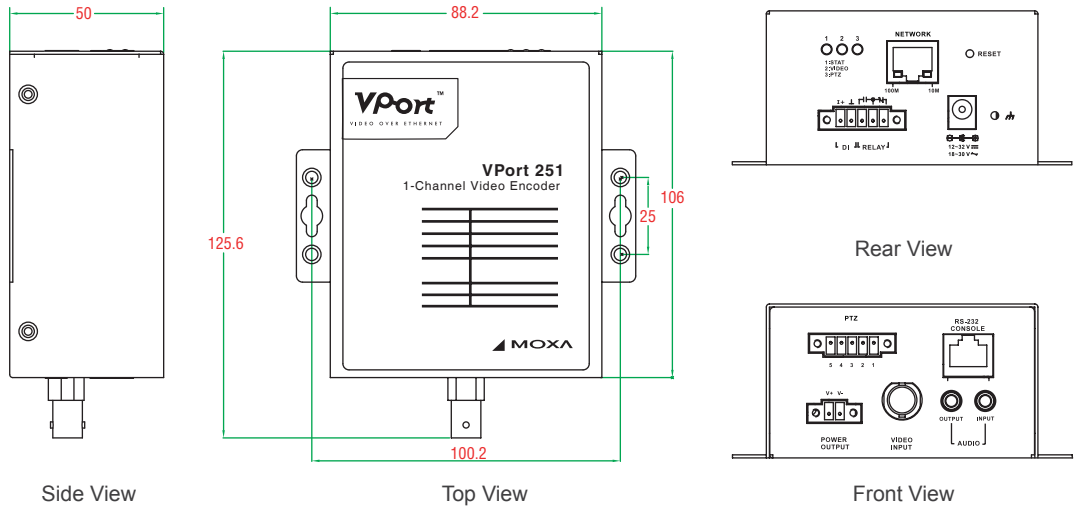
Multimedia: DirectX 9.0c or above

Software Bundled Free

SoftDVR™ Lite: 1 to 4-ch IP surveillance software for viewing and recording

VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is vailable for download from Moxa's website).

Dimensions (unit = mm)



Side View | Top View | Rear View | Front View

Ordering Information

Available Models

VPort 251: 1-channel MJPEG/MPEG4 video encoder, 0 to 60°C operating temperature

Optional Accessories (can be purchased separately)

SoftNVR: Expandable IP surveillance software for managing up to 64 video channels

SoftDVR™ Pro: 16-channel IP surveillance software for viewing and recording

Power Adaptors:

- PWR-12120-USJP-S2: L-type (5.5/2.1/9.5) power adaptor, 1.2 A @ 12 VDC output, US/JP plug
- PWR-12120-DT-S2: S-type (5.5/2.1/7.5) power adaptor, 1.2 A @ 12 VDC output
- PWR-12200-DT-S1: S-type (5.5/2.1/7.5) power adaptor, 2 A @ 12 VDC output
- PWR-12120-AU-S2: L-type (5.5/2.1/9.0) power adaptor, 1.2 A @ 12 VDC output, AU plug
- PWR-12150-EU-S2: L-type (5.5/2.1/9.0) power adaptor, 1.5 A @ 12 VDC output, Euro plug
- PWR-12150-UK-S2: L-type (5.5/2.1/9.0) power adaptor, 1.5 A @ 12 VDC output, UK plug

DK-35A: DIN-Rail mounting kit (35 mm)

VPort D351

1-channel MJPEG/MPEG4 industrial video decoder

- Decode MJPEG and MPEG4 video streams to an analog video signal automatically
- Manual selection or automatic scan with maximum of 64 video sources
- 2-way (1-in/1-out) audio supported
- Transparent PTZ control with legacy PTZ controller
- SNMP for network management

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The VPort D351 is a 1-channel video decoder for decoding MPEG4/MJPEG video streams from VPort series video encoders (not including VPort 2110, VPort 2140, VPort 2310, VPort 2141, and VPort 3310) and VPort IP cameras back to analog video signals. The analog video signal can be sent to legacy CCTV devices, such as monitors, multiplexers, and matrix switches, which can be used as originally intended as part of CCTV systems. In addition, bi-directional audio enables ready-to-use voice-over-IP communication between the video encoder and decoder. Monitoring your cameras that are part of a large CCTV system is easy with the VPort D351, which can be set up to switch between different video sources either manually or automatically within a given time interval. Up to 64 video sources can be included in the list. In addition, the 2 DIs located on the top panel of the VPort D351 can be used to create 2 control buttons for up and down video source selection.

Specifications

Video

Video Decoding: MPEG4, MJPEG (auto-detecting)

Video Inputs: Accepts video streams from VPort series video encoders and VPort series IP cameras over TCP/IP networks (not included: VPort 2110, VPort 2140, VPort 2310, VPort 2141, VPort 3310)

Video Outputs: 1, BNC connector (1.0 Vpp, 75 ohms), NTSC or PAL

Video Resolution: Max. of 540 TVL lines

Video Sources: Up to 64, selected manually by web server or digital inputs, or selected automatically by scanning within a set time interval

Video Viewing:
- Max. 30/25 FPS (NTSC/PAL) can be decoded
- OSD (on-screen display) with video source, video source IP, date/time, and customized information

Audio

Audio Inputs: 1 Line-in or Mic-in with 3.5 mm phone jack

Audio Outputs: 1 Line-out with 3.5 mm phone jack

Network

Protocols: TCP, UDP, HTTP, SMTP, Telnet, NTP, DNS, DHCP, UPnP, RTP, RTSP, SNMPv1/v2c/v3

Ethernet: 1 10/100BaseT(X) auto negotiating RJ45 port

Serial Port

PTZ Ports: 1, RS-232/422/485 (terminal block connector), max. 115.2 Kbps

Console Port: 1 RS-232 RJ45 port

GPIO

Digital Inputs: 2, max. 8 mA
- High: +13 to +30V
- Low: -30 to +3V

Relay Outputs: 2, max. 24 VDC @ 1 A

LED Indicators

STAT: Indicates if the system booted properly or not

PWR1: Power 1

PWR2: Power 2

FAULT: Can be configured to correspond to system alarm, power failure, video loss, or disconnected network

Power Requirements

Input Voltage: 2 12/24 VDC or 24 VAC inputs for redundancy

Power Consumption: Max. 7.5 W

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 52.98 x 135 x 105 mm (2.09 x 5.31 x 4.13 in)

Weight: 910 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

PAN/TILT/ZOOM

PTZ Camera Control: Transparent PTZ camera control with legacy PTZ controller through the RS-232/422/485 PTZ port

Security

Password: User level password protection

Filtering: By IP address

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508

EMS:
EN61000-4-2 (ESD), level 2
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 2
EN61000-4-12 (Oscillatory wave immunity), level 3

EMI: FCC Part 15, CISPR (EN55022) class A

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time: 275,000 hrs

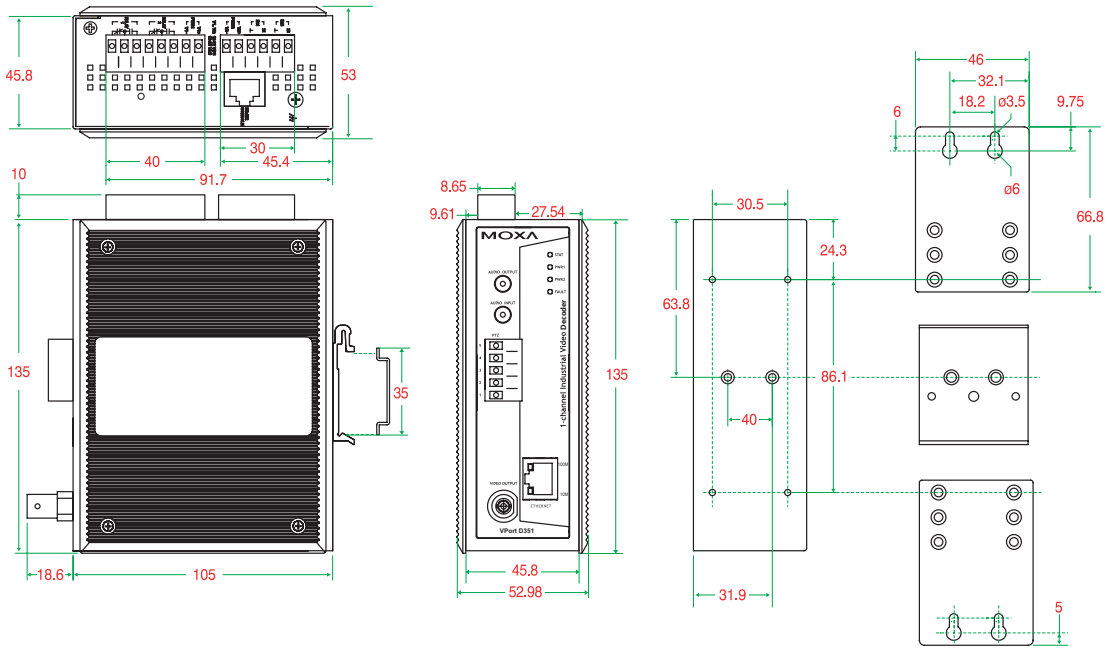
Database: MIL-HDBK-217F, GB 25°C

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models

VPort D351: 1-channel MJPEG/MPEG4 industrial video decoder, 0 to 60°C operating temperature

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

VPort 25 Series

IP66, day-and-night vandal-proof fixed dome IP camera for outdoors

- **-40 to 50°C operating temperature; heater or fan not required**
- **IP66-rated for protection from rain and dust**
- **Direct-wired power input and PoE for power redundancy**
- **Up to 30 frames/sec at 720 x 480 resolution**
- **One camera lens for both day and night use**

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The VPort 25 is a vandal-proof, IP66-rated, fixed dome IP camera for use in harsh, outdoor environments. With maximum resolution of 520 TVL and day-and-night CCD camera lens, the VPort 25 is especially well-suited for high performance video surveillance applications. To meet the outdoor environment requirements, the VPort 25 is IP66-rated to protect it against dust and rain. In addition, the vandal-proof form factor design prevents damage from unexpected external forces, and the case-open sensor sends an alarm message when the VPort 25's outer case is opened.

Heater and fan not required, supports direct-wired power input and PoE for power redundancy

The VPort 25's no-heater/fan-less embedded system provides greater reliability for outdoor use. In addition, the camera comes with redundant power inputs: (1) direct power connection (12/24 VDC and 24 VAC), and (2) PoE (IEEE 802.3af) power input.

High performance video, with full motion MJPEG/MPEG4 video stream

The VPort 25 uses the ASIC compression chip, which provides video performance up to full D1 (720 x 480) @ 30 FPS. To meet a wider range of customer requirements, the VPort 25 supports dual-codecs, including the MJPEG and MPEG4 algorithms.

Specifications

Camera

Sensor: 1/3" Sony Super HAD or 1/3" Sony ExView

Lens:
Wide-end: F1.4, diagonal 115.4°, horizontal 90.3°
Tele-end: F2.4, diagonal 39.8°, horizontal 31.9°
Focal Length: F= 3.7-12 mm

Modulation: NTSC or PAL

Camera Angle: Pan: ±180°; tilt: ±85°, rotation: ±170° (camera angles controlled manually)

Illumination:
Color: 0.2 Lux at F1.2
Black and white: 0.03 Lux at F1.2

Synchronization: Internal

Gamma Correction: 0.45

White Balance: Auto tracking white balance

Electronic Shutter Speed: 1/60 (50) second to 1/100,000 second, automatic

S/N Ratio: More than 50 dB (AGC off)

AGC Control: On/Off

Flickerless Control: On/Off

Backlight Compensation: On/Off

Mirror: On/Off

Auto Exposure, Auto Iris:
On: Auto exposure
Off: Auto iris

Horizontal Resolution: 420/520 TVL

Effective Pixels:
NTSC: 510 x 492 (middle resolution), 768 x 494 (high resolution)
PAL: 500 x 582 (middle resolution), 752 x 582 (high resolution)

Video

Video Compression: MJPEG or MPEG4 (ISO/IEC 14496-2)

Video Resolution:

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QVGA	320 x 240	30	320 x 288	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 576	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25

Video Viewing:
- Adjustable image size and quality
- Timestamp and text overlay

Video Output: Via Ethernet port or BNC connector (1.0 Vpp, 75 ohms)

Audio

Audio Input: 1 Line-in or MIC-in with 2-pin terminal block connector

Audio Output: 1 Line-out with 2-pin terminal block connector

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, Telnet, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS, SNMPv1/v2c/v3, DDNS

Ethernet: 1 10/100BaseT(X) auto negotiating RJ45 port

GPIO

Digital Inputs: 1, max. 8 mA
- High: +13 to +30V
- Low: -30 to +3V

Relay Output: 1, max. 24 VDC @ 1A

LED Indicators

STAT: Indicates if the system booted properly

Network: 1 LED for 10 Mbps, 1 LED for 100 Mbps

System: Power On/Off

DIP Switch: To turn the LED light On/Off

Power Requirements

Input Voltage: Redundant power inputs
- 12/24 VDC or 24 VAC with 2-pin terminal block connector
- Power-over-Ethernet (IEEE 802.3af)

Physical Characteristics

Housing: IP66-rated for rain and dust protection, vandal-proof supports

Dimensions: 142 x 118.9 mm (5.60 x 4.68 in)

Weight: 1100 g

Installation: Surface mounting, wall mounting

Alarms

Video Motion Detection: Includes sensitivity tuning

Video Loss: Video loss alarm

Case-open Sensor: Built in case-open sensor alarm

Scheduling: Daily repeat timing schedule

Imaging: JPEG snapshots for pre/trigger/post alarm images

Custom Alarms: HTTP event servers for setting customized alarm actions

Security

Password: User level password protection

Filtering: By IP address

Environmental Limits

Operating Temperature: -40 to 50°C (-40 to 122°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508 (Pending)

EMS:
EN61000-4-2 (ESD), level 2
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-12 (Oscillatory wave immunity), level 3

EMI: FCC Part 15, CISPR (EN55022) class A

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 1 year

Details: See www.moxa.com/warranty

System Requirements

CPU: Pentium 4, 2.4 GHz or above

Memory: 512 MB memory or above

OS: Windows XP/2000 with SP2 or above

Browser: Internet Explorer 6.x or above

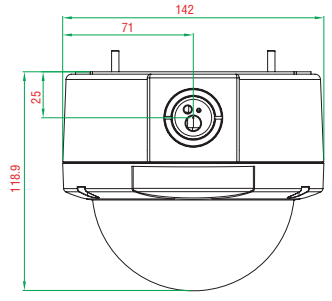
Multimedia: DirectX 9.0c or above

Software Bundled Free

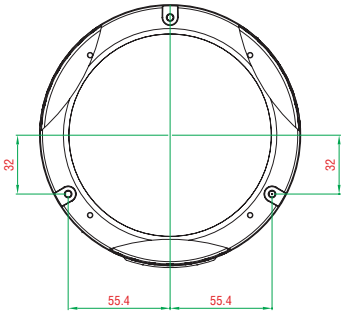
SoftDVR™ Lite: 1 to 4-ch IP surveillance software for viewing and recording

VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is vailable for download from Moxa's website).

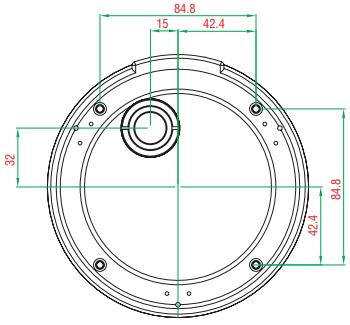
Dimensions (unit = mm)



Side View



Front View



Rear View

Ordering Information

Availabe Models	Camera Sensor		Modulation	
	SuperHAD	Exview	NTSC	PAL
VPort 25-CAM3S52N	√	---	√	---
VPort 25-CAM3S52P	√	---	---	√
VPort 25-CAM3E52N	---	√	√	---
VPort 25-CAM3E52P	---	√	---	√

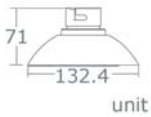
IP Camera Mounting Accessories

Mounting Kit

For mounting dome camera onto straight tube, gooseneck tube, or mini pendant

VP-MK

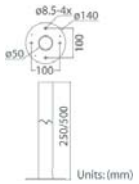
Height: 71 mm (2.8 in)
Diameter: 132.4 mm (5.21 in)
Weight: 300 g (0.7 lbs)



Straight Tube

VP-ST1 or VP-ST2

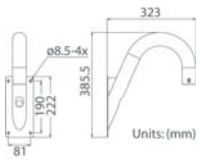
Height: 250 mm (9.84 in) or 500 mm (19.69 in)
Diameter: 50 mm (1.97 in)
Weight: 1000 g (2.2 lbs)/1800 g (4 lbs)



Gooseneck Tube

VP-GT

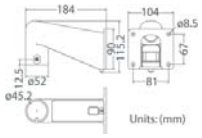
Dimensions: 323 x 385 mm (11.73 x 15.16 in)
Diameter: 92 x 42 mm (3.62 x 1.65 in)
Weight: 2100 g (4.6 lbs)



Mini Pendant

VP-MP

Dimensions:
184 x 104 x 115.2 mm (7.24 x 4.09 x 4.54 in)
Diameter: 44.5 mm (1.75 in)
Weight: 600 g (1.3 lbs)

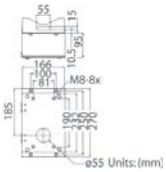


Wall Box Mounting

For mounting gooseneck and mini pendants on a wall

VP-WBM

Dimensions:
270 x 166 x 95 mm (10.63 x 6.54 x 3.74 in)
Weight: 2200 g (4.8 lbs)

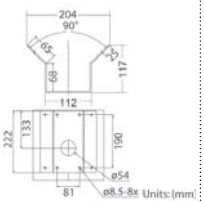


Standard Corner Mounting Plate

For mounting gooseneck and mini pendants in a corner

VP-CST

Dimensions:
222 x 204 x 117 mm (8.74 x 8.03 x 4.61 in)
Weight: 2000 g (4.4 lbs)



Mini Corner Plate

For mounting gooseneck and mini pendants in a corner

VP-CSTM

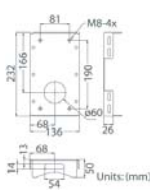
Dimensions:
270 x 166 x 95 mm (10.63 x 6.54 x 3.74 in)
Weight: 800 g (1.8 lbs)

Outdoor Thin Pole Direct Mounting

For mounting gooseneck and mini pendants on a pole

VP-PTD

Dimensions:
232 x 136 x 50 mm (9.13 x 5.35 x 1.97 in)
Recommended Pole Diameter:
112 to 140 mm (4.4 to 5.5 in)
Weight: 700 g (1.6 lbs)

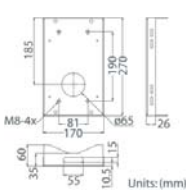


Outdoor Wide Pole Direct Mounting

For mounting gooseneck and mini pendants on a pole

VP-PWD

Dimensions:
270 x 170 x 60 mm (10.63 x 6.69 x 2.36 in)
Recommended Pole Diameter:
112 to 130 mm (4.4 to 5 in)
Weight: 1000 g (2.2 lbs)



Stainless Steel Straps

For direct pole mounting or mounting a pole box on a pole

VP-SS1

Length: 700 mm (27.56 in)
Width: 16 mm (0.63 in)
Weight: 20 g (0.04 lbs)
Note: Four straps are shipped with each order

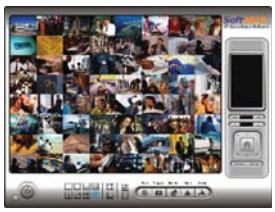
SoftNVR

Expandable IP surveillance software for managing up to 64 video channels

Moxa's SoftNVR IP surveillance software can be used to record video over the network and manage up to 64 video stream channels generated by VPort series products (not including the VPort 2000 series and VPort 3310) simultaneously. Features include dual monitor display, video analysis, instant alarm, event recording, and video enhancement tools. SoftNVR gives users an advanced video management tool for medium to large video surveillance networking systems.

Features

- Up to 64 channels in one system



- Dual monitor display capability for convenient viewing

- Video analysis with moving objects, and video loss detection

- Instant response for alarm notification

- Simple and user-friendly setup for recording schedules

- Multifunction playback system with intelligent search

- Video enhancement tools for image quality tuning

- I/O device integration

- Live viewing from popular web browsers

Introduction

Live Display

- Display a maximum of 64 channels, which could be configured for different modes, and in full screen.
- Dual monitor support:
  - Focus on important areas: Users can set one screen to monitor general cameras and the other to monitor important cameras.
  - Live view and playback at the same time: Users can set one screen to watch a live view, and use the other to play back images.
  - A "Detected Event" for the spot monitor application can pop up in the secondary monitor while the primary one is viewing live video.
- Adjustable monitor windows: Supports 1, 4, 6, 9, 10, 13, 16, 25, 36, 49, or 64 divided windows in full screen and when using the "display in turns" function.
- Multiple views: Show images from one video source on multiple screens.

PTZ control

- PTZ preset point: Save the definition of PTZ camera lens as a preset point and allow camera to move quickly to that location.
- Patrol: Allow camera to patrol an area based on a combined set of preset points.
- Digital PTZ:
  - Focus on any location you would like to highlight.
  - "Digital PTZ" and "Multiple Show" allow you to put the focus from single video resource anywhere you want.

Smart Detection

- Smart detection of 9 different events
  - General Motion
  - Missing Object
  - Foreign Object
  - Lose Focus
  - Camera Occlusion
  - Signal Lost
  - Signal Digital Input
  - System alarm at Disk Space Exhausted
  - System alarm at System Health Unusual
- Instant response for event alarms
  - On Screen Display
  - Play Sound
  - Send E-mail
  - PTZ Preset Go
  - Signal Digital Output

Recording and Schedule

- Video compression with MPEG4 and MJPEG.
- Record synchronized audio and video.
- Auto recycling when storage disk is full.
- Recording modes: Continuous record, record by event, record by digital input, record by motion, record by schedule, and manual recording.
- Recording schedule: Record daily, weekly, or by repeat schedule.
- Videos and images can be saved in outer storage devices such as DAS, NAS, or SAN without any limitations; useful if you need to increase your storage space in the future.

Remote Access

- Remote Live View by client program and web browser.
- Remote Playback by client program and web browser.
- Remote control PTZ camera.

Playback & Search

- Play back a maximum of 16 channels under different modes and in full screen.
- Intelligent search and smart search modes by event, area, camera, date, time, or log file.
- Administrator can configure the path to the recording database, without limitation. Unlimited support for additional storage devices.
- A search for a recorded video is based on the time period and event, which is the easiest and most efficient way to find the target recorded video.
- Complete playback control: Playback, reverse playback, fast forward.
- Digital zoom in to a specific area.
- Export video to AVI or ASF files.
- Export a single frame to a BMP or JPEG file and print it out.
- Back up the video by burning it to a disc and onto the hard disk.
- Video enhancement: Visibility, sharpness, brightness, contract, grayscale.

System

- User-friendly control interface; no complicated control window, making it easy for anyone with basic computer knowledge to use.
- Administrator can auto login from a certain account, and enable, add, edit, and delete users without limitation. Configure access rights for users.
- Only the users in the administrator group can exit the Main Console.
- Can monitor connection conditions, such as Account, log in time, flow rate, and IP address. Includes remote control information for analyzing data and sorting out responsibilities.
- Log data: Unusual event, system log, counting application can export to "xls" or "txt" file.
- Execute recording, smart guard, and other functions in the background after logging out of the system.
- Supports 22 languages: English, Tranditional Chinese, Simplified Chinese, Japanese, Franch, Spanish, German, Italian, Turkish, Danish, Hungarian, Greece, Finnish, Russian, Thai, Czech, Slovak, Korean, Portuguese, Portuguese (Brazil), Hebrew, Persian

System Requirements

Total FPS at CIF	600 or more	480 to 600	240 to 480	120 to 240	less than 120
CPU	Intel Core 2 Duo QX6700	Intel Core 2 Duo E6400	Intel Pentium D 930	Intel P4 2.8 GHz	Intel P4 2.4 GHz
RAM	2 GB	1 GB	1 GB	512 MB	512 MB
Motherboard	Intel 945 or 965 chip, Intel chipset recommended				
Display	ATI Radeon 9200, nVIDIA GeForce FX-5200, Intel 945 / 965, or above (ATI recommended)				
Ethernet	100BaseT(X) or above, Gigabit LAN recommended				
Hard Disk	80 GB or above				
OS	MS Windows 2000/XP Pro SP2/2003				

Ordering Information

Available Models

SoftNVR-4: SoftNVR with 4-channel license Key Pro
SoftNVR-8: SoftNVR with 8-channel license Key Pro
SoftNVR-16: SoftNVR with 16-channel license Key Pro
SoftNVR-25: SoftNVR with 25-channel license Key Pro
SoftNVR-32: SoftNVR with 32-channel license Key Pro
SoftNVR-64: SoftNVR with 64-channel license Key Pro

Package Checklist

SoftNVR CD: Includes the SoftNVR software and related documents
Key Pro: Plugs into the USB port
Printed Manual: Moxa SoftNVR Quick Installation Guide

SoftDVR™ Pro

Easy-to-use 16-channel IP surveillance software

Moxa's SoftDVR™ Pro IP surveillance software is designed for video-over-IP surveillance systems that use Moxa's VPort series of video servers as their distributed video networking solution. With the help of Moxa SoftDVR™, system integrators can seamlessly integrate other applications, such as I/O sensors and alarms, with CCTV systems over an IP-based network.

Introduction

Viewing and Playback—Anywhere, Anytime

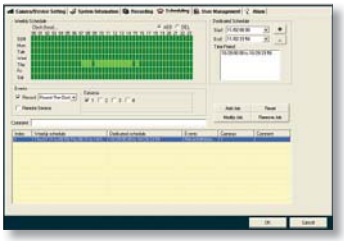
- Remote access from popular web browsers
- Supports 1, 4, 6, 8, 9, 10, 13, 16 camera viewing formats
- Maximum of 16 cameras in a system
- Synchronized video/audio viewing and recording (for VPort MPEG4 video servers)
- Historical playback by time and event
- Zoom-in/Zoom-out function for individual cameras when playing back images
- Take snapshots in playback mode to get JPEG images for printing or to save as evidence
- Can adjust the contrast, brightness, sharpness, blur, and grayscale of the snapshot image

Record and Store over the Network

- Recording action can be triggered in round-the-clock mode or event mode of VMD (Video Motion Detection) and DI
- Record video in AVI format—compatible with popular media players
- Dynamically adjust recording frame rate over the LAN/Internet to match the real frame transmit speed, to keep the video synchronized with the actual time
- Recorded video format can be selected as adjustable FPS MJPEG, or MPEG4 standard, for VPort MJPEG video servers
- Recyclable override of hard disk space in FIFO (First-In-First-Out) sequence
- Recorded video files can be stored on a local PC or Windows-based networked storage server

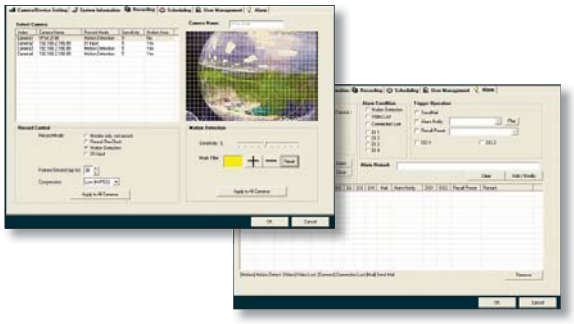
Schedule Jobs for Recording and Remote Service

- Administrators can set up the time schedule of remote service and the recording action for each camera



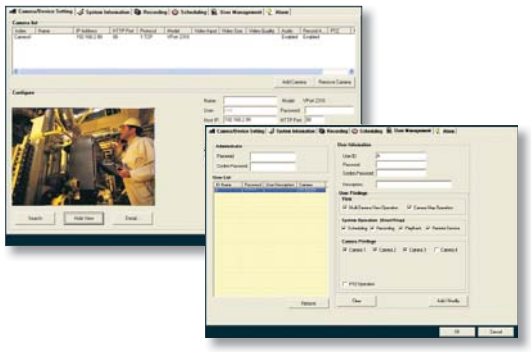
Trigger and Send Alarm Messages

- Area-selectable Video Motion Detection (VMD) function for each camera
- Sensitivity tuning for the VMD
- Alarm can be triggered by VMD, video lost, communication failure, storage failure, storage full, DIs, and then sent by email, or trigger relays (DOs), sound, or a PTZ camera to a preset position



Video Server Configuration and System Management

- Can configure each camera's name, video quality, and video resolution separately
- Supports PTZ camera controls (same as VPort series video servers' support list)
- Supports Moxa's VPort series of video servers
- Up to 32 users can be added to one system
- Supports remote VPort's firmware upgrade
- Can set up the camera view and system operation for each user
- Automatically resume viewing and recording after system reboot
- Cameras can be managed easily with your own e-map



System Requirements

Operating System: MS Windows XP

SDRAM: 1 GB or more

DirectX: 9.0C or above

Intel Dual Core: 2.0 GHz or more

Nvidia GeForce or ATI TNT2 Graphics Card: At least 64 MB of display memory required

Ordering Information

Available Models

SoftDVR™ Pro: 16-channel IP surveillance software for viewing and recording

Package Checklist

SoftDVR™ Pro CD: Includes the SoftDVR™ Pro software, SQL database software, and user's manual

Key Pro: Plugs into the USB port

Printed Manual: Moxa SoftDVR™ Pro Quick Installation Guide

SoftDVR™ Lite Bundled FREE with VPort Series Video Servers

- 1 to 4-ch (Quad) viewing format; max. 4 cameras
- Supports viewing and recording on local PCs
- Full image VMD with sensitivity tuning
- Schedule jobs for recording
- System requirements:
  - MS Windows XP
  - 512 MB SDRAM or above
  - Nvidia GeForce or ATI TNT2 graphics card with 32 MB display memory or above
  - Intel Pentium 4 , 2.4 GHz HT (Hyper-Threading) or above
  - DirectX 9.0C or above

VPort SDK PLUS

User-friendly software development kits for third-party developers to customize video-over-IP management systems

Introduction

Moxa IVN (Industrial Video Networking) solutions, which include VPort series video servers and SoftDVR™ IP surveillance software, are future-proof, ready-to-use video-over-IP solutions for video surveillance applications. With the growing popularity of IP networks, more and more users need to integrate their video management system with other monitoring and control systems (e.g., SCADA or HMI) to get the benefits of centralization and inter-operation. To assist third-party developers with this intergration,we are providing Moxa VPort SDK PLUS, which supports VPort 25/251/254/351/354 and future products, for building customized video management systems and for integrating VPort series products into comprehensive monitoring and control systems.

URL Commands

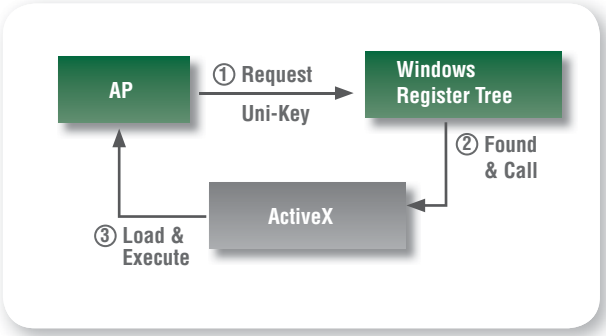
URL commands are easy-to-use CGI commands used with HTML programming for web systems. Users can acquire video images and control VPort series products from their own customized web pages by embedding these CGI commands into the HTML source code. All of the URL commands are listed in the VPort user's manual, or a CGI command manual.

ActiveX Control SDK PLUS

Sample code available

ActiveX Control is an OCX component that uses Microsoft COM (Component Object Model) technology to enable software components to communicate. ActiveX Control is used widely with platforms that support WIN32, IE Plug-in, and Visual Basic, and is also popular in automation system software, such as SCADA. Moxa ActiveX Control SDK PLUS is a user-friendly, customized tool for programmers that supports versatile parameters for customized viewing, recording, PTZ camera control, event triggering, and recorded video playback. Moxa ActiveX Control SDK PLUS is provided free of charge, and supports VB, VC, and C# developing environments, as well as plug-ins for web applications and automation tools (e.g., SCADA software). Third-party developers who want to use ActiveX SDK can download it from Moxa's website.

ActiveX Work Process

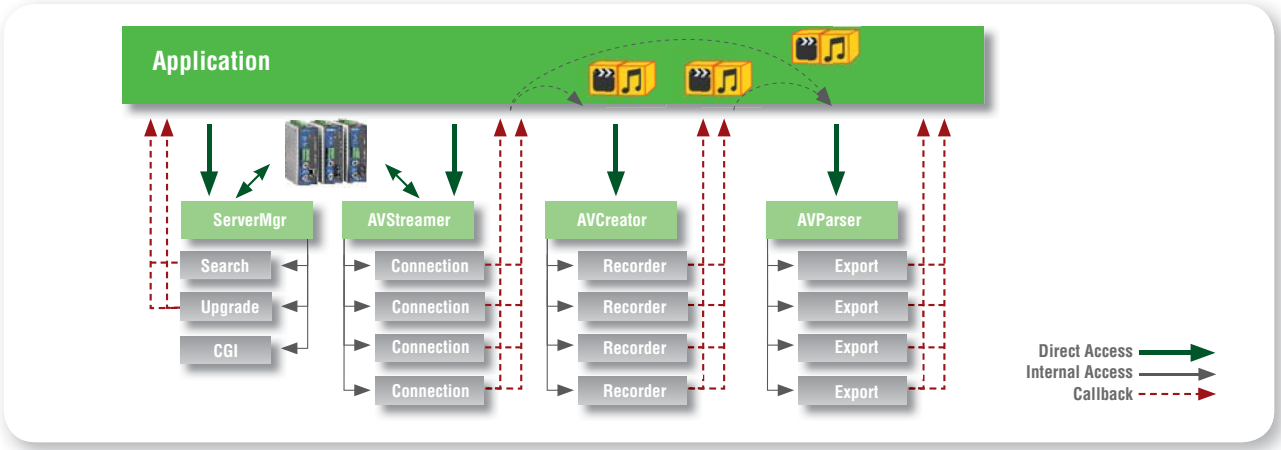


API SDK PLUS

Sample code available

For some video management applications, ActiveX Control SDK PLUS may not provide users with enough functionality. In this case, API SDK PLUS, which includes a detailed C library, can be used to program customized solutions in a Visual C++ or C# environment. API SDK PLUS includes a total of 4 DLL modules, and currently supports the WIN32, Linux, and WIN CE pocket 2003 platforms. API SDK PLUS is provided free of charge. However, since API SDK PLUS uses proprietary technology and the programmer must be an experienced, professional C programmer, we are not releasing API SDK PLUS for general use. Third-party developers who would like to use API SDK PLUS should request support on Moxa's website to apply for a free copy. Some verification is required.

API Module Structure



Terminal Servers

Product Selection Guides

NPort® 6000 Terminal Servers 7-2

CN2600 Terminal Servers 7-4

Terminal Servers

Secure Terminal Servers 7-6

NPort® 6150 1-port RS-232/422/485 secure terminal server. 7-10

NPort® 6250 Series 2-port RS-232/422/485 secure terminal servers. 7-12

NPort® 6450 4-port RS-232/422/485 secure terminal server. 7-14

NPort® 6600 Series 8/16/32-portRS-232/422/485 rackmount terminal servers. 7-17

NM-GPRS/GSM Module 4-port cellular NM-GPRS/GSM module 7-20

NM-Modem Module PSTN modem network module. 7-22

CN2600 Series 8/16-port RS-232/422/485 terminal servers with LAN redundancy. . . . 7-24

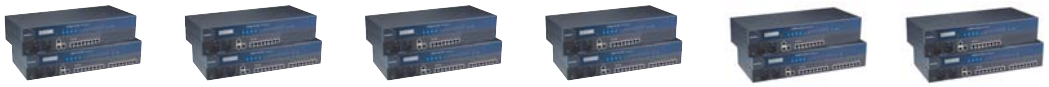
NPort® 6000 Terminal Servers

	NPort® 6150	NPort® 6250	NPort® 6250-M-SC	NPort® 6250-S-SC	NPort® 6450	NPort® 6610-8	NPort® 6610-8-48V	NPort® 6610-16	NPort® 6610-16-48V
LAN Interface									
10/100BaseT(X) Ports	1 port (8-pin RJ45 connector)								
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
100BaseFX Ports	---	---	1 (multi-mode)	1 (single-mode)	---	---	---	---	---
Expansion Modules									
10/100BaseT(X) (RJ45)	---	---	---	---	√	√	√	√	√
Multi-mode Fiber (SC)	---	---	---	---	√	√	√	√	√
Single-mode Fiber (SC)	---	---	---	---	√	√	√	√	√
GSM/GPRS	---	---	---	---	√	√	√	√	√
Modem	---	---	---	---	√	√	√	√	√
Serial Interface									
RS-232 Ports	---	---	---	---	---	8	8	16	16
RS-232/422/485 Ports	1	2	2	2	4	---	---	---	---
Connectors	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	RTS/CTS, DTR/DSR, XON/XOFF								
Baudrate	50 bps to 921.6 Kbps (supports non-standard baudrates)								
15 KV ESD Protection	√	√	√	√	√	√	√	√	√
2 KV isolation protection	---	---	---	---	---	---	---	---	---
RS-485 Data Direction Control	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®
RS-232 Console Port	√	√	√	√	√	√	√	√	√
Advanced Features									
LCD Panel with 4 push buttons	---	---	---	---	√	√	√	√	√
Serial Data Log	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB
Offline Port Buffering	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB
SD Slot	---	√	√	√	√	√	√	√	√
Software									
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, DDNS, HTTP, SMTP, HTTPS, SSL, SSH, PPPoE, RFC2217, IPv6, IPv4, Turbo Ring, Turbo Ring 2								
Security Protocols	DES, 3DES, AES, SSH, SSL, HTTPS, RADIUS, PAP, CHAP, TACACS+								
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Search Utility								
Driver Support	Windows Driver Manager (for Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded), Linux Real TTY driver (for 2.4.x, 2.6.x), Fixed TTY driver (for SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i)								
Management	SNMP MIB-II								
IP Routing	Static, RIP-I, RIP-II								
Standard Operation Modes	Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled								
Secure Operation Modes	Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH								
Terminal Sessions	8 sessions per port								
Physical Characteristics									
Housing	Metal	Metal	Metal	Metal	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	700 g	730 g	730 g	730 g	1020 g	3460 g	3460 g	3580 g	3580 g
Dimensions (mm)	67 x 100.4 x 28	77 x 111 x 28	77 x 111 x 28	77 x 111 x 28	158 x 103 x 35	440 x 195 x 44	440 x 195 x 44	440 x 195 x 44	440 x 195 x 44
Environmental Limits									
Operating Temperature	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C
Power Requirements									
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	100 to 240 VAC	±48 VDC	100 to 240 VAC	±48 VDC
Power Consumption	285 mA @ 12 V 150 mA @ 24 V	333 mA @ 12 V 173 mA @ 24 V	428 mA @ 12 V 219 mA @ 24 V	376 mA @ 12 V 193 mA @ 24 V	730 mA @ 12 V 330 mA @ 24 V	285 mA @ 100 V 190 mA @ 240 V	293 mA @ 48 V	285 mA @ 100 V 190 mA @ 240 V	293 mA @ 48 V
Regulatory Approvals									
EMC	CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A								
Safety	UL (UL60950-1), TÜV (EN60950-1)								
EMS	EN61000-4-2 (ESD), Level 3 EN61000-4-4 (EFT), Level 2 EN61000-4-5 (Surge), Level 2					EN61000-4-2 (ESD), Level 3 EN61000-4-4 (EFT), Level 2 EN61000-4-5 (Surge), Level 3			
Reliability									
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√	√
MTBF	231709 hrs	226128 hrs	225762 hrs	225762 hrs	120354 hrs	135891 hrs	135891 hrs	102373 hrs	102373 hrs
Warranty	5 years (see www.moxa.com/warranty)								

NPort® 6000 Terminal Servers

	NPort® 6610-32	NPort® 6610-32-48V	NPort® 6650-8	NPort® 6650-8-48V	NPort® 6650-16	NPort® 6650-16-48V	NPort® 6650-32	NPort® 6650-32-48V
LAN Interface								
10/100BaseT(X) Ports	1 port (8-pin RJ45 connector)							
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
100BaseFX Ports	---	---	---	---	---	---	---	---
Expansion Modules								
10/100BaseT(X) (RJ45)	√	√	√	√	√	√	√	√
Multi-mode Fiber (SC)	√	√	√	√	√	√	√	√
Single-mode Fiber (SC)	√	√	√	√	√	√	√	√
GSM/GPRS	√	√	√	√	√	√	√	√
Modem	√	√	√	√	√	√	√	√
Serial Interface								
RS-232 Ports	32	32	---	---	---	---	---	---
RS-232/422/485 Ports	---	---	8	8	16	16	32	32
Connectors	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark							
Flow Control	RTS/CTS, DTR/DSR, XON/XOFF							
Baudrate	50 bps to 921.6 Kbps (supports non-standard baudrates)							
15 KV ESD Protection	√	√	√	√	√	√	√	√
2 KV isolation protection	---	---	---	---	---	---	---	---
RS-485 Data Direction Control	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®
RS-232 Console Port	√	√	√	√	√	√	√	√
Advanced Features								
LCD Panel with 4 push buttons	√	√	√	√	√	√	√	√
Serial Data Log	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB
Offline Port Buffering	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB
SD Slot	√	√	√	√	√	√	√	√
Software								
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, DDNS, HTTP, SMTP, HTTPS, SSL, SSH, PPPoE, RFC2217, IPv6, IPv4, Turbo Ring, Turbo Ring 2							
Security Protocols	DES, 3DES, AES, SSH, SSL, HTTPS, RADIUS, PAP, CHAP, TACACS+							
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Search Utility							
Driver Support	Windows Driver Manager (for Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded), Linux Real TTY driver (for 2.4.x, 2.6.x), Fixed TTY driver (for SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, \AIX 5.x, HP-UX 11i)							
Management	SNMP MIB-II							
IP Routing	Static, RIP-I, RIP-II							
Standard Operation Modes	Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled							
Secure Operation Modes	Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH							
Terminal Sessions	8 sessions per port							
Physical Characteristics								
Housing	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	3600 g	3600 g	3460 g	3460 g	3580 g	3580 g	3600 g	3600 g
Dimensions (mm)	440 x 195 x 44	440 x 195 x 44	440 x 195 x 44	440 x 195 x 44	440 x 195 x 44	440 x 195 x 44	440 x 195 x 44	440 x 195 x 44
Environmental Limits								
Operating Temperature	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C
Power Requirements								
Input Voltage	100 to 240 VAC	±48 VDC	100 to 240 VAC	±48 VDC	100 to 240 VAC	±48 VDC	100 to 240 VAC	±48 VDC
Power Consumption	285 mA @ 100 V 190 mA @ 240 V	293 mA @ 48 V	285 mA @ 100 V 190 mA @ 240 V	293 mA @ 48 V	285 mA @ 100 V 190 mA @ 240 V	293 mA @ 48 V	285 mA @ 100 V 190 mA @ 240 V	293 mA @ 48 V
Regulatory Approvals								
EMC	CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A							
Safety	UL (UL60950-1), TÜV (EN60950-1)							
EMS	EN61000-4-2 (ESD), Level 3 EN61000-4-4 (EFT), Level 2 EN61000-4-5 (Surge), Level 2							
Reliability								
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√
MTBF	68707 hrs	68707 hrs	135370 hrs	135370 hrs	101783 hrs	101783 hrs	68177 hrs	68177 hrs
Warranty	5 years (see www.moxa.com/warranty)							

CN2600 Terminal Servers



	CN2610-8	CN2610-16	CN2610-8-2AC	CN2610-16-2AC	CN2650-8	CN2650-16
LAN Interface						
10/100BaseT(X) Ports	2 ports (8-pin RJ45 connector)					
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface						
RS-232 Ports	8	16	8	16	---	---
RS-232/422/485 Ports	---	---	---	---	8	16
Connectors	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control	RTS/CTS, DTR/DSR, XON/XOFF					
Baudrate	50 bps to 921.6 Kbps					
15 KV ESD Protection	√	√	√	√	√	√
2 KV isolation protection	---	---	---	---	---	---
RS-485 Data Direction Control	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®
RS-232 Console Port	√	√	√	√	√	√
Advanced Features						
LCD Panel with 4 push buttons	√	√	√	√	√	√
Serial Data Log	128 KB	128 KB	128 KB	128 KB	128 KB	128 KB
Offline Port Buffering	128 KB	128 KB	128 KB	128 KB	128 KB	128 KB
Software						
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE, DDNS					
Security Protocols	RADIUS, https, SSH, PAP, CHAP					
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Search Utility					
Driver Support	Windows Driver Manager (for Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded), Linux Real TTY driver (for 2.4.x, 2.6.x), Fixed TTY driver (for SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i)					
Management	SNMP MIB-II					
IP Routing	Static, RIP-I, RIP-II					
Standard Operation Modes	Real COM, TCP Server, TCP Client, UDP, RFC2217, Terminal, Reverse Telnet, PPP, DRDAS, Redundant COM, Disabled					
Terminal Sessions	8 sessions per port					
Physical Characteristics						
Housing	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	3525 g	3560 g	3760 g	3980 g	3740 g	3790 g
Dimensions (mm)	440 x 198 x 45	440 x 198 x 45	440 x 198 x 45	440 x 198 x 45	440 x 198 x 45	440 x 198 x 45
Environmental Limits						
Operating Temperature	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C
Power Requirements						
Number of Inputs	1	1	2	2	1	1
Input Voltage	100 to 240 VAC, 47 to 63 Hz					
Power Consumption	235 mA @ 100 VAC, 145 mA @ 240 V					
Regulatory Approvals						
EMC	CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A					
Safety	UL (UL60950), TÜV (EN60950)					
EMS	EN61000-4-2 (ESD), Level 3 EN61000-4-4 (EFT), Level 4 EN61000-4-5 (Surge), Level 2					
Reliability						
Buzzer, RTC, WDT	√	√	√	√	√	√
MTBF	99302 hrs					
Warranty	5 years (see www.moxa.com/warranty)					

CN2600 Terminal Servers

	CN2650-8-2AC	CN2650-16-2AC	CN2650I-8	CN2650I-16	CN2650I-8-2AC	CN2650I-16-2AC
LAN Interface						
10/100BaseT(X) Ports	2 ports (8-pin RJ45 connector)					
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface						
RS-232 Ports	---	---	---	---	---	---
RS-232/422/485 Ports	8	16	8	16	8	16
Connectors	8-pin RJ45	8-pin RJ45	DB9 male	DB9 male	DB9 male	DB9 male
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control	RTS/CTS, DTR/DSR, XON/XOFF					
Baudrate	50 bps to 921.6 Kbps					
15 KV ESD Protection	√	√	√	√	√	√
2 KV isolation protection	---	---	√	√	√	√
RS-485 Data Direction Control	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®
RS-232 Console Port	√	√	√	√	√	√
Advanced Features						
LCD Panel with 4 push buttons	√	√	√	√	√	√
Serial Data Log	128 KB	128 KB	128 KB	128 KB	128 KB	128 KB
Offline Port Buffering	128 KB	128 KB	128 KB	128 KB	128 KB	128 KB
Software						
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE, DDNS					
Security Protocols	RADIUS, https, SSH, PAP, CHAP					
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Search Utility					
Driver Support	Windows Driver Manager (for Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded), Linux Real TTY driver (for 2.4.x, 2.6.x), Fixed TTY driver (for SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i)					
Management	SNMP MIB-II					
IP Routing	Static, RIP-I, RIP-II					
Standard Operation Modes	Real COM, TCP Server, TCP Client, UDP, RFC2217, Terminal, Reverse Telnet, PPP, DRDAS, Redundant COM, Disabled					
Terminal Sessions	8 sessions per port					
Physical Characteristics						
Housing	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	3900 g	3980 g	3666 g	3776 g	3932 g	4022 g
Dimensions (mm)	440 x 198 x 45	440 x 198 x 45	440 x 198 x 45	440 x 198 x 45	440 x 198 x 45	440 x 198 x 45
Environmental Limits						
Operating Temperature	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C
Power Requirements						
Number of Inputs	2	2	1	1	2	2
Input Voltage	100 to 240 VAC, 47 to 63 Hz					
Power Consumption	235 mA @ 100 VAC, 145 mA @ 240 VAC					
Regulatory Approvals						
EMC	CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A					
Safety	UL (UL60950), TÜV (EN60950)					
EMS	EN61000-4-2 (ESD), Level 3 EN61000-4-4 (EFT), Level 4 EN61000-4-5 (Surge), Level 2					
Reliability						
Buzzer, RTC, WDT	√	√	√	√	√	√
MTBF	99302 hrs					
Warranty	5 years (see www.moxa.com/warranty)					

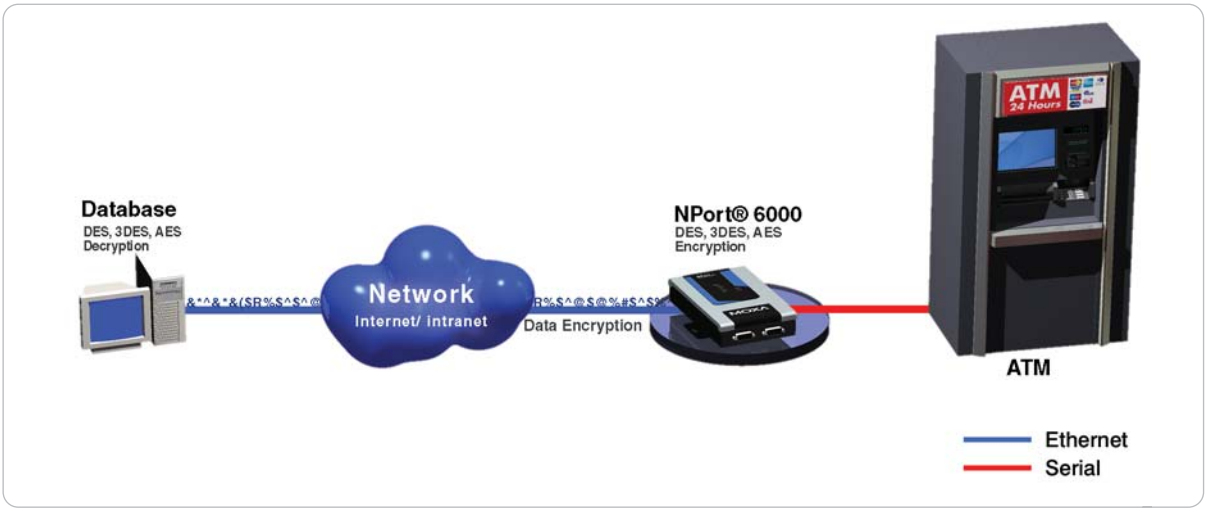
Secure Terminal Servers

NPort® 6000 secure terminal servers provide serial-to-Ethernet connectivity that is both reliable and secure. They can be used to connect any serial device to an Ethernet network using a variety of operation modes—Real COM, TCP Server, TCP Client, UDP, RFC2217, Pair Connection, Ethernet Modem, Terminal, Reverse Terminal, Printer, and Dial in/out. For applications that require data security, such as banking, telecom, access control, and remote site management, secure modes are also available—Secure TCP Server, Secure TCP Client, Secure Pair-Connection, Secure Real COM, and Secure Terminal modes.

Safe Data Communication

Secure Data Communication with SSL

Network security is a critical issue for certain applications, and is especially important when data is transmitted over the Internet where it is vulnerable to interception by third parties. The NPort® 6000 secure terminal servers use SSL to implement secure data transmission for Secure TCP Server, Secure TCP Client, Secure Pair Connection, and Secure Real COM modes. The NPort®'s drivers follow the SSL standard and automatically negotiate the encryption key, and to prevent hacker attacks, the NPort® will automatically switch from DES/3DES to AES encryption.



Secure Remote Management and Configuration with SSH and SSL

Unauthorized access is a major concern for system managers, and the NPort® 6000 secure terminal servers help control access by supporting IP filtering and password protection. Extra protection from hackers is also provided by SSH and SSL. Secure configuration of the NPort® 6000 is provided by opening the web console with a web browser that supports https (e.g., Internet Explorer), or by opening the Telnet console using a terminal emulator that supports SSH (e.g., PuTTY).

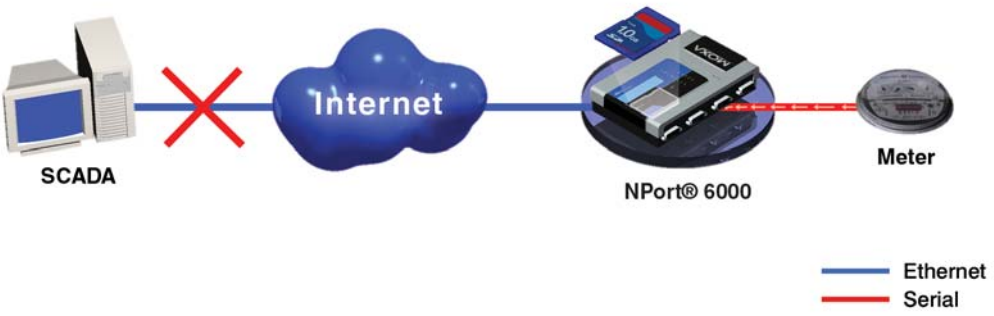
Powerful Hardware Encryption Engine

A powerful hardware encryption engine that supports the complete DES/3DES/AES encryption algorithms is built into the NPort® 6000. For DES and 3DES encryption, the NPort® 6000 supports ECB, CBC, CFB, and OFB modes. For AES encryption, the NPort® 6000 supports ECB, CBC, CFB, OFB, and CTR modes with a 128-bit, 192-bit, or 256-bit key.

Reliable Data Communication

Port Buffering that Preserves Data if the Ethernet Fails

For mission-critical applications, data collected from a serial device must be safeguarded in case the Ethernet network gets disconnected. The NPort® 6000 provides exceptionally reliable data transmission by saving serial data to an internal 64 KB port buffer if the Ethernet connection fails. When the Ethernet network is reconnected, data in the buffer is automatically released and sent to the appropriate destination. For the NPort® 6250, 6450, and 6650, this buffer can be expanded by installing an SD card.



Ethernet Port Expansion (NPort® 6450/6600 only)

Although more and more devices are now Ethernet-ready, many legacy devices only provide a serial interface. The main purpose of a device server is to connect serial devices to an Ethernet network, allowing engineers to integrate all devices into an Ethernet environment. A problem can arise if both Ethernet-ready and legacy serial devices need to be connected from the same location. The NPort® 6000 can use the Ethernet expansion module to add additional Ethernet ports, effectively allowing operation as a combination Ethernet switch/device server. By using the NPort® 6000's Ethernet expansion modules, users no longer need to invest in a more expensive switch or hub to connect every device. Modules are available for different Ethernet media, including copper Ethernet, multi-mode fiber, and single-mode fiber. Ethernet expansion modules can also be used to create a cascading topology in which device servers are connected to each other in a daisy chain arrangement.

Interchangeable modules for Ethernet expansion

1 RJ45 Ethernet Port

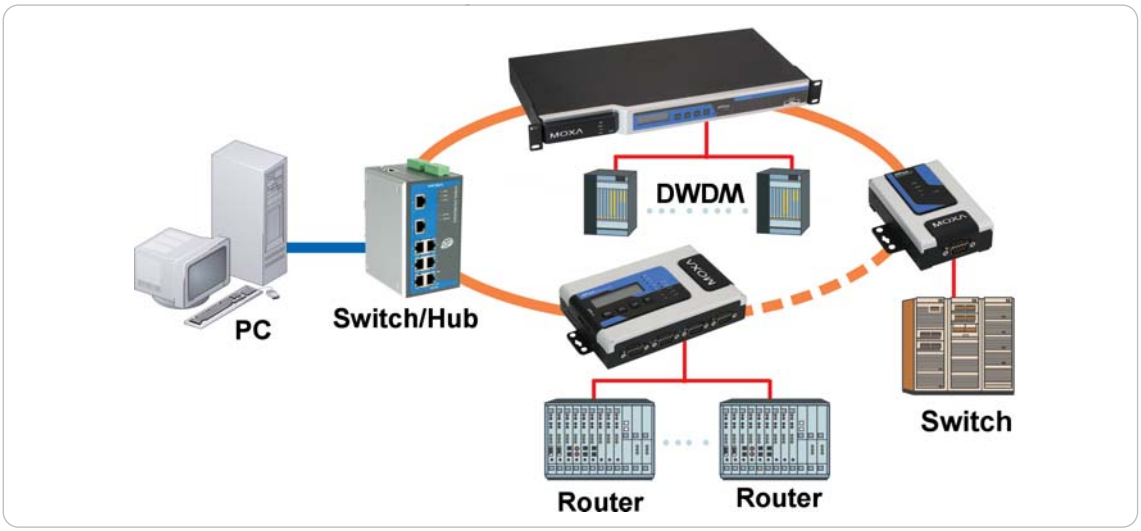
1 fiber Ethernet port (single or multi mode)

2 fiber Ethernet ports (single or multi mode)

2 RJ45 Ethernet Port

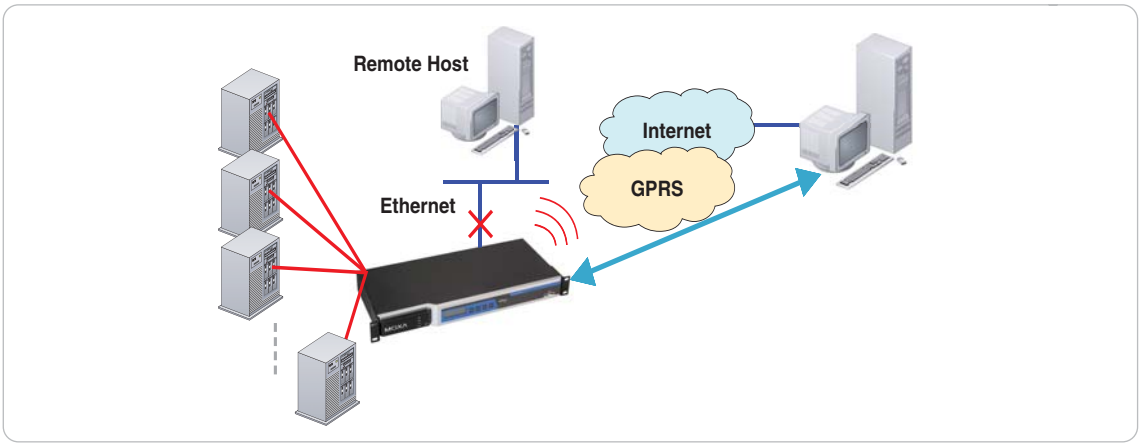
Ethernet Ring Topology with Fast Recovery

NPort® 6000 secure terminal servers support the Turbo Ring protocol for cascade topologies. With Turbo Ring, if any segment of the daisy-chain ring is disconnected, the network will recover in less than 300 ms.



Redundant Ethernet (NPort® 6450/6600 only)

The NM-GPRS/GSM and NM-Modem network modules can be used to provide NPort® 6000 secure terminal servers with an automatic backup capability. When the backup function is enabled, the NPort® 6000 will check the remote host connection on the Ethernet side after powering on. Once a connection failure has occurred, data from the serial device will be sent out through the GSM/GPRS and PSTN network. When the remote host on the Ethernet side returns to normal status, data will again be sent through the Ethernet connection. The NPort® 6000 backup function makes data transmission safer and more reliable.



Flexible and Easy to Use Design

Supports ADSL Dial-up and DDNS

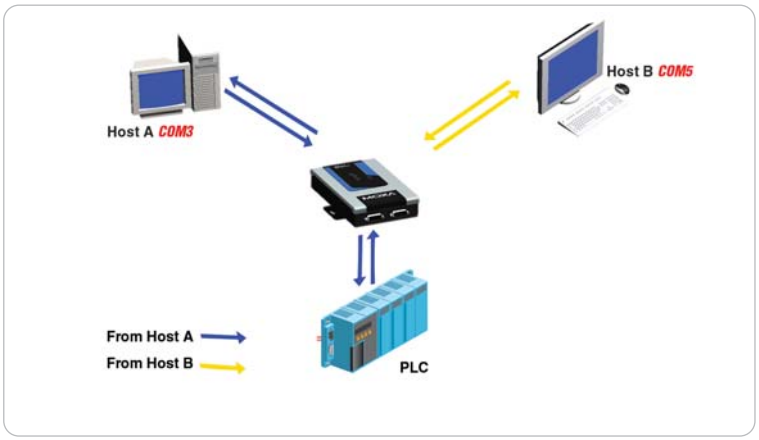
When serial devices are connected to an NPort® 6000 secure terminal server, any networked computer can be used to control the devices over an Ethernet network, intranet, or the Internet. Connections can be established using different operation modes, such as Real COM/TTY, TCP Server, and TCP Client. The NPort® 6000 also supports PPPoE for ADSL connections, and DDNS can be used to help locate NPort® 6000 secure terminal servers on the network. In addition, fiber optic models are available to extend the Ethernet connection distance.

Select Non-standard Baudrates between 50 bps and 921.6 Kbps

Engineers who use serial devices know that most device servers only support “standard” baudrates. However, some applications require special baudrates, such as 250 Kbps or 500 Kbps. One of the advantages of the NPort® 6000 device servers is that you can select any baudrate between 50 bps and 921.6 Kbps, allowing the NPort® 6000 to be used with serial devices that require special baudrates (the actual baudrate will be within 3% of the selected value; see the user’s manual for details).

"Command by Command" Mode

For applications that require multiple hosts to communicate with one serial device, it is often necessary to require the NPort® to issue one command at a time. What this means is that after the NPort® issues a command, it waits for the next request before issuing another command. In other words, the NPort® issues a command, waits for a request, issues a command, waits for a request, and so on. The "command by command" mode is designed specifically for this kind of multi-host application. With command by command mode, after issuing each command, the NPort® 6000 waits for a response before sending out the next command.

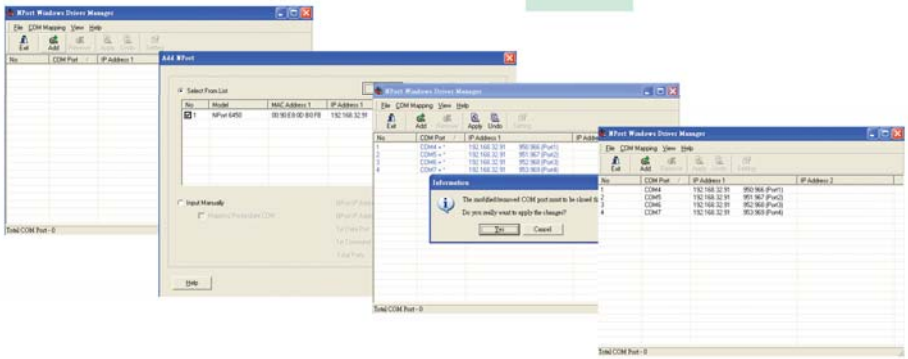


Two Powerful Utilities

The NPort® Search Utility and NPort® Windows Driver Manager make it easy for users to build a new system. After connecting the NPort® 6000 to your computer, or to a local network, use the NPort® Search Utility to search and load web console settings. After that, the NPort® Windows Driver Manager can be used to and map NPort® 6000 serial ports to Windows COM ports.

NPort® Search Utility

NPort® Windows Driver Manager



NPort® 6150

1-port RS-232/422/485 secure terminal server

- Simple solution for connecting serial devices to a network
- Secure operation modes for Real COM, TCP Server, TCP Client, Pair Connection, Terminal, and Reverse Terminal
- Non-standard baudrates supported with high precision
- Automatic RS-485 data direction control with Moxa's patented ADDC®
- Enhanced remote configuration with HTTPS and SSH
- Port buffers for storing serial data when the Ethernet is off-line
- Supports IPv6

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The NPort® 6150 is a 1-port device server that uses the SSL and SSH protocols to transmit encrypted serial data over Ethernet. The NPort® 6150's 3-in-1 serial port supports RS-232, RS-422, and RS-485, with the interface selected from an easy-to-access configuration menu.

Secure Data Transmission

For many applications, guaranteeing secure data transmission is an important concern when connecting serial devices to a network. In answer to this concern, the NPort® 6150 supports the SSL and SSH protocols, which work by encrypting data before sending it over the network. With the NPort® 6150, users can rest assured that serial data is transmitted securely over both private and public networks.

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation: 1.5 KV built-in

Serial Interface

Number of Ports: 1
Serial Standards: RS-232/422/485
Connector: DB9 male
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Serial Line Protection: 15 KV ESD protection for all signals
Console Port: Serial port doubles as RS-232 console port

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, XON/XOFF
Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates)
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE, DDNS
Security Protocols: DES, 3DES, AES, SSH, SSL, HTTPS, RADIUS, PAP, CHAP, TACACS+
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Search Utility
Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i
Linux Real TTY Drivers: 2.4.x, 2.6.x
Management: SNMP MIB-II
IP Routing: Static, RIP-I, RIP-II

Operation Modes

Standard: Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled

Secure: Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH

Terminal Sessions: 8 sessions per port

Physical Characteristics

Housing: Metal

Weight: 700 g

Dimensions:
Without ears: 67 x 100.4 x 28 mm (2.64 x 3.95 x 1.1 in)
With ears: 90 x 100.4 x 28 mm (3.54 x 3.95 x 1.1 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-4 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 285 mA @ 12 V, 150 mA @ 24 V

Power Line Protection: 1 KV burst (EN61000-4-4: EFT/B), 0.5 KV surge (EN61000-4-5)

Regulatory Approvals

EMC: CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A

Safety: UL (UL60950-1), TÜV (EN60950-1)

EN61000-4-2 (ESD): Level 3

EN61000-4-4 (EFT): Level 2

EN61000-4-5 (Surge): Level 2

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

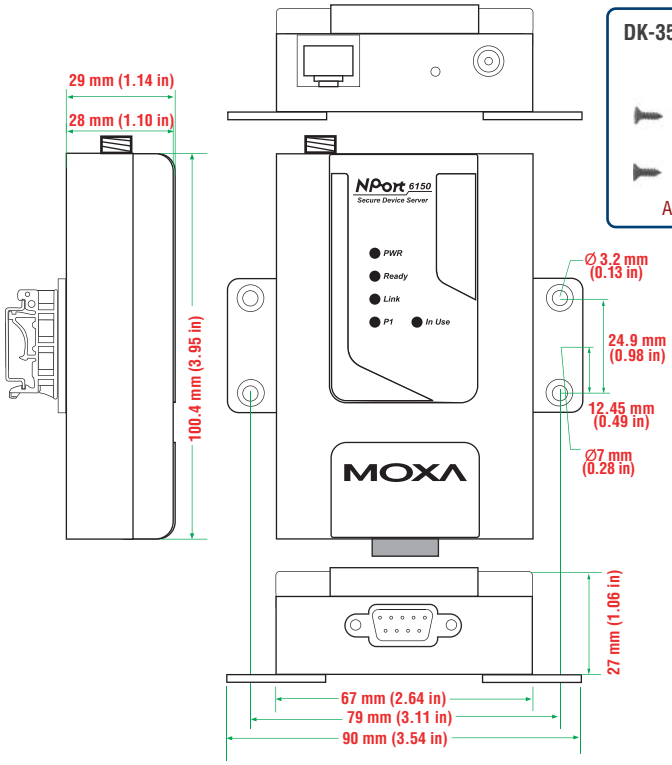
MTBF (meantime between failures): 231709 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions

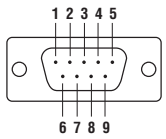


DK-35A DIN-Rail Kit

Available Accessory

Pin Assignment

DB9 male connector



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Ordering Information

Available Models

NPort 6150: 1-port RS-232/422/485 secure device server

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail

NP21101: DB25 male to DB9 female RS-232 cable, 30 cm

Package Checklist

- NPort® 6150 device server
- Power Adaptor
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

NPort® 6250 Series

2-port RS-232/422/485 secure terminal servers

- Simple solution for connecting serial devices to a network
- Secure operation modes for Real COM, TCP Server, TCP Client, Pair Connection, Terminal, and Reverse Terminal
- Non-standard baudrates supported with high precision
- Choice of network medium: 10/100BaseTX or 100BaseFX
- Enhanced remote configuration with HTTPS and SSH
- Port buffers for storing serial data when the Ethernet is off-line
- Supports IPv6

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The 2-port NPort® 6250 device servers use the SSL and SSH protocols to transmit encrypted serial data over Ethernet. Models are available for connecting to a 10/100BaseTX copper Ethernet or 100BaseTX fiber network. Both single-mode and multi-mode fiber are supported.

No Data Loss if Ethernet Connection Fails

The NPort® 6250 device servers help guarantee reliability by providing users with secure serial-to-Ethernet data transmission and a customer-oriented hardware design. If the Ethernet connection fails, the NPort® 6250 will queue all serial data in its internal 64 KB port buffer. When the Ethernet connection is re-established, the NPort® 6250 will immediately release all data in the buffer in the order that it was received. Users can increase the port buffer size by installing an SD card.

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation: 1.5 KV built-in

Optical Fiber Interface (NPort 6250-S-SC/6250-M-SC)

Fiber Port: 100BaseFX, SC connector
Distance:
Multi-mode: 0 to 2 km, 1310 nm (62.5/125 µm, 500 MHz*km)
Single mode: 0 to 40 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))
Min. TX Output:
Multi-mode: -20 dBm
Single-mode: -5 dBm
Max. TX Output:
Multi-mode: -14 dBm
Single-mode: 0 dBm
Sensitivity:
Multi-mode: -34 to -30 dBm
Single-mode: -36 to -32 dBm

Serial Interface

Number of Ports: 2
Serial Standards: RS-232/422/485
Connector: DB9 male
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Serial Line Protection: 15 KV ESD protection for all signals
Console Port: Serial port 1 doubles as RS-232 console port

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, XON/XOFF
Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates)
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Memory Expansion Slot

Slot Type: SD socket (supports up to 1 GB)

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE, DDNS
Security Protocols: DES, 3DES, AES, SSH, SSL, HTTPS, RADIUS, PAP, CHAP, TACACS+
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Search Utility
Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: 2.4.x, 2.6.x

Management: SNMP MIB-II

IP Routing: Static, RIP-I, RIP-II

Operation Modes

Standard: Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled

Secure: Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH

Terminal Sessions: 8 sessions per port

Physical Characteristics

Housing: Metal

Weight: 730 g

Dimensions:
Without ears: 77 x 111 x 28 mm (3.30 x 4.37 x 1.1 in)
With ears: 89 x 111 x 28 mm (3.50 x 4.37 x 1.1 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-4 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
NPort 6250: 333 mA @ 12 V, 173 mA @ 24 V
NPort 6250-M-SC: 428 mA @ 12 V, 219 mA @ 24 V
NPort 6250-S-SC: 376 mA @ 12 V, 193 mA @ 24 V

Power Line Protection: 1 KV burst (EN61000-4-4: EFT/B), 0.5 KV surge (EN61000-4-5)

Regulatory Approvals

EMC: CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A

Safety: UL (UL60950-1), TÜV (EN60950-1)

EN61000-4-2 (ESD): Level 3

EN61000-4-4 (EFT): Level 2

EN61000-4-5 (Surge): Level 2

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

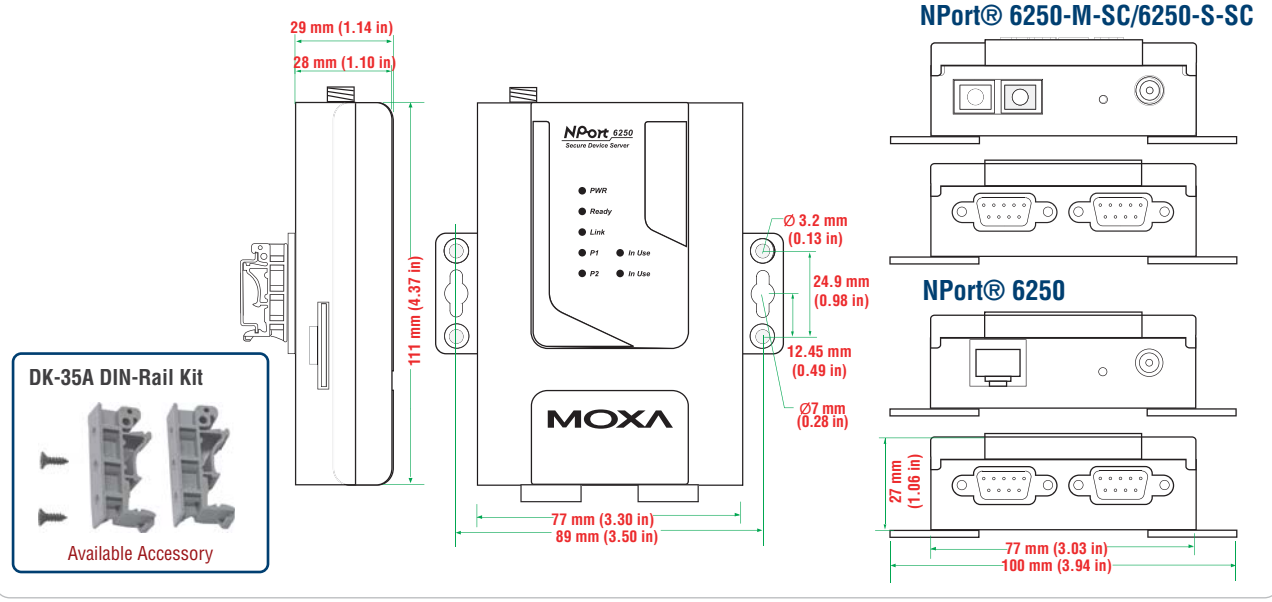
MTBF (meantime between failures):
NPort 6250: 226128 hrs
NPort 6250-M-SC: 225762 hrs
NPort 6250-S-SC: 225762 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



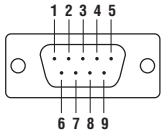
DK-35A DIN-Rail Kit

Available Accessory

Pin Assignment

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

DB9 male connector



Ordering Information

Available Models

NPort 6250: 2-port secure device server, RS-232/422/485 to Ethernet

NPort 6250-M-SC: 2-port secure device server, RS-232/422/485 to multi-mode fiber (SC connector)

NPort 6250-S-SC: 2-port secure device server, RS-232/422/485 to single-mode fiber (SC connector)

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail

NP21101: DB25 male to DB9 female RS-232 cable, 30 cm

Package Checklist

- NPort® 6250 device server
- Power Adaptor
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

NPort® 6450

4-port RS-232/422/485 secure terminal server

- LCD panel for easy IP address configuration
- Secure operation modes for Real COM, TCP Server, TCP Client, Pair Connection, Terminal and Reverse Terminal
- Non-standard baudrates supported with high precision
- Port buffers for storing serial data when the Ethernet is off-line
- Supports IPv6
- Ethernet redundancy (STP/RSTP/Turbo Ring) with network module

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The NPort® 6450 is a 4-port device server that uses the SSL and SSH protocols to transmit encrypted serial data over Ethernet. Up to 4 serial devices of any type can be connected to the NPort® 6450, witn all four devices using the same IP address. The Ethernet port can be configured for a normal or secure TCP/IP connection.

No Data Loss if Ethernet Connection Fails

The NPort® 6450 is a reliable device server that provides users with secure serial-to-Ethernet data transmission and a customer-oriented hardware design. If the Ethernet connection fails, the NPort® 6450 will queue all serial data in its internal 64 KB port buffer. When the Ethernet connection is re-established, the NPort® 6450 will immediately release all data in the buffer in the order that it was received. Users can increase the port buffer size by installing an SD card.

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation: 1.5 KV built-in

Optical Fiber Interface (with network module)

Fiber Port: 100BaseFX, SC connector
Distance:
Multi-mode: 0 to 2 km, 1310 nm (62.5/125 µm, 500 MHz*km)
Single mode: 0 to 40 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))
Min. TX Output:
Multi-mode: -20 dBm
Single-mode: -5 dBm
Max. TX Output:
Multi-mode: -14 dBm
Single-mode: 0 dBm
Sensitivity:
Multi-mode: -34 to -30 dBm
Single-mode: -36 to -32 dBm

Serial Interface

Number of Ports: 4
Serial Standards: RS-232/422/485
Connector: DB9 male
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Serial Line Protection: 15 KV ESD protection for all signals
Console Port: Serial port 1 doubles as RS-232 console port

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, XON/XOFF
Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates)
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Memory Expansion Slot

Slot Type: SD socket (supports up to 1 GB)

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE, DDNS
Security Protocols: DES, 3DES, AES, SSH, SSL, HTTPS, RADIUS, PAP, CHAP, TACACS+

Configuration Options: Web Console, Serial Console, Telnet Console, Windows Search Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: 2.4.x, 2.6.x

Management: SNMP MIB-II

IP Routing: Static, RIP-I, RIP-II

Operation Modes

Standard: Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled

Secure: Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH

Terminal Sessions: 8 sessions per port

Physical Characteristics

Case: Metal, IP30 protection

Weight: 1020 g

Dimensions:
Without ears: 158 x 103 x 35 mm (6.22 x 4.06 x 1.38 in)
With ears: 181 x 103 x 35 mm (7.13 x 4.06 x 1.38 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 70°C (-4 to 158°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 730 mA @ 12 V, 330 mA @ 24 V

Power Line Protection: 1 KV burst (EN61000-4-4: EFT/B), 0.5 KV surge (EN61000-4-5)

Regulatory Approvals

EMC: CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A

Safety: UL (UL60950-1), TÜV (EN60950-1)

EN61000-4-2 (ESD): Level 3

EN61000-4-4 (EFT): Level 2

EN61000-4-5 (Surge): Level 2

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

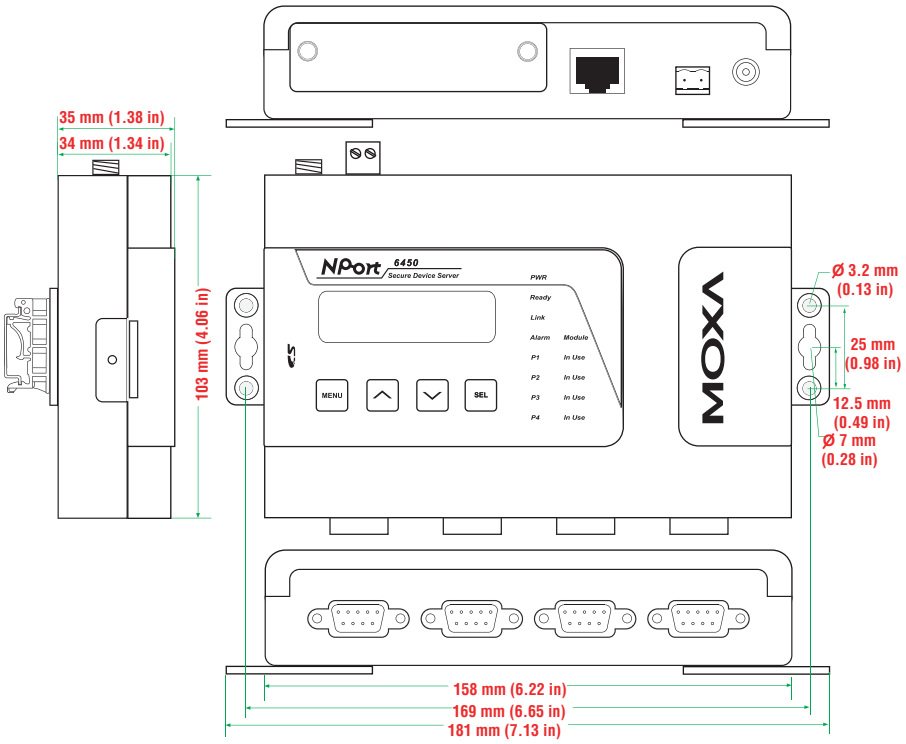
MTBF (meantime between failures): 120354 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

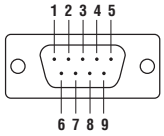
Dimensions



Pin Assignment

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

DB9 male connector



Ordering Information

Available Models

NPort 6450: 4-port secure device server, RS-232/422/485 to Ethernet

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail

Package Checklist

- NPort® 6450 secure device server
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Expansion Modules			Use with the following NPort® models					
			6150	6250	6450	6610-8 6650-8	6610-16 6650-16	6610-32 6650-32
NM-TX01		1 10/100BaseTX port	---	---	√	√	√	√
NM-TX02		2 10/100BaseTX port	---	---	√	√	√	√
NM-FX01-S-SC		1 100BaseFX port, single mode, SC connector	---	---	√	√	√	√
NM-FX01-M-SC		1 100BaseFX port, multi mode, SC connector	---	---	√	√	√	√
NM-FX02-S-SC		2 100BaseFX ports, single mode, SC connector	---	---	√	√	√	√
NM-FX02-M-SC		2 100BaseFX ports, multi mode, SC connector	---	---	√	√	√	√
NM-GPRS/GSM		1 GPRS/GSM modem module	---	---	√	√	√	√
NM-Modem		1 PSTN modem port with RJ11 connector	---	---	√	√	√	√

Note: Expansion modules can be purchased separately.

NPort® 6600 Series

8/16/32-port RS-232/422/485 rackmount terminal servers

- Up to 32 ports for high density environments
- Non-standard baudrates supported with high precision
- Port buffers for storing serial data when the Ethernet is off-line
- Supports IPv6
- Ethernet redundancy (STP/RSTP/Turbo Ring) with network module
- Modular design for network expansion
- Secure data transmission

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

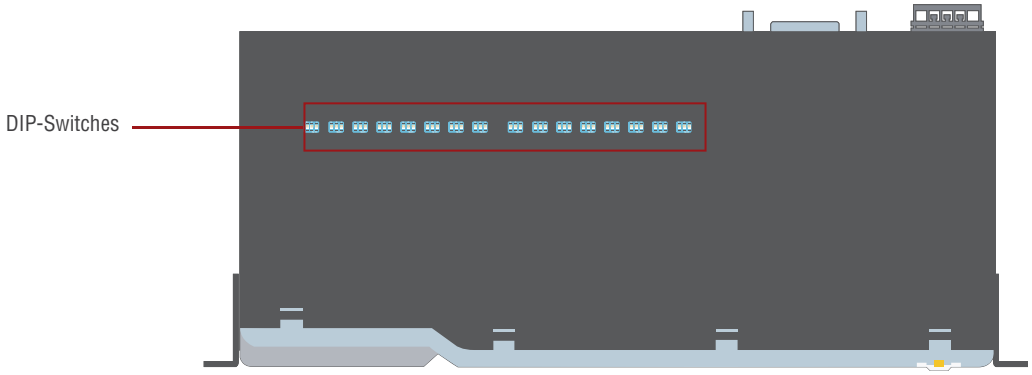
The NPort® 6600 series of secure device servers is the right choice for applications that use large numbers of serial devices packed into a small space. If you're worried about security, you can rest assured with the NPort® 6600, since it supports DES, 3DES, and AES, the three most common standards for data encryption. Serial devices of any type can be connected to the NPort® 6600, and each serial port on the NPort® can be configured independently for RS-232, RS-422, or RS-485 transmission.

LCD Panel Makes Configuration Easy

The NPort® 6600 has a built-in LCD panel for configuration. The panel displays the server name, serial number, and IP address, and any of the device server's configuration parameters, such as IP address, netmask, and gateway address, can be updated easily and quickly.

Adjustable Resistor Values for RS-485 Communication

The NPort® 6600 provides adjustable termination, pull high, and pull low resistors for RS-485 communication. In some critical environments, termination resistors may be needed to prevent the reflection of serial signals, and the pull high and pull low resistors may need adjusting to maintain the integrity of the electrical signal. Since no set of resistor values works for every environment, the NPort® 6600 allows manual adjustment of the resistor values for each serial port using built-in DIP switches.



Specifications

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation: 1.5 KV built-in

Optical Fiber Interface (with network module)

Fiber Port: 100BaseFX, SC connector

Distance:
Multi-mode: 0 to 2 km, 1310 nm (62.5/125 µm, 500 MHz*km)
Single mode: 0 to 40 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))

Min. TX Output:
Multi-mode: -20 dBm
Single-mode: -5 dBm

Max. TX Output:
Multi-mode: -14 dBm
Single-mode: 0 dBm

Sensitivity:
Multi-mode: -34 to -30 dBm
Single-mode: -36 to -32 dBm

Serial Interface

Number of Ports: 8, 16, or 32

Serial Standards:
NPort 6610: RS-232
NPort 6650: RS-232/422/485

Connector: 8-pin RJ45

RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)

Serial Line Protection: 15 KV ESD protection for all signals

Console Port: Dedicated RS-232 console port on rear panel (8-pin RJ45)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, DTR/DSR, XON/XOFF

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates)

Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Terminator for RS-485: 120 Ω

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

RS-485-2w: Data+, Data-, GND

Memory Expansion Slot

Slot Type: SD socket (supports up to 1 GB)

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE, DDNS

Security Protocols: DES, 3DES, AES, SSH, SSL, HTTPS, RADIUS, PAP, CHAP, TACACS+

Configuration Options: Web Console, Serial Console, Telnet Console, Windows Search Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: 2.4.x, 2.6.x

Management: SNMP MIB-II

IP Routing: Static, RIP-I, RIP-II

Operation Modes

Standard: Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled

Secure: Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH

Terminal Sessions: 8 sessions per port

Physical Characteristics

Case: Metal, IP30 protection

Weight:
NPort 6600-8: 3460 g
NPort 6600-16: 3580 g
NPort 6600-32: 3600g

Dimensions:
Without ears: 440 x 195 x 44 mm (17.32 x 7.68 x 1.73 in)
With ears: 480 x 195 x 44 mm (18.9 x 7.68 x 1.73 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 70°C (-4 to 158°F)

Power Requirements

Input Voltage:
AC Models: 100 to 240 VAC
DC Models: ±48 VDC (20 to 72 VDC, -20 to -72 VDC)

Power Consumption:
AC Models: 285 mA @ 100 VAC, 190 mA @ 240 VAC
DC Models: 293 mA @ 48 VDC

Power Line Protection: 1 KV burst (EN61000-4-4: EFT/B), 0.5 KV surge (EN61000-4-5)

Regulatory Approvals

EMC: CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A

Safety: UL (UL60950-1), TÜV (EN60950-1)

EN61000-4-2 (ESD): 4 KV contact

EN61000-4-4 (EFT): 1 KV power

EN61000-4-5 (Surge): 2 KV power

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

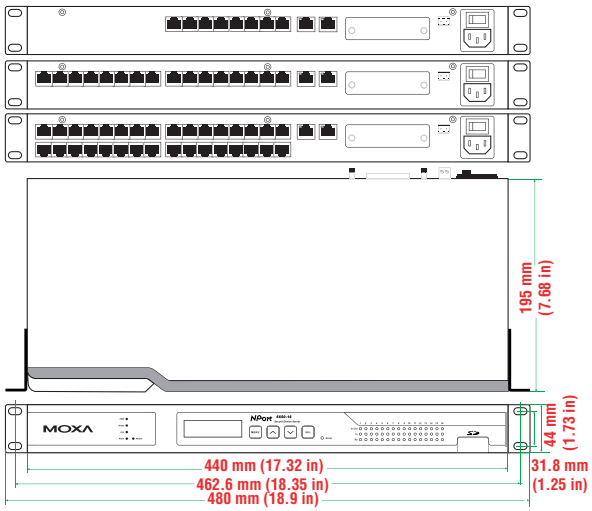
MTBF (meantime between failures):
NPort 6610-8: 135891 hrs
NPort 6610-16: 102373 hrs
NPort 6610-32: 68707 hrs
NPort 6650-8: 135370 hrs
NPort 6650-16: 101783 hrs
NPort 6650-32: 68177 hrs

Warranty

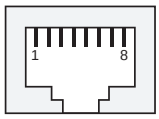
Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions and Pin Assignment



8-pin RJ45 connector



PIN	RS-232	RS-422/ 485-4W	RS-485-2w
1	DSR (in)	---	---
2	RTS (out)	TxD+	---
3	GND	GND	GND
4	TxD (out)	TxD-	---
5	RxD (in)	RxD+	Data+
6	DcD (in)	RxD-	Data-
7	CTS (in)	---	---
8	DTR (out)	---	---

Ordering Information

Available Models

NPort 6610-8: 8-port RS-232 to Ethernet secure terminal server, 100 to 240 VAC power input
NPort 6610-8-48V: 8-port RS-232 to Ethernet secure terminal server, ±48 VDC power input
NPort 6610-16: 16-port RS-232 to Ethernet secure terminal server, 100 to 240 VAC power input
NPort 6610-16-48V: 16-port RS-232 to Ethernet secure terminal server, ±48 VDC power input
NPort 6610-32: 32-port RS-232 to Ethernet secure terminal server, 100 to 240 VAC power input
NPort 6610-32-48V: 32-port RS-232 to Ethernet secure terminal server, ±48 VDC power input
NPort 6650-8: 8-port RS-232/422/485 to Ethernet secure terminal server, 100 to 240 VAC power input
NPort 6650-8-48V: 8-port RS-232/422/485 to Ethernet secure terminal server, ±48 VDC power input
NPort 6650-16: 16-port RS-232/422/485 to Ethernet secure terminal server, 100 to 240 VAC power input
NPort 6650-16-48V: 16-port RS-232/422/485 to Ethernet secure terminal server, ±48 VDC power input
NPort 6650-32: 32-port RS-232/422/485 to Ethernet secure terminal server, 100 to 240 VAC power input
NPort 6650-32-48V: 32-port RS-232/422/485 to Ethernet secure terminal server, ±48 VDC power input

Package Checklist

- NPort® 6600 device server
- CBL-RJ45M9-150: 8-pin RJ45 to DB9 male connection cable, 150 cm
- Power Cord (AC models only)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Optional Accessories (can be purchased separately)

Serial Cables and Adaptors: See Appendix A for details

Expansion Modules			Use with the following NPort® models					
			6150	6250	6450	6610-8 6650-8	6610-16 6650-16	6610-32 6650-32
NM-TX01		1 10/100BaseTX port	---	---	√	√	√	√
NM-TX02		2 10/100BaseTX port	---	---	√	√	√	√
NM-FX01-S-SC		1 100BaseFX port, single mode, SC connector	---	---	√	√	√	√
NM-FX01-M-SC		1 100BaseFX port, multi mode, SC connector	---	---	√	√	√	√
NM-FX02-S-SC		2 100BaseFX ports, single mode, SC connector	---	---	√	√	√	√
NM-FX02-M-SC		2 100BaseFX ports, multi mode, SC connector	---	---	√	√	√	√
NM-GPRS/GSM		1 GPRS/GSM modem module	---	---	√	√	√	√
NM-Modem		1 PSTN modem port with RJ11 connector	---	---	√	√	√	√

Note: Expansion modules can be purchased separately.

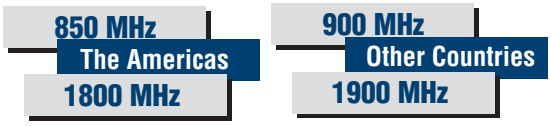
NM-GPRS/GSM Module

4-port cellular NM-GPRS/GSM module (for the NPort® 6400/6600 series)

- Quad-band 900/1800, 850/1900 MHz GSM/GPRS
- Cellular Status/Signal LED indicator
- GPRS Class 10
- CSD data connection
- Up to 14,400 bps in Circuit Switched Data mode
- Short message alerts
- Real COM mode supported

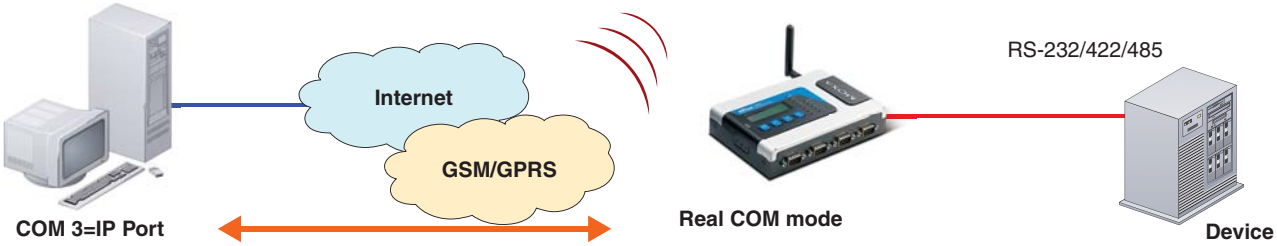
Quad-band GSM/GPRS Communication

Most countries in the world use the GSM-900 and GSM-1800 cellular frequencies. However, in the United States, Canada, and other parts of the Americas, GSM-850 and GSM-1900 are used. With the NM-GPRS/GSM quad-band cellular module, you don't need to worry about selecting different products for different parts of the world. The NM-GPRS/GSM module's GSM/GPRS band is configured at 900/1800 MHz by default, but can be easily reconfigured to 850/1900 MHz.



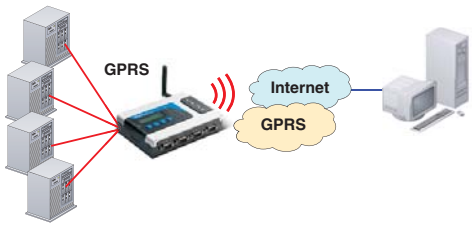
Real COM Mode

NPort® products come with Real COM drivers for Windows operating systems and Real TTY drivers for Linux operating systems used in a GSM/GPRS network environment. In Real COM mode, the bundled drivers are able to establish a transparent connection between a host and a serial device by mapping the serial port on the NPort® to a local COM/TTY port on the host computer. One of the major conveniences of using Real COM mode is that it allows you to use software that was written for pure serial communication applications.



GSM CSD Data Connection

CSD (Circuit Switched Data) provides direct modem access to remote devices, and system extensions can be used without installing cables and data lines. CSD transmits data at 9.6 to 14.4 Kbps to both GSM networks and the PSTN switching subsystem by calling direct. CSD overcomes the limitations of hard wiring and inaccessible terrain for easier, more flexible data collection and monitoring of applications that use NPort® device servers.

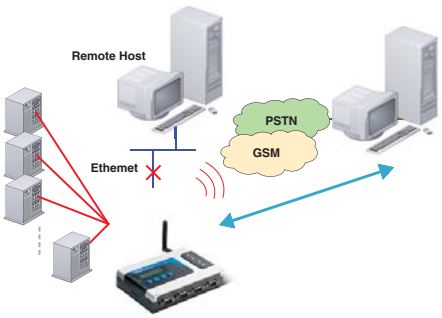


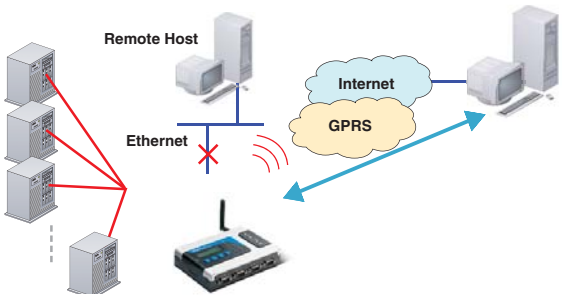
GPRS IP Connectivity

A GPRS packet-switched system can be viewed as a special IP network that offers IP connectivity to IP terminals. Devices without PPP or TCP/IP capability can be easily connected to the IP network and the Internet through GPRS by using the NPort® GSM/GPRS module.

GSM/GPRS Backup Application

The NM-GPRS/GSM module can be used to provide the NPort® with automatic backup capability. When the backup function is enabled, the NPort® will check the remote host's connection on the Ethernet side after power-on. If a connection failure occurs, data from the serial device will be sent out through the GSM/GPRS network. When the remote host on the Ethernet side returns to normal status, data will again be sent through the Ethernet connection. The NPort® backup function makes your data transmission safer and more reliable.

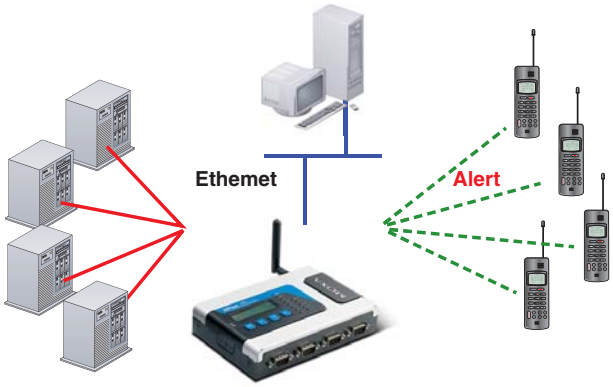




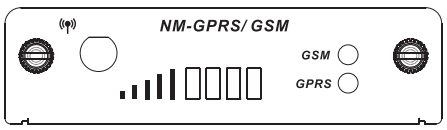
SMS Alerts by Event

The NM-GPRS/GSM module provides the NPort® device server with an SMS alert function that support up to 4 phone numbers. As shown in the table, there are four event categories (System, Network, Configure, Serial Port), and a total of eight different options that can be configured.

System Events	Network Events	Configure Events	Serial Port Events
Cold start	Ethernet link down	Console login authentication failure	DCD changed
Warm start	---	Ethernet IP changed	DSR changed
---	---	Password changed	---



Appearance



Cellular Status and Signal Strength LEDs	
GSM	Lights up when the GSM is connected
GPRS	Lights up when the GPRS is connected
Signal Strength	Number of lit LEDs indicates the signal strength

Specifications

Cellular Interface

Standards: GSM and GPRS

Band Options: 850/900 MHz and 1800/1900 MHz quad-band

GPRS Multi-slot Class: Class 10

GPRS Terminal Device Class: Class B

GPRS Coding Schemes: CS1 to CS4

CSD Data Transmission Rate: Up to 14,400 bps

SIM Control: Point-to-point Text/PDU, Mobile Originated (MO) and Mobile Terminated (MT Cell Broadcast is in accordance with GSM 07.05)

Antenna: SMA female type connecter, 50 W impedance and 1 dBm peak gain

NM-Modem Module

PSTN modem network module (for the NPort® 6400/6600 series)

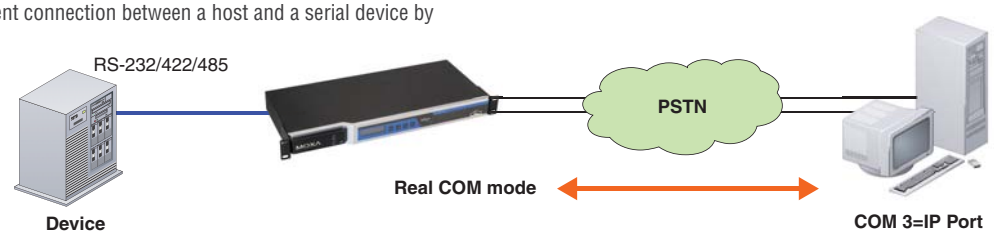
- Dial-in
- Dial-out
- Auto-answer
- PSTN leased-line mode (modem always on)
- PSTN economy-line mode (modem connects periodically)
- PSTN backup mode

Overview

The NM-Modem PSTN module can be used with any of the 4, 8, 16, and 32-port models. The module enables NPort® 6000 terminal servers to transmit data over PSTN networks.

Real COM Mode Supported

NPort 6000 device servers come with Real COM /TTY drivers for PSTN network applications. Real COM drivers are available for Windows operating systems and Real TTY drivers are available for Linux operating systems. In Real COM mode, the drivers can establish a transparent connection between a host and a serial device by mapping an NPort® 6000 serial port to a local COM/TTY port on the host computer. One of the major conveniences of using Real COM mode is that you can use software that was written for pure serial communication applications.

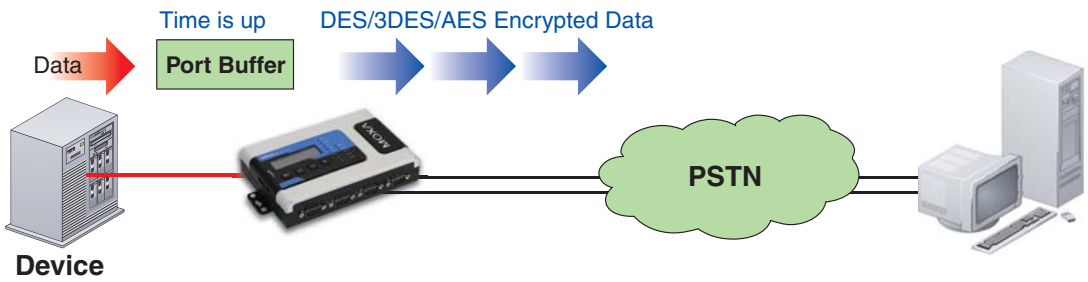


PSTN Leased-line Mode—Modem Always On

When Trunk-line mode is being used, the PSTN connection is always on, and data coming from the serial device will be sent out through the PSTN network as soon as the NPort® receives the data. In addition, the remote PC/Server will be able to manage the NPort® and poll for data from the serial device through the PSTN. Once the NPort® 6000 is powered on, the NM-Modem will always be on, making this operation mode suitable for applications that use a PSTN leased line.

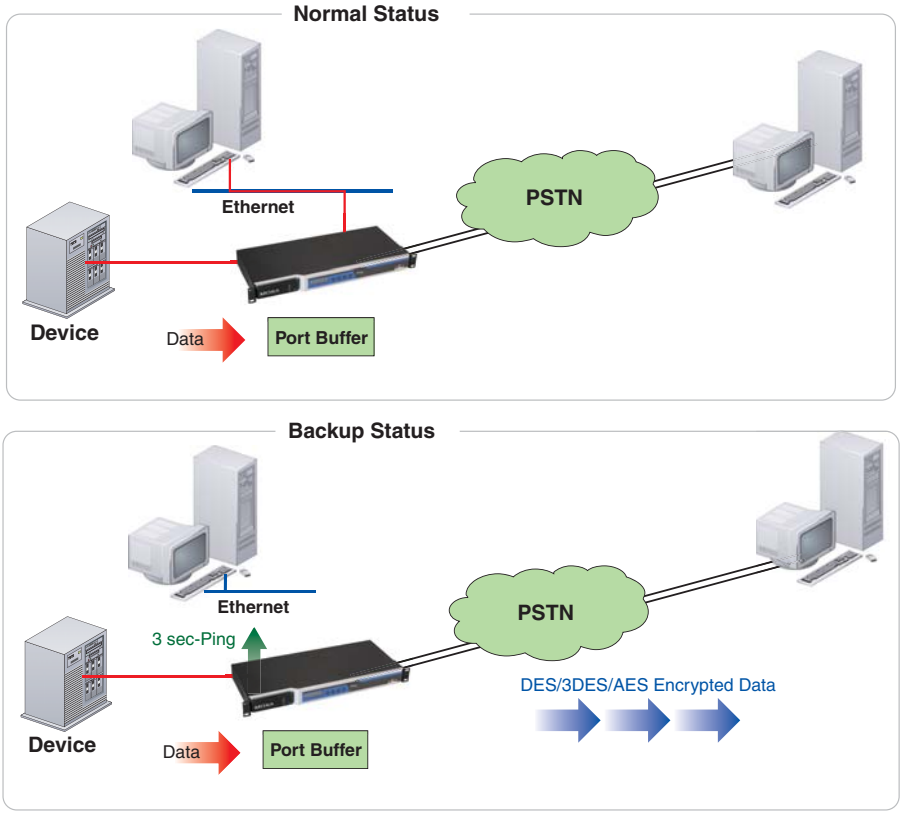
PSTN Economy-line Mode

When Economy-line mode is being used, the PSTN connection is activated periodically. In this case, data coming from the serial device will be stored in the NPort's buffer until the next PSTN activation time. Only then will the data be sent out through the PSTN network. In addition, when the PSTN connection is active, the remote PC/Server will be able to manage the NPort and poll for data from the serial device through the PSTN. When in Economy-line mode, the NPort® will de-activate the PSTN line if there is no data transmission activity for a preset idle time. Economy-line mode is suitable for non-urgent data transmission and message collection applications, and for applications that use a non-leased PSTN line.



PSTN Backup Mode

The NM-Modem module can be used to provide the NPort® with an automatic backup over a PSTN. When the backup function has been enabled, the NPort® will activate the PSTN line whenever the Ethernet fails. The backup data can either be sent to the same PC/server, or to an alternate backup machine. While the PSTN is active, the NPort® will repeatedly ping the PC/Server host over the Ethernet until it receives a response. Once the NPort® determines that the Ethernet has been re-activated, the PSTN will be de-activated, and the NPort® will resume sending and receiving data over the Ethernet.



Appearance

LED Indicators

LED Name	Color	Meaning
DCD	Green	Carrier detected
	Off	No carrier detected
TxD	Green	Data is being transmitted to the PSTN
	Off	No data is being transmitted through the PSTN
RxD	Green	Data is being received from the PSTN
	Off	No data is being received through the PSTN

Specifications

Modem

Serial I/O Interface: 3 V TTL
Error Correction: V.42, MNP 2-4, 10-error
V92HM-RC Data Rate: 56 Kbps max.
Data Compression: V.42bis and MNP-5
336HM-RC Data Rate: 33.6 Kbps max.
FAX: 14.4K send/receive
144HM-RC Data Rate: 24.4 Kbps max.
Additional Features:
• Low Power Sleep Mode
• Caller ID and DTMF tone detection
• Digital Line Guardd Protection
• Extension Pickup, Line in Use Detection
• Completely Integrated On Board DAA

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F)

Regulatory Approvals

Medical Device: EN60601-1
FCC/IC: FCC Part 68 and IC CS03 approved
UL: UL 60950 recognized component
Green Product: RoHS compliant
CE Certification: EN60950-1, IEC 60950-1, EN55024, EN55022, TS103 021-2

CN2600 Series

8/16-port RS-232/422/485 terminal servers with LAN redundancy

- LCD panel for easy IP address configuration
- Dual-LAN cards with two independent MAC addresses and IP addresses
- Redundant COM function available when both LANs are active
- Dual-host redundancy can be used to add a backup PC to your system
- Dual AC power inputs
- Real COM/TTY drivers for Windows and Linux

The certification logos shown here apply to some or all of the products in this section. Please see the **Specifications** section or Moxa's website for details.

Overview

Redundancy is an important issue for industry, and several different solutions have been developed to prevent damage caused by equipment or software failures. "Watchdog" hardware is required to utilize redundant hardware, and a "Token" switching mechanism is required for software. The CN2600 terminal server uses its built-in dual-LAN ports to implement a "redundant COM" mode that keeps your applications running smoothly.

Dual-LAN Redundancy

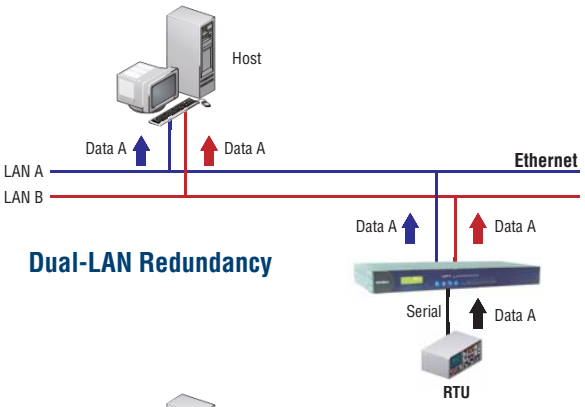
The CN2600 has two separate LAN ports that can be connected to separate LAN networks. Dual-LAN redundancy involves setting up two separate physical networks to connect the PC host with the CN2600. In this case, the PC host must also be installed with two LAN cards. If one of the networks fails, the PC host will still be able to communicate with your serial devices over the redundant LAN.

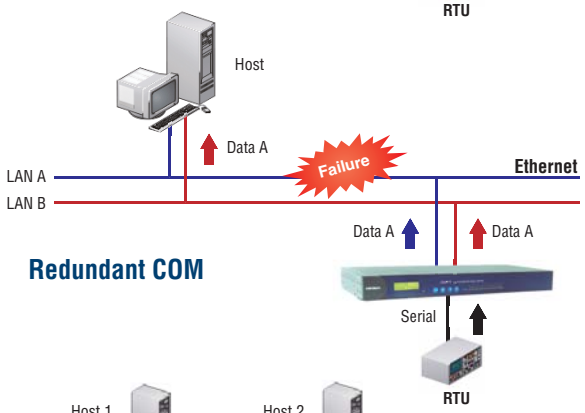
Redundant COM

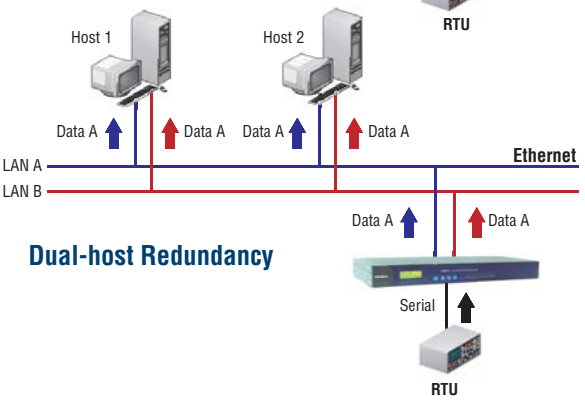
The "Redundant COM" (patent pending) operation mode can be used to set up a redundant LAN between the CN2600's COM ports and the host computer. The redundant structure involves using the CN2600's two LAN ports to set up two independent LANs that connect the CN2600 to the host computer. If either of the two LANs fails, the other LAN will continue transmitting packets between the serial devices and the host, with the data transmitted through the CN2600. One of the biggest advantages of using Moxa's Redundant COM mode is that the "switching time" is zero. What this means is that if one of the LANs fails, data transmission between the PC host the serial devices will not be interrupted.

Dual-host Redundancy

The CN2600's dual LAN cards can also be used to set up "dual-host" redundancy. In this case, both networks (LAN A and LAN B in the figure) are connected to two different hosts. If either of the two hosts shuts down unexpectedly, the other host will continue transmitting packets to (and receiving packets from) the serial devices connected to the CN2600.

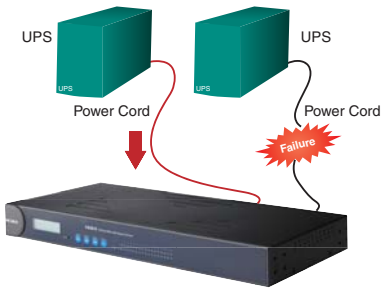




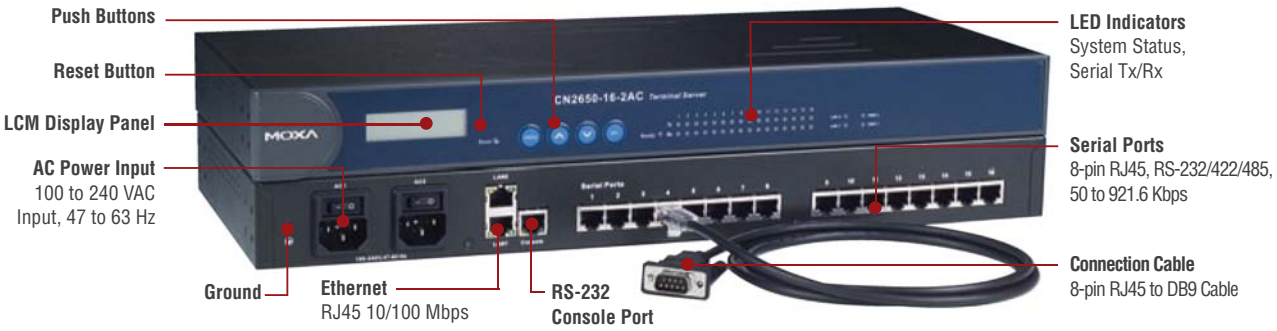


Dual-AC Model Supported

Dual-power redundancy uses two power inputs and redundant internal power supplies to ensure that all of the CN2600's functions will be available, even in the event of power circuit failure.



Appearance



Specifications

Ethernet Interface

Number of Ports: 2

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation: 1.5 KV built-in

Serial Interface

Number of Ports: 8 or 16

Serial Standards:
CN2610: RS-232
CN2650/2650I: RS-232/422/485

Connector:
CN2610/2650: 8-pin RJ45
CN2650I: DB9 male

RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)

Serial Line Protection:
15 KV ESD protection for all signals
2 KV optical isolation (CN2650I)

Console Port: Dedicated RS-232 console port on rear panel (8-pin RJ45)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, DTR/DSR, XON/XOFF

Baudrate: 50 bps to 921.6 Kbps

Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Terminator for RS-485: 120 Ω

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE, DDNS

Security Protocols: RADIUS, HTTPS, SSH, PAP, CHAP

Configuration Options: Web Console, Serial Console, Telnet Console, Windows Search Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: 2.4.x, 2.6.x

Management: SNMP MIB-II

IP Routing: Static, RIP-I, RIP-II

Operation Modes

Standard: Real COM, TCP Server, TCP Client, UDP, RFC2217, Terminal, Reverse Telnet, PPP, DRDAS, Redundant COM, Disabled

Applications

Terminal Sessions: 8 sessions per port

Physical Characteristics

Case: Metal, IP30 protection

Weight:
CN2610-8: 3525 g
CN2610-16: 3560 g
CN2610-8-2AC: 3760 g
CN2610-16-2AC: 3810 g
CN2650-8: 3740 g
CN2650-16: 3790 g
CN2650-8-2AC: 3900 g
CN2650-16-2AC: 3980 g
CN2650I-8: 3666 g
CN2650I-16: 3776 g
CN2650I-8-2AC: 3932 g
CN2650I-16-2AC: 4022 g

Dimensions:
Without ears: 440 x 198 x 45 mm (17.32 x 7.80 x 1.77 in)
With ears: 480 x 198 x 45 mm (18.9 x 7.80 x 1.77 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 70°C (-4 to 158°F)

Power Requirements

Input Voltage: 100 to 240 VAC, 47 to 63 Hz
Power Consumption: 235 mA @ 100 VAC, 145 mA @ 240 VAC
Power Line Protection: 1 KV burst (EN61000-4-4: EFT/B), 2 KV surge (EN61000-4-5)

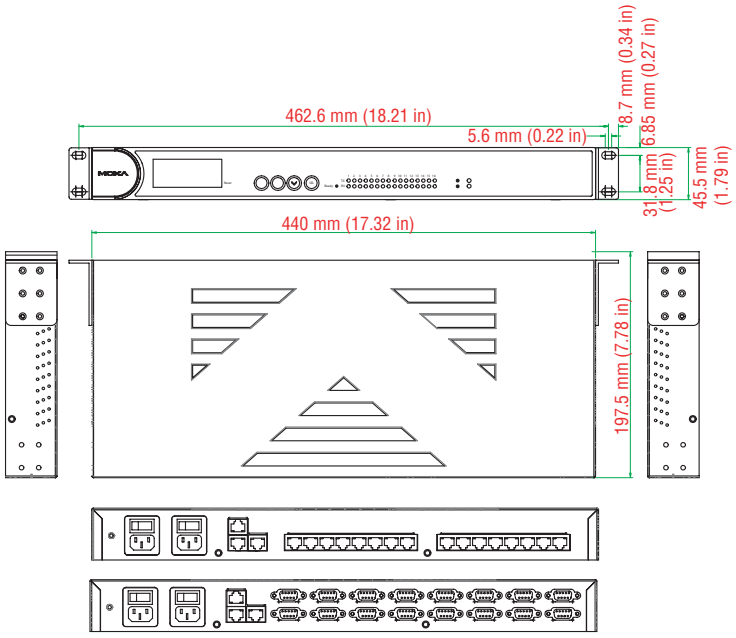
Regulatory Approvals

EMC: CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A
Safety: UL (UL60950), TÜV (EN60950)
EN61000-4-2 (ESD): Level 3
EN61000-4-4 (EFT): Level 4
EN61000-4-5 (Surge): Level 2
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (meantime between failures): 99302 hrs

Warranty

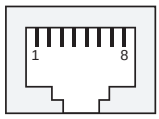
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions



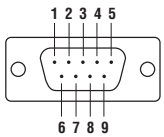
Pin Assignment

8-pin RJ45 connector



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DSR	–	–
2	RTS	TxD+(B)	–
3	GND	GND	GND
4	TxD	TxD-(A)	–
5	RxD	RxD+(B)	Data+(B)
6	DCD	RxD-(A)	Data-(A)
7	CTS	–	–
8	DTR	–	–

DB9 male connector



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Ordering Information

Available Models

CN2610-8: Dual-LAN terminal server with 8 RS-232 ports
CN2610-16: Dual-LAN terminal server with 16 RS-232 ports
CN2610-8-2AC: Dual-LAN, dual-AC-power terminal server with 8 RS-232 ports
CN2610-16-2AC: Dual-LAN, dual-AC-power terminal server with 16 RS-232 ports
CN2650-8: Dual-LAN terminal server with 8 RS-232/422/485 ports
CN2650-16: Dual-LAN terminal server with 16 RS-232/422/485 ports
CN2650-8-2AC: Dual-LAN, dual-AC-power terminal server with 8 RS-232/422/485 ports
CN2650-16-2AC: Dual-LAN, dual-AC-power terminal server with 16 RS-232/422/485 ports
CN2650I-8: Dual-LAN terminal server with 8 RS-232/422/485 ports and 2 KV optical isolation
CN2650I-16: Dual-LAN terminal server with 16 RS-232/422/485 ports and 2 KV optical isolation
CN2650I-8-2AC: Dual-LAN, dual-AC-power terminal server with 8 RS-232/422/485 ports and 2 KV optical isolation
CN2650I-16-2AC: Dual-LAN, dual-AC-power terminal server with 16 RS-232/422/485 ports and 2 KV optical isolation

Package Checklist

- CN2600 terminal server
- CBL-RJ45F9-150: 8-pin RJ45 to DB9 female connection cable, 150 cm
- 2 power cords (AC models only)*
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Optional Accessories (can be purchased separately)

Serial Cables and Adaptors: See Appendix A for details

Serial Device Servers

Product Selection Guides

Combo Switch / Serial Device Server 8-2
General-purpose Device Servers 8-3
Industrial-grade Device Servers 8-7
Embedded Device Servers 8-8

General-purpose Device Servers

Introduction to Serial Device Servers 8-9
Case Study: Power Generation 8-14
Case Study: Automatic Meter Reading 8-15
NPort® S8000 Series Combo switch / serial device server 8-16
NPort® 5100 Series 1-port RS-232/422/485 serial device servers 8-20
NPort® DE-211/311 1-port RS-232/422/485 serial device servers 8-23
NPort® 5200 Series 2-port RS-232/422/485 serial device servers 8-25
NPort® 5400 Series 4-port RS-232/422/485 serial device servers 8-29
NPort® 5600 Rackmount Series 8/16-port RS-232/422/485 serial device servers . . . 8-32
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Device Servers for Industrial Automation

NPort® IA5000 Series 1 and 2-port serial device servers for industrial automation . . . 8-38

Embedded Device Servers

MiiNePort E1 Series 10/100 Mbps embedded serial device servers 8-42
NE-4100 Series 10/100 Mbps embedded serial device servers 8-45
WE-2100T Series Wireless LAN embedded serial device servers 8-49

8

Serial Device Servers

Combo Switch / Serial Device Server

NPort S8000: Ethernet Switch Specifications

Ethernet Interface	
Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) and 100Base FX IEEE 802.3x for Flow Control IEEE 802.1D for Spanning Tree Protocol IEEE 802.1w for Rapid STP IEEE 802.1Q for VLAN Tagging IEEE 802.1p for Class of Service IEEE 802.1X for Authentication IEEE 802.3ad for Port Trunk with LACP
Network Protocols	ICMP, IP, TCP, UDP, ARP, Telnet, DNS, HTTP, SMTP, SNTP, IGMPv1/v2 device, GVRP, SNMPv1/v2c/v3, DHCP Server/ Client, DHCP Option 82, BootP, TFTP, SNTP, SMTP, RARP, GMRP, LACP, RMON
MIB	MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control	IEEE 802.3x flow control, back pressure flow control interface
Optical Fiber Interface	
Type	Multi-mode
Distance	0 to 2 km, 1310 nm (62.5/125 µm, 500 MHz*km)
Min. TX Output	-20 dBm
Max. TX Output	-14 dBm
Sensitivity	-34 to -30 dBm
Switch Properties	
Priority Queues	4
Max. Number of Available VLANs	64
VLAN ID Range	VID 1 to 4094
IGMP Groups	256
Switch Interface	
RJ45 Ports	10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
DIP Switches	Turbo Ring, Master, Coupler, Reserve
Alarm Contact	2 relay outputs with current carrying capacity of 1A @ 24 VDC

NPort S8000: General Specifications

Port Summary	
Serial Ports	4 RS-232/422/485 ports
Ethernet Switch Ports	3 RJ45 copper ports, 2 multi-mode fiber ports
Console Ports	1 (8-pin RJ45 connector)
LED Indicators	PWR1, PWR2, READY, MASTER, COUPLER, LINK4, LINK5
Physical Characteristics	
Housing	Metal
Weight	995 g
Dimensions	73.1 x 134 x 105 mm
Environmental Limits	
Operating Temperature	0 to 60°C
Operating Humidity	5 to 95% RH
Storage Temperature	-40 to 85°C
Power Requirements	
Input Voltage	12 to 48 VDC
Power Consumption	935mA @ 12 V, 470 mA @ 24 V
Regulatory Approvals	
EMC	CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A
Safety	UL-508, UL (UL60950-1), LVD (EN60950-1)
EMS	IEC 61000-4-2, Level 4 (ESD) IEC 61000-4-4, Level 4 (EFT) IEC 61000-4-5 for serial port, Level 1 (Surge) IEC 61000-4-5 for Power Line, Level 3 (Surge) IEC 61000-4-5 for LAN port, Level 2 (Surge)
Reliability	
Buzzer, RTC, WDT	√
Warranty	5 years (see www.moxa.com/warranty)

NPort S8000: Device Server Specifications

Serial Interface	
Number of Ports	4
Serial Standards	RS-232/422/485
Connectors	DB9 male
Serial Line Protection	15 KV ESD protection for all signals 2 KV isolation protection
RS-485 Data Direction Control	ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485	1 KΩ, 150 KΩ
Terminator for RS-485	55 Ω, 120 Ω
Console Port	Dedicated RS-232 console port (8-pin RJ45)
Serial Communication Parameters	
Data Bits	5, 6, 7, 8
Stop Bits	1, 1.5, 2
Parity	None, Even, Odd, Space, Mark
Flow Control	RTS/CTS and XON/XOFF
Baudrate	50 bps to 921.6 Kbps
Serial Signals	
RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422	Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w	Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w	Data+, Data-, GND
Software	
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Search Utility
Windows Real COM Drivers	Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i
Linux Real TTY Drivers	2.4.x, 2.6.x
Operation Modes	Real COM, TCP Server, TCP Client, UDP, RFC2217
Management	SNMP MIB-II
IP Routing	Static, RIP-I, RIP-II
Reliability	
Alert Tools	Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger	Built-in WDT (watchdog timer)

General-purpose Device Servers

	NPort® 5110 NPort® 5110-T	NPort® 5130	NPort® 5150	NPort® DE-211	NPort® DE-311	NPort® 5210 NPort® 5210-T	NPort® 5230 NPort® 5230-T
Ethernet Interface							
10BaseT Ports	---	---	---	1	---	---	---
10/100BaseT(X) Ports	1	1	1	---	1	1	1
100BaseFX	---	---	---	---	---	---	---
Connector	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface							
RS-232 Ports	1	---	---	---	---	2	1
RS-232/422 Ports	---	1	---	---	---	---	1
RS-232/422/485 Ports	---	---	1	1	1	---	---
Connector	DB9-M	DB9-M	DB9-M	DB25-F	DB9-F	RJ45	TB
15 KV ESD Protection	√	√	√	√	√	√	√
2 KV Isolation Protection	---	---	---	---	---	---	---
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark						
Flow Control	RTS/CTS, XON/XOFF						
Baudrate	110 bps to 230.4 Kbps	50 bps to 921.6 Kbps		50 bps to 230.4 Kbps		110 bps to 230.4 Kbps	
Software							
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP			DHCP, BOOTP, Telnet, TCP, UDP, IP, ICMP, ARP		ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP	
Web Console	√	√	√	---	---	√	√
Serial Console	√	---	√	√	√	√	√
Telnet Console	√	√	√	√	√	√	√
Windows Utility	√	√	√	√	√	√	√
Windows Real COM Drivers	Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded						
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i						
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x						
Onsite Configuration							
Mini Screen with Push Buttons	---	---	---	---	---	---	---
Physical Characteristics							
Housing	Metal	Metal	Metal	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	340 g	340 g	340 g	480 g	480 g	340 g	360 g
Dimensions	52 x 80 x 22 mm			67 x 100.4 x 22 mm			
Environmental Limits							
Operating Temparture	0 to 55°C or -40 to 75°C	0 to 55°C		0 to 55°C		0 to 55°C or -40 to 75°C	
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-40 to 85°C	-40 to 85°C
Power Requirements							
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 30 VDC	9 to 30 VDC	12 to 48 VDC	12 to 48 VDC
Power Consumption @ 12/24/48 VDC	128.7/72/--- mA	200/106/--- mA	200/106/--- mA	180/100/--- mA	---/150/--- mA	325/190/--- mA	325/190/--- mA
Power Consumption @ 100/240 VAC	---	---	---	---	---	---	---
Regulatory Approvals							
EMC	CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A			CE (EN55022 Class B, EN55024 Class B), FCC Part 15 Subpart B		CE (EN55022 and EN55024 Class A), FCC Part 15 Subpart B Class A	
Safety	UL (UL60950-1), TÜV (EN60950-1)			UL (UL60950), TÜV (EN60950)		UL (UL60950-1), TÜV (EN60950-1)	
Marine	---	---	---	---	---	DNV	
Medical	---	---	---	---	EN60601-1-2 Class B, EN55011	---	---
Reliability							
Buzzer, RTC, WDT	WDT only	WDT only	WDT only	---	---	√	√
MTBF	279122 hrs	246505 hrs	246034 hrs	347822 hrs	225529 hrs	134850 hrs	106955 hrs
Warranty	5 years (see www.moxa.com/warranty)						

General-purpose Device Servers

	NPort® 5232 NPort® 5232-T	NPort® 5232I NPort® 5232I-T	NPort® 5410	NPort® 5430	NPort® 5430I	NPort® 5450	NPort® 5450I
Ethernet Interface							
10BaseT Ports	---	---	---	---	---	---	---
10/100BaseT(X) Ports	1	1	1	1	1	1	1
100BaseFX	---	---	---	---	---	---	---
Connector	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface							
RS-232 Ports	---	---	4	---	---	---	---
RS-232/422 Ports	2	2	---	4	4	---	---
RS-232/422/485 Ports	---	---	---	---	---	4	4
Connector	TB	TB	DB9-M	TB	TB	DB9-M	DB9-M
15 KV ESD Protection	√	√	√	√	√	√	√
2 KV Isolation Protection	---	√	---	---	√	---	√
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark						
Flow Control	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF
Baudrate	110 bps to 230.4 Kbps		50 bps to 921.6 Kbps				
Software							
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP		ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, Rtelnet, ARP				
Web Console	√	√	√	√	√	√	√
Serial Console	---	---	---	---	---	---	---
Telnet Console	√	√	√	√	√	√	√
Windows Utility	√	√	√	√	√	√	√
Windows Real COM Drivers	Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded						
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i						
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x						
Onsite Configuration							
Mini Screen with Push Buttons	---	---	√	√	√	√	√
Physical Characteristics							
Housing	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	360 g	380 g	740 g				
Dimensions	67 x 100.4 x 22 mm	67 x 100.4 x 35 mm	158 x 103 x 33 mm				
Environmental Limits							
Operating Temparture	0 to 55°C or -40 to 75°C		0 to 55°C (32 to 131°F)				
Operating Humidity	5 to 95% RH		5 to 95% RH				
Storage Temperature	-40 to 85°C		-20 to 70°C				
Power Requirements							
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Power Consumption @ 12/24/48 VDC	280/150/--- mA	509.4/200/--- mA	350/190/--- mA	320/175/--- mA	530/280/--- mA	350/190/--- mA	554/294/--- mA
Power Consumption @ 100/240 VAC	---	---	---	---	---	---	---
Regulatory Approvals							
EMC	CE (EN55022 and EN55024 Class A), FCC Part 15 Subpart B Class A						
Safety	UL (UL60950-1), TÜV (EN60950-1)						
Marine	DNV						
Medical	---	---	EN60601-1-2 Class B, EN55011				
Reliability							
Buzzer, RTC, WDT	√	√	√	√	√	√	√
MTBF	102344 hrs	87083 hrs	206903 hrs	206903 hrs	206903 hrs	206903 hrs	206903 hrs
Warranty	5 years (see www.moxa.com/warranty)						

General-purpose Device Servers

	NPort® 5610-8	NPort® 5610-8-48V	NPort® 5630-8	NPort® 5650-8	NPort® 5650-8-M-SC	NPort® 5650-8-S-SC	NPort® 5610-16	NPort® 5610-16-48V
Ethernet Interface								
10BaseT Ports	---	---	---	---	---	---	---	---
10/100BaseT(X) Ports	1	1	1	1	---	---	1	1
100BaseFX Ports	---	---	---	---	1 (multi-mode)	1 (single-mode)	---	---
Connector	RJ45	RJ45	RJ45	RJ45	SC	SC	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	---	---	1.5 KV	1.5 KV
Serial Interface								
RS-232 Ports	8	8	---	---	---	---	16	16
RS-232/422 Ports	---	---	8	---	---	---	---	---
RS-232/422/485 Ports	---	---	---	8	8	8	---	---
Connector	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
15 KV ESD Protection	√	√	√	√	√	√	√	√
2 KV Isolation Protection	---	---	---	---	---	---	---	---
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark							
Flow Control	RTS/CTS, XON/XOFF							
Baudrate	50 bps to 921.6 Kbps							
Software								
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, ARP, PPP, SLIP, RTelnet, RFC2217							
Web Console	√	√	√	√	√	√	√	√
Serial Console	---	---	---	---	---	---	---	---
Telnet Console	√	√	√	√	√	√	√	√
Windows Utility	√	√	√	√	√	√	√	√
Windows Real COM Drivers	Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded							
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i							
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x							
Onsite Configuration								
Mini Screen with Push Buttons	√	√	√	√	√	√	√	√
Physical Characteristics								
Housing	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	3340 g	3160 g	3380 g	3360 g	3380 g	3380 g	3420 g	3260 g
Dimensions	440 x 45 x 198 mm							
Environmental Limits								
Operating Temparture	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C
Power Requirements								
Input Voltage	100 to 240 VAC, 47 to 63 hz	±48 VDC	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	±48 VDC
Power Consumption @ 12/24/48 VDC		---/---/135 mA	---	---	---	---	---	---/---/135 mA
Power Consumption @ 100/240 VAC	141/93 mA	---	152/98 mA	158/102 mA	174/113 mA	164/110 mA	141/93 mA	---
Regulatory Approvals								
EMC	CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A, IEC61000-4-12		CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A				CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A, IEC61000-4-12	
Safety	UL (UL60950-1), TÜV (EN60950-1)							
Marine	---	---	---	---	---	---	---	---
Medical	EN60601-1-2 Class B, EN55011							
Reliability								
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√
MTBF	97294 hrs	96758 hrs	118405 hrs	117584 hrs	116914 hrs	116914 hrs	94928 hrs	94417 hrs
Warranty	5 years (see www.moxa.com/warranty)							

General-purpose Device Servers

	NPort® 5630-16	NPort® 5650-16	NPort® 5650-16-M-SC	NPort® 5650-16-S-SC	NPort® 5610-8-DT	NPort® 5610-8-DT-J	NPort® 5650-8-DT	NPort® 5650I-8-DT	NPort® 5650-8-DT-J
Ethernet Interface									
10BaseT Ports	---	---	---	---	---	---	---	---	---
10/100BaseT(X) Ports	1	1	---	---	2	2	2	2	2
100BaseFX Ports	---	---	1 (multi-mode)	1 (single-mode)	---	---	---	---	---
Connector	RJ45	RJ45	SC	SC	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	---	---	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface									
RS-232 Ports	---	---	---	---	8	8	---	---	---
RS-232/422 Ports	16	---	---	---	---	---	---	---	---
RS-232/422/485 Ports	---	16	16	16	---	---	8	8	8
Connector	RJ45	RJ45	RJ45	RJ45	DB9-M	RJ45	DB9-M	DB9-M	RJ45
15 KV ESD Protection	√	√	√	√	√	√	√	√	√
2 KV Isolation Protection	---	---	---	---	---	---	---	√	---
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	RTS/CTS, XON/XOFF								
Baudrate	50 bps to 921.6 Kbps								
Software									
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, ARP, PPP, SLIP, RTelnet, RFC2217				ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, Rtelnet, ARP, RFC2217				
Web Console	√	√	√	√	√	√	√	√	√
Serial Console	---	---	---	---	√	√	√	√	√
Telnet Console	√	√	√	√	√	√	√	√	√
Windows Utility	√	√	√	√	√	√	√	√	√
Windows Real COM Drivers	Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded								
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i								
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x								
Onsite Configuration									
Mini Screen with Push Buttons	√	√	√	√	√	√	√	√	√
Physical Characteristics									
Housing	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	3400 g	3460 g	3440 g	3440 g	1760 g	1170 g	1770 g	1850 g	1710 g
Dimensions	440 x 45 x 198 mm				197 x 44 x 135.5 mm				
Environmental Limits									
Operating Temparture	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C
Power Requirements									
Input Voltage	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Power Consumption @ 12/24/48 VDC	---	---	---	---	611/300/140 mA	611/300/140 mA	615/300/156 mA	1066/510/200 mA	615/300/156 mA
Power Consumption @ 100/240 VAC	152/98 mA	158/102 mA	174/113 mA	164/110 mA	---	---	---	---	---
Regulatory Approvals									
EMC	CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A				CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A				
Safety	UL (UL60950-1), TÜV (EN60950-1)								
Marine	---	---	---	---	---	---	---	---	---
Medical	EN60601-1-2 Class B, EN55011	EN60601-1-2 Class B, EN55011	EN60601-1-2 Class B, EN55011	EN60601-1-2 Class B, EN55011	---	---	---	---	---
Reliability									
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√	√
MTBF	91483 hrs	104767 hrs	87528 hrs	87528 hrs	163356 hrs	163356 hrs	163356 hrs	163356 hrs	163356 hrs
Warranty	5 years (see www.moxa.com/warranty)								

Industrial-grade Device Servers

	NPort® IA5150 NPort® IA5150-T	NPort® IA5150I NPort® IA5150I-T	NPort® IA5150-M-SC NPort® IA5150-M-SC-T	NPort® IA5150I-M-SC NPort® IA5150I-M-SC-T	NPort® IA5150-S-SC NPort® IA5150-S-SC-T	NPort® IA5150I-S-SC NPort® IA5150I-S-SC-T	NPort® IA5250 NPort® IA5250-T
Ethernet Interface							
10/100BaseT(X) Ports	2	2	---	---	---	---	2
100BaseFX Ports	---	---	1 (multi-mode)	1 (multi-mode)	1 (single-mode)	1 (single-mode)	---
Connector	RJ45	RJ45	SC	SC	SC	SC	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	---	---	---	---	1.5 KV
Serial Interface							
RS-232/422/485 Ports	1	1	1	1	1	1	2
Connector	DB9-M/TB	DB9-M/TB	DB9-M/TB	DB9-M/TB	DB9-M/TB	DB9-M/TB	DB9-M
15 KV ESD Protection	√	√	√	√	√	√	√
2 KV Isolation Protection	---	√	---	√	---	√	---
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark						
Flow Control	RTS/CTS, XON/XOFF						
Baudrate	110 bps to 230.4 Kbps						
Software							
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, Rtelnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP						
Configuration Options	Web Console, Serial Console, Telnet Console, Windows Utility						
Windows Real COM Drivers	Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded						
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i						
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x						
Physical Characteristics							
Housing	Plastic (IP30)						
Weight	360 g						
Dimensions	29 x 89.2 x 118.5 mm						
Environmental Limits							
Operating Temparture	0 to 55°C or -40 to 75°C						
Operating Humidity	5 to 95% RH						
Storage Temperature	-40 to 85°C						
Power Requirements							
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Power Consumption	360 mA @ 12 V, 195 mA @ 24 V	420 mA @ 12 V, 215 mA @ 24 V	500 mA @ 12 V, 250 mA @ 24 V	510 mA @ 12 V, 260 mA @ 24 V	470 mA @ 12 V, 210 mA @ 24 V	490 mA @ 12 V, 250 mA @ 24 V	440 mA @ 12 V, 200 mA @ 24 V
Regulatory Approvals							
EMC	CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A						
Safety	UL (UL60950-1), UL508, TÜV (EN60950-1)						
Hazardous Location	UL/cUL Class 1 Division 2 Groups A, B, C and D						
ATEX	Class I, Zone 2						
Marine	DNV						
EMS	EN61000-4-2 (ESD), Level 3; EN61000-4-3 (RS), Level 3; EN61000-4-4 (EFT), Level 4; EN61000-4-5 (Surge), Level 3; EN61000-4-6 (CS), Level 3; EN61000-4-8; EN61000-4-11; EN61000-4-12						
IEC	IEC60068-2-27 (Shock); IEC60068-2-32 (Freefall); IEC60068-2-6 (Vibration)						
Dust-proof	IP30	IP30	IP30	IP30	IP30	IP30	IP30
Reliability							
Buzzer, RTC, WDT	√	√	√	√	√	√	√
MTBF	183747 hrs	195614 hrs	183747 hrs	195614 hrs	183747 hrs	195614 hrs	194765 hrs
Warranty	5 years (see www.moxa.com/warranty)						

Embedded Device Servers

	MiiNePort E1 MiiNePort E1-T	NE-4110S	NE-4110A	NE-4120S	NE-4120A	NE-4100T	WE-2100T
Form Factor							
Type	Drop-in module	Ready-to-go stand-alone modules				26-pin dual-in-line package	Small metal housing
Dimensions	33.9 x 16.25 x 13.5 mm	57 × 40 mm	57 × 40 mm	57 × 40 mm	57 × 40 mm	45 × 36 mm	54 x 40 x 13.3 mm
Ethernet Interface							
10/100BaseT(X) Ports	1	1	1	1	1	1	1
Connector	RJ45	RJ45	RJ45	5-pin pin header		26-pin dual-in-line	44-pin dual-in-line
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
WLAN Interface							
Standard Compliance	---	---	---	---	---	---	IEEE 802.11a/b/g
Radio Frequency Type	---	---	---	---	---	---	DSSS, CCK, DFDM
Wireless Security	---	---	---	---	---	---	SEP, SPA, SPA2, 802.11i
Network Modes	---	---	---	---	---	---	Infrastructure (a/b/g), Ad Hoc (b/g)
Serial Interface							
TTL Ports	1 (data port)	1 (console port)				2 (1 data port, 1 console port)	
RS-232 Ports	---	1 (data port)	---	1 (data port)	---	---	---
RS-232/422 Ports	---	---	1 (data port)	---	1 (data port)	---	---
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark						
Flow Control	RTS/CTS, XON/XOFF						
Baudrate	50 bps to 230.4 Kbps* (supports non-standard baudrates)	110 bps to 230.4 Kbps					50 bps to 921.6 Kbps
Programmable GPIO Pins	3	4	4	4	4	4	---
Software							
Network Protocols	ICMP, IP, TCP, UDP, DHCP, Telnet, HTTP, SNMP V1/V2c, SMTP ARP, TFTP, Auto IP, BOOTP	ARP					DNS, SNTP, SSH, HTTPS
Configuration Options	Web/Serial/Telnet Console, Windows Utility						
Serial Command Mode	√	---	---	---	---	---	√
Windows Real COM Drivers	Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded						
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i						
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x						
Operation Modes	TCP Server, TCP Client, UDP, Real COM mode, Modem Mode, RFC2217	Real COM, TCP Server, TCP Client, UDP					Real COM, TCP Server, TCP Client, UDP, RFC2217
Environmental Limits							
Operating Temparture	0 to 55°C or -40 to 85°C	0 to 55°C or -40 to 75°C					0 to 55°C
Operating Humidity	5 to 95% RH						5 to 95% RH
Storage Temperature	-40 to 85°C	-20 to 70°C					-20 to 70°C
Power Requirements							
Input Voltage	3.3 VDC (±5%)	5 VDC (±5%)	5 VDC (±5%)	5 VDC (±5%)	5 VDC (±5%)	5 VDC (±5%)	3.3 VDC (±5%)
Power Consumption	160 mA @ 3.3 VDC max.	290 mA @ 5 VDC max.					540 mA (at full speed)
Regulatory Approvals							
EMC	EN55022:1998, Class B (radiated & conducted emissions); EN55024:1998 (direct & indirect ESD, electrical fast-transient/ burst immunity, power frequency magnetic field immunity)	CE (EN55022 Class A), FCC Part 15 Subpart B Class A					CE (EN55022 and EN55024 Class A, ETSI EN 301 489-17, ETSI EN 301 489-1)
Reliability							
Watchdog Timer	√	√	√	√	√	√	√
MTBF	---	290276 hrs	289573 hrs	289573 hrs	289573 hrs	288173 hrs	505288 hrs
Warranty	5 years (see www.moxa.com/warranty)						

* Baudrates up to 921.6 Kbps available by request

Introduction to Serial Device Servers

Device server technology makes device networking easy

Device servers are used to connect serial devices to Ethernet LANs, and are able to transmit data both to and from the serial device. Moxa's NPort® line of device servers are essentially pre-programmed computers that have a real-time OS and built-in TCP/IP protocol suite that allows you to access, manage, and configure remote facilities and equipment from anywhere in the world over the Internet.

No Restrictions on Host Type or Operating System

Any host computer that supports the TCP/IP protocol can access the NPort®'s serial ports, eliminating the need for special-purpose drivers. In addition, you will not be held back by your PC's limited number of serial bus slots.

Real COM/TTY Drivers for Existing Software

NPort® device servers also come with Real COM/TTY drivers for accessing devices through a "virtual" COM or TTY port.

Serial Device Server Selection Table

Number of Serial Ports	General-purpose Device Servers			Device Servers with Optical Isolation	Device Servers for Wide Temperature Applications
	RS-232	RS-422/485	RS-232/422/485		
1	NPort® 5110	NPort® 5130	NPort® DE-211 NPort® DE-311 NPort® 5150 NPort® IA5150 NPort® IA5150-M-SC NPort® IA5150-S-SC	NPort® IA5150I NPort® IA5150I-M-SC NPort® IA5150I-S-SC	NPort® 5110-T NPort® IA5150-T NPort® IA5150I-T NPort® IA5150-M-SC-T NPort® IA5150-S-SC-T NPort® IA5150I-M-SC-T NPort® IA5150I-S-SC-T
2	NPort® 5210	NPort® 5232	NPort® 5230 NPort® IA5250	NPort® 5232I	NPort® 5210-T NPort® 5230-T NPort® 5232-T NPort® IA5250-T NPort® 5232I-T
4	NPort® 5410	NPort® 5430	NPort® 5450	NPort® 5430I NPort® 5450I	---
8	NPort® 5610-8 NPort® 5610-8-48V NPort® 5610-8-DT NPort® 5610-8-DT-J	NPort® 5630-8	NPort® 5650-8 NPort® 5650-8-M-SC NPort® 5650-8-S-SC NPort® 5650-8-DT NPort® 5650-8-DT-J	NPort® 5650I-8-DT	---
16	NPort® 5610-16 NPort® 5610-16-48V	NPort® 5630-16	NPort® 5650-16 NPort® 5650-16-M-SC NPort® 5650-16-S-SC	---	---

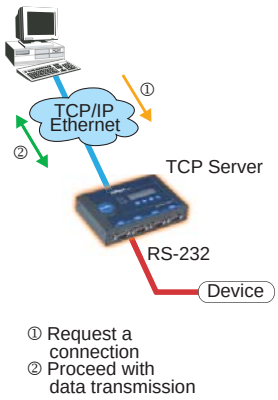
Note: See Chapter 7, "Terminal Servers," for information about our NPort® 6000 series and CN2600 series of serial-to-Ethernet terminal servers.

NPort® Provides a Choice of Operation Modes

Socket Modes

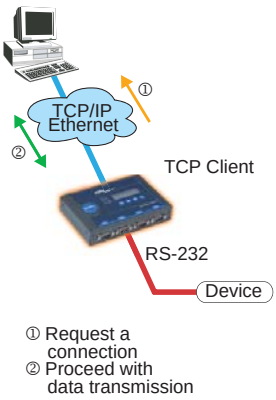
TCP Server Mode

When the NPort® is configured for TCP Server Mode, each serial port is assigned a unique IP:Port combination on the TCP/IP network, and the NPort® waits passively for a host computer to establish a connection with the attached serial device. TCP Server mode supports up to 4 simultaneous connections, allowing multiple hosts to collect data from the same serial device at the same time.



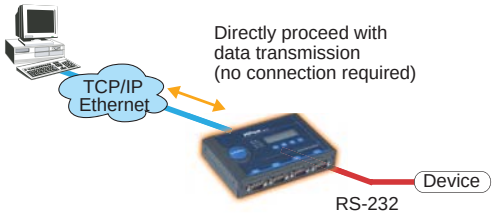
TCP Client Mode

When the NPort® is configured for TCP Client mode, the NPort® establishes a TCP connection between the attached device and a specified host computer when data is received from the attached device. After the data has been transferred, the NPort® automatically closes the connection. TCP Client mode supports up to 4 simultaneous connections, allowing multiple hosts to collect data from the same serial device at the same time.



UDP Mode

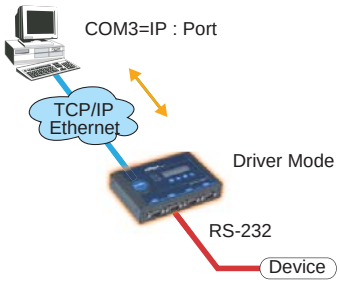
UDP mode supports up to 4 IP groups. In UDP mode, the attached device can exchange data simultaneously with up to 4 network destinations, and at a higher speed than when using TCP. This mode is ideal for message display applications.



Driver Modes

Real COM Mode

When configured for Real COM mode, each serial port is assigned an IP:Port combination that is mapped to a host computer's local COM or TTY port using Moxa's NPort® drivers. Legacy applications can access the attached serial device using the host's local COM or TTY port, without the need to modify serial COM software to account for network protocols.



RFC2217 Mode

When the NPort® is configured for RFC2217 mode, each serial port is assigned an IP:Port combination that is mapped by RFC2217-compliant drivers to a virtual COM port. The RFC2217 protocol defines general COM port control options based on the Telnet protocol. The NPort® supports any third party driver that is RFC2217-compliant.

Other Modes

Pair Connection Mode

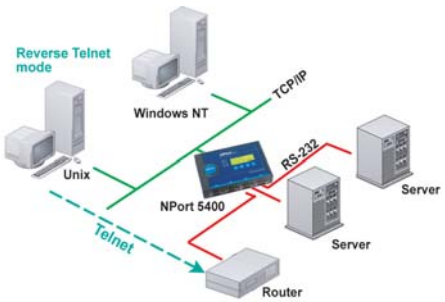
When configured for Pair Connection mode, two NPort® device servers can be used to transmit RS-232 signals over Ethernet, and in this way overcome the 15-meter limitation imposed by the RS-232 standard. One NPort® connects to the PC's COM port, and the other NPort® connects to the serial device. The two NPort® device servers are either connected to each other with a cross-over Ethernet cable, or are each connected to an Ethernet LAN or WAN. Both data and modem control signals can be exchanged between the PC and device over Ethernet, but DCD signals are not supported.

Ethernet Modem Mode

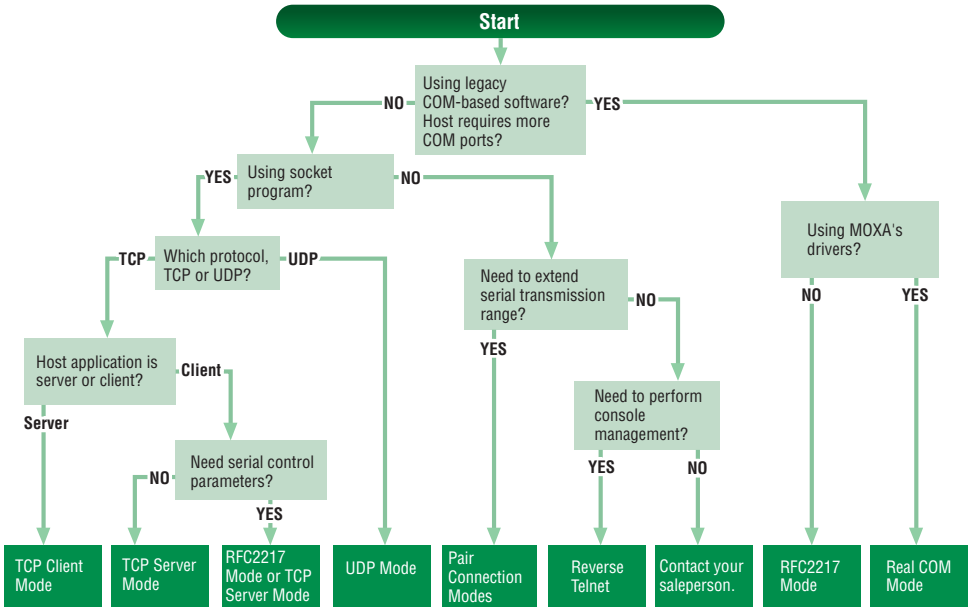
When configured for Ethernet Modem mode, the serial port on the NPort® behaves as if it were attached to a modem, except that data is transmitted over a network instead of over phone lines. Ethernet Modem Mode enables network access for legacy software that was originally designed to transmit data by modem.

Reverse Telnet Mode

When configured for Reverse Telnet mode, the NPort® device server's serial ports provide a connection to a server, with connections initiated by a host over Ethernet. This is similar to TCP server mode, except that Reverse Telnet mode also provides Telnet-style CR/LF conversion. Reverse Telnet mode can be used for remote console management, in which the NPort® is used to enable network access to the serial console ports of different equipment, such as routers, switches, and servers.



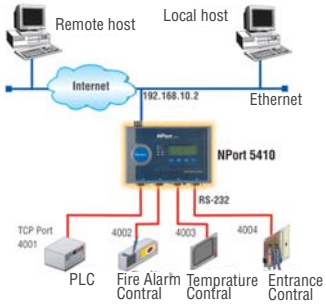
Mode Selection Flowchart



Typical Applications

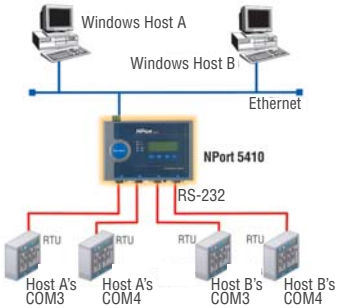
Use only one IP address to control multiple serial devices over the network

Automatic or remote data acquisition can be accomplished with NPort® 5000 device servers, which only require one IP address to connect up to 16 serial devices to an Ethernet network. By specifying the IP address and TCP port number, a host computer can access the serial devices connected to the NPort® 5000 from over the network. In the example shown here, data from the NPort® 5410's first serial port can be obtained by connecting to 192.168.10.2:4001.



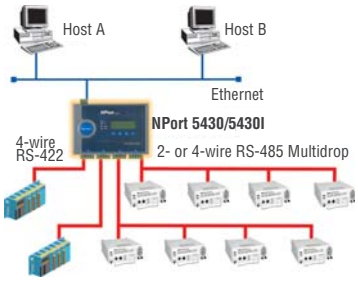
Use server sharing from a central location for greater device management flexibility

Serial devices connected to the NPort® 5000 device server can communicate over the network with more than one host computer.



Centralize RS-422/485 serial device control

Up to 31 RS-485 devices, or 9 RS-422 devices, can be connected to each serial port on the NPort® 5000 device server. The web console or Windows utility can be used to configure RS-422 or RS-485 operation for each port, with both 2-wire and 4-wire RS-485 supported.

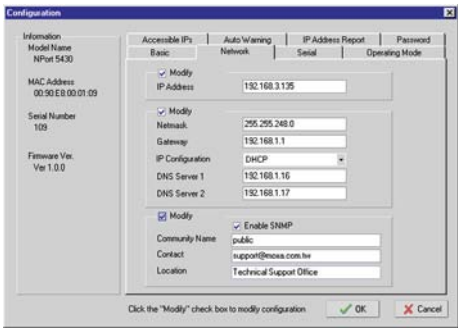


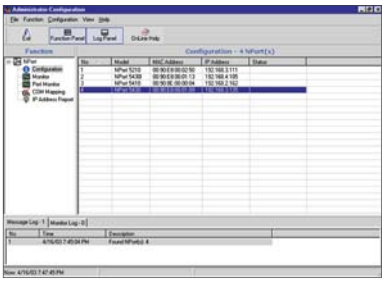
NPort® Administrator Makes Installation Easy

NPort® Administrator is designed to make it easy to install and configure NPort® 5000 device servers over the network. Five groups of functions are supported to allow off-line COM mapping, device monitoring, and searching for NPort® device severs over the network. Both NPort® Administrator and an IP Serial Library are bundled with NPort®'s integrated software suite, giving you everything you need to manage, monitor, and reconfigure your NPort® from remote locations.

Configuration Features

- Broadcast search over the LAN for NPort® device servers
- Select and configure the NPort®'s operation mode
- Upgrade the NPort®'s firmware
- Export and import the NPort's configurations
- Monitor the NPort's status
- Auto IP report





Web Console Provides Exceptional Convenience

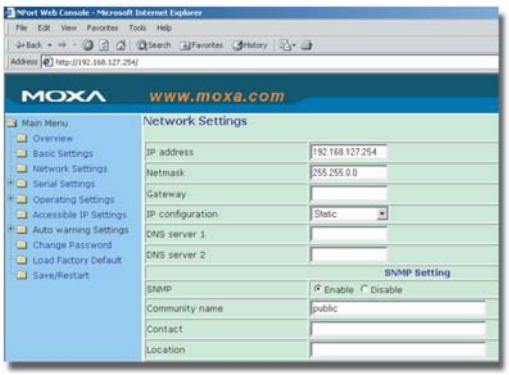
NPort® 5000 device servers are easily configured over the network with the web console or Telnet console.

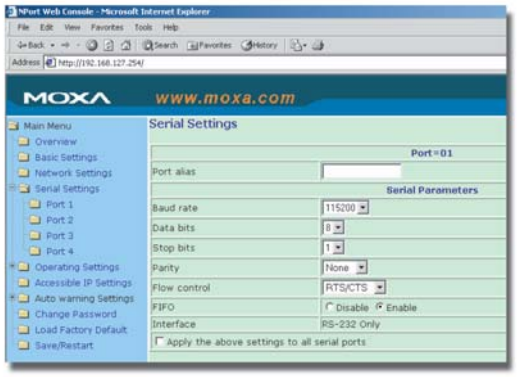
Network Settings

- IP, netmask, gateway
- Static IP, DHCP, BOOTP
- DNS server

Serial Settings

- Baudrate
- Data bits, stop bit, parity
- Flow control
- Communication interface





Operation Settings

- Operation mode
- TCP alive check time
- Inactivity time
- Delimiter
- Force transmit
- Packet length
- Allow driver control
- Maximum connection

IP Serial Library

What is IP Serial Library?

The IP Serial Library is a collection of Windows functions for NPort® 5000 device servers. Serial command sets and common subroutines are provided. The purpose of the library is to help reduce complexity and increase efficiency when programming serial communication applications that run over a TCP/IP network. For example, Telnet is limited because it can only transfer data but cannot monitor or configure serial line parameters. The IP Serial Library can be used to add new functionality to your Telnet sessions.

Use IP Serial Library for easier socket-based serial COM programming

For programmers who are familiar with serial communication, the IP Serial Library provides well-designed function calls that have the same style as Moxa's PComm Library.

The IP Serial Library is amazingly simple and easy to understand. By including the library in your VB, C, or Delphi programming environment, you will be able to develop TCP/IP applications that can control serial communication parameters.

When Real COM mode is used, the NPort® serial device servers use two TCP ports for communication between an attached device and a host computer's Real COM driver. The two ports, a data port and a command port, provide pure data transfer without requiring encoding and decoding. With the IP Serial Library, only one port is used to communicate with a user's application, and no encoding or decoding is required.

IP Serial Library Example

```
char NPortip="192.168.1.10";
char buffer[255];int port = 1;        /*data buffer, 255 chars */
int portid;        /*port handle*/
nsio_init();        /*initialize IP Serial Library*/
portid = nsio_open(NPortip, port);        /*1st port, NPort IP=192.168.1.10 */
nsio_ioctl(portid, B9600, (BIT_8 | STOP_1 | P_NONE) );        /*set 9600, N81 */
sleep(1000);        /* wait for 1000 ms for data */
nsio_read(port, buffer, 200);        /* read 200 bytes from port 1 */
nsio_close(portid);        /* clost this serial port */
nsio_end();        /* close IP Serial Library */
```

IP Serial API Function List

Server Control	Port Control	Input/Output Data	Port Status Inquiry	Miscellaneous
nsio_init	nsio_open	nsio_read	nsio_lstatus	nsio_break
nsio_end	nsio_close	nsio_SetReadTimeouts	nsio_data_status	nsio_break_on
nsio_resetserver	nsio_ioctl	nsio_write	---	nsio_break_off
nsio_checkalive	nsio_fl owctrl	nsio_SetWriteTimeouts	---	nsio_breakcount
---	nsio_DTR	---	---	---
---	nsio_RTS	---	---	---
---	nsio_lctrl	---	---	---
---	nsio_baud	---	---	---
---	nsio_resetport	---	---	---

CASE STUDY

Power Generation

Remote Monitoring and Control of a Windmill Generator

As concerns over global warming continue to grow, green technologies are becoming increasingly popular. Wind turbine companies provide an excellent alternative to burning fossil fuels by harnessing kinetic energy from the wind and converting it into electricity. A typical wind farm may include over 80 wind turbines, so maintaining efficient and reliable networks to manage and control these installations is imperative.

Each wind turbine includes a generator and a variety of serial components such as a water cooler, high voltage transformer, ultrasonic wind sensors, yaw gear, blade bearing, pitch cylinder, and hub controller. All of these components are controlled by a PLC and communicate with the host on the ground. Due to the total integration of these devices into an Ethernet network, one of our customers in the wind turbine industry needed a serial-to-Ethernet solution that can operate reliably for years without interruption.

Application Requirements

- Must be able to connect with many serial devices, with total integration of the devices into an Ethernet network.
- The system must exhibit high reliability and performance, and be easy to maintain.

Why Moxa?

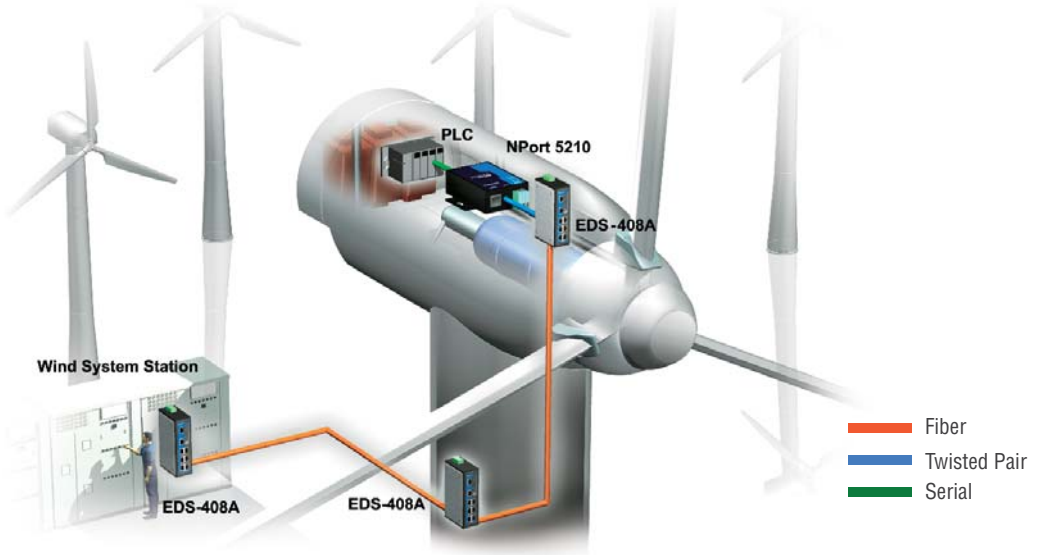
- Long MTBF with high reliability and effective system maintenance
- Small size for easy configuration
- High performance serial-to-Ethernet solution

Key Products

- Small size for easy installation
- Versatile socket operation modes, including TCP Server, TCP Client, and UDP
- Easy-to-use Windows utility for configuring multiple device servers
- Supports 10/100M Ethernet
- Patented ADDC® (Automatic Data Direction Control) for 2-wire and 4-wire RS-485
- Built-in 15 KV ESD protection for all serial signals
- SNMP MIB-II for network management

NPort® 5130

Application Topology



CASE STUDY

Automatic Meter Reading

Automatic Meter Reading for a Centralized Power Meter Application

Automated meter reading (AMR) technology automatically collects data from devices such as electricity, water, and gas meters, and transfers that data to a central database for billing or analysis.

A particular tower in the Middle East has a large number of devices and communication media on each floor. In addition, the control room needs to gather and monitor a great deal of information, including security alarm signals, air conditioner controls, signal controls, and power meters. However, there was insufficient space to install serial communication wiring to connect the power meters to the control room. Since an Ethernet network was already installed, the client wanted a solution that satisfied the following requirements:

- Data transmission from each group of power meters to the control room
- Additional wiring space must be kept to a minimum
- Only a limited number of public IP addresses could be used for the entire building

Application Requirements

- Use the existing Ethernet infrastructure to transmit power meter data
- Use NPort® 5130 device servers to connect power meters over RS-485

Why Moxa?

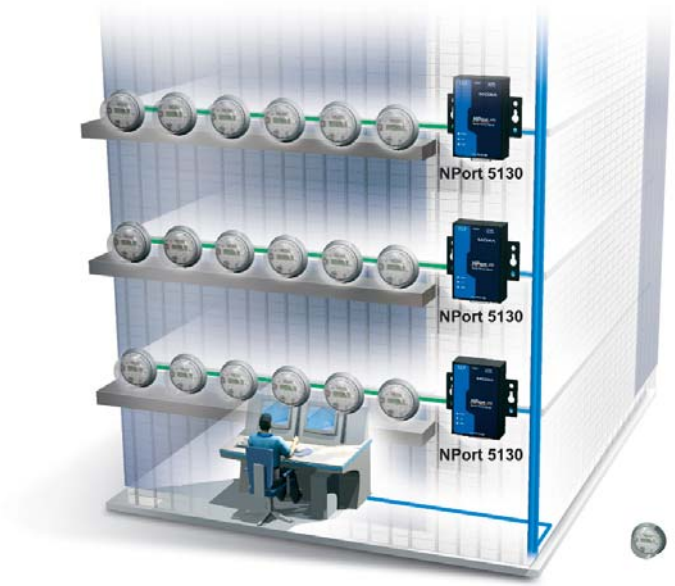
- The NPort® 5130 offers an effective serial-to-Ethernet solution for data transmission
- Do not need to spend additional effort and cost for wiring

Key Products

NPort® 5130

- Real COM/TTY drivers for Windows and Linux
- Standard TCP/IP interface and versatile operation modes
- Easy-to-use Windows utility for configuring multiple device servers
- Built-in 15 KV ESD protection for all serial signals
- SNMP MIB-II for network management
- Configure by Telnet or web browser
- Adjustable termination resistor for RS-485 ports

Application Topology



NPort® S8000 Series

Combo switch / serial device server

NPort S8455I-MM-SC

> **4-port RS-232/422/RS-485 serial device server**
- Serial QoS for configuring serial data transmission priority
- 2 KV (DC) isolation protection for each serial port
- Adjustable pull high/low resistor for RS-485 ports

> **5-port managed Ethernet switch built in**
- Two fiber Ethernet ports and three Ethernet ports
- Ethernet redundancy with Turbo Ring® (recovery time < 20 ms) or RSTP/STP (IEEE 802.1w/D) supported
- QoS, IGMP-snooping/GMRP, VLAN, LACP, SNMPv1/v2c/v3, RMON supported
- Surge protection for serial, power, and Ethernet

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The first model available from the NPort® S8000 series is the NPort® S8455I-MM-SC, which combines an industrial device server with a full-function managed Ethernet switch. The NPort® S8455I-MM-SC integrates 2 fiber ports, 3 Ethernet ports, and 4 RS-232/422/485 serial ports, allowing you to save space in your cabinet, reduce your overall power consumption, and reduce your costs since you will not need to purchase separate switch and serial device server products.

Supports all NPort® 5000 Series Device Server Functions

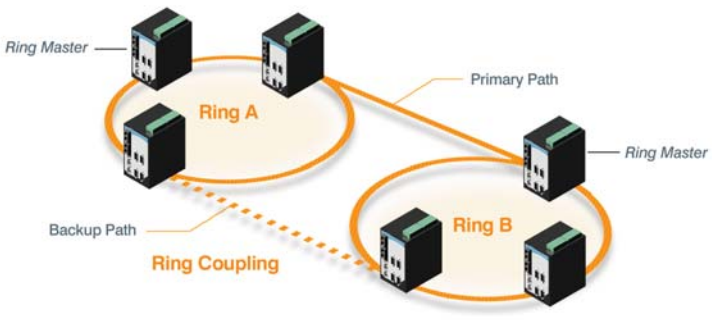
The NPort® S8455I-MM-SC supports the complete array of NPort® 5000 series device server functions. Network your existing serial devices by connecting up to 4 serial devices through each of the 5 Ethernet ports, with only basic configuration required. Data transmission between the serial and Ethernet interfaces is bi-directional.

Full-function Managed Ethernet Switch

The NPort® S8455I-MM-SC has a built-in full-function managed Ethernet switch that supports QoS, IGMP-snooping/GMRP, VLAN, Port Trunking, SNMPv1/v2c/v3, and IEEE 802.1X, allowing you to handle virtually any kind of application. Ethernet redundancy, which is used to increase the reliability and availability of your industrial Ethernet network, is provided by Moxa's own Turbo Ring® technology (recovery time < 20 ms) or RSTP/STP (IEEE 802.1w/D).

Couple Several Turbo Rings for Distributed Applications

For some systems, it may not be convenient to connect all devices in the system to create one BIG redundant ring, since some devices could be located at a remote site. The NPort® S8455I-MM-SC supports Turbo Ring's "Ring Coupling" function, which allows you to separate distributed devices into different smaller redundant rings, without a control line, and in such a way that the smaller rings will still be able to communicate with each other.



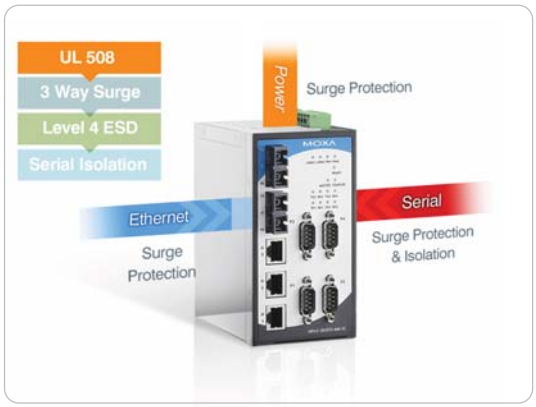
Rugged Design with Complete Protection

> **UL508 safety**
To meet customers' critical application requirements, the NPort® S8455I-MM-SC has been certified to meet the UL 508 national and international standard. The UL 508 standard covers the safety requirements for industrial control equipment.

> **3-way surge protection**
The NPort® S8455I-MM-SC is equipped with a surge protector for power, Ethernet interface, and serial interface for protection against voltage spikes.

> **Level 4 ESD**
The NPort® S8455I-MM-SC supports high level, 8/15 KV, ESD protection to avoid damage from static electricity.

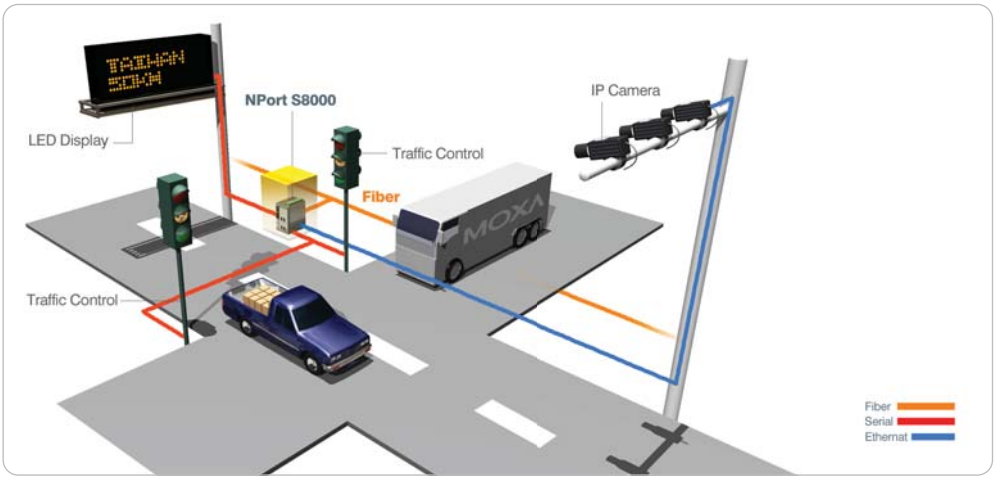
> **2 KV Serial Isolation**
Each serial port is protected by 2 KV of isolation against harmful currents from high voltages caused by a difference in ground potential between points in a communications system.



Typical Applications

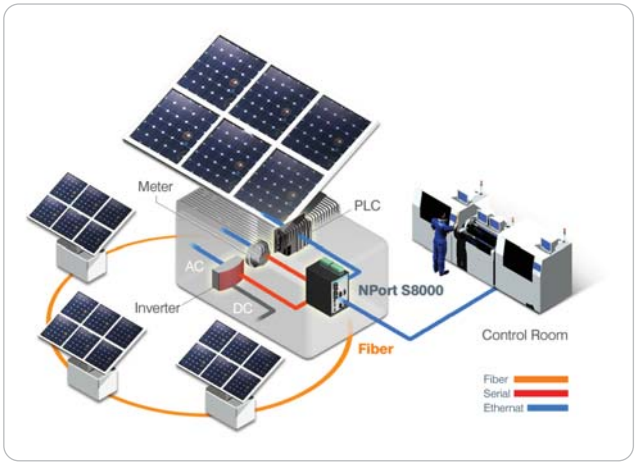
Roadway Traffic Monitoring and Control

Intelligent transportation systems (ITS) are playing a major role in modern transportation construction, with ITS technology applied to roadway traffic control systems. In general, ITS involves integrating communication, control, and electronics technologies, and is used to monitor and manage traffic flow, reduce congestion, provide alternative routes to travelers, and enhance productivity to save lives, time, and money. Traffic monitoring and control systems are usually housed in a small cabinet located by the roadside or at an intersection. Such systems usually include a camera for monitoring traffic, a traffic light control system, as well as other devices. The NPort S8455I-MM-SC is the best choice for traffic monitoring and control applications, since the compact size and all-in-one switch/device-server design saves a significant amount of space in a small cabinet.



Solar Power Station

All solar power stations include three major devices—a power inverter, a PLC, and meters. The power inverter converts the energy generated by the plant into the power that is transmitted to end-users. The PLC controls the sun tracking system of the base. These devices are often serial devices, although some may be Ethernet-ready. Now you can connect all of these Ethernet and serial devices to the control center easily and economically with one With the NPort® S8455I-MM-SC. The Ethernet redundancy function and ring structure increase the reliability and availability of the system. The NPort® S8000 series is definitely the best solution for this type of solar power system.



Appearance

General Specifications

Port Summary

Serial Ports: 4 RS-232/422/485 ports

Ethernet Switch Ports: 3 RJ45 copper ports, 2 multi-mode fiber ports

Console Ports: 1 (8-pin RJ45 connector)

LED Indicators: PWR1, PWR2, READY, MASTER, COUPLER, LINK4, LINK5

Physical Characteristics

Housing: Metal

Weight: 995 g

Dimensions: 73.1 x 134 x 105 mm (2.88 x 5.27 x 4.13 in)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 935mA @ 12 V, 470 mA @ 24 V

Regulatory Approvals

EMC: FCC Class A, CE Class A

Safety: UL-508

EMS:
IEC 61000-4-2, Level 4 (ESD)
IEC 61000-4-4, Level 4 (EFT)
IEC 61000-4-5 for serial port, Level 1 (Surge)
IEC 61000-4-5 for LAN port, Level 2 (Surge)
IEC 61000-4-5 for Power Line, Level 3 (Surge)

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Device Server Specifications

Serial Interface

Number of Ports: 4

Serial Standards: RS-232/422/485

Connectors: DB9 male

Serial Line Protection:
15 KV ESD protection for all signals
2 KV isolation protection

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Terminator for RS-485: 55 Ω, 120 Ω

Console Port: Dedicated RS-232 console port (8-pin RJ45)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS and XON/XOFF

Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

RS-485-2w: Data+, Data-, GND

Software

Configuration Options: Web Console, Telnet Console, Serial Console, Windows Search Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Operation Modes: Real COM, TCP Server, TCP Client, UDP, RFC2217

Management: SNMP MIB-II

IP Routing: Static, RIP-I, RIP-II

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Ethernet Switch Specifications

Ethernet Interface

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Network Protocols: ICMP, IP, TCP, UDP, ARP, Telnet, DNS, HTTP, SMTP, SNTP, IGMPv1/v2 device, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 82, BootP, TFTP, SNTP, SMTP, RARP, GMRP, LACP, RMON

MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control interface

Optical Fiber Interface

Type: Multi-mode

Distance: 0 to 2 km, 1310 nm (62.5/125 µm, 500 MHz*km)

Min. TX Output: -20 dBm

Max. TX Output: -14 dBm

Sensitivity: -34 to -30 dBm

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

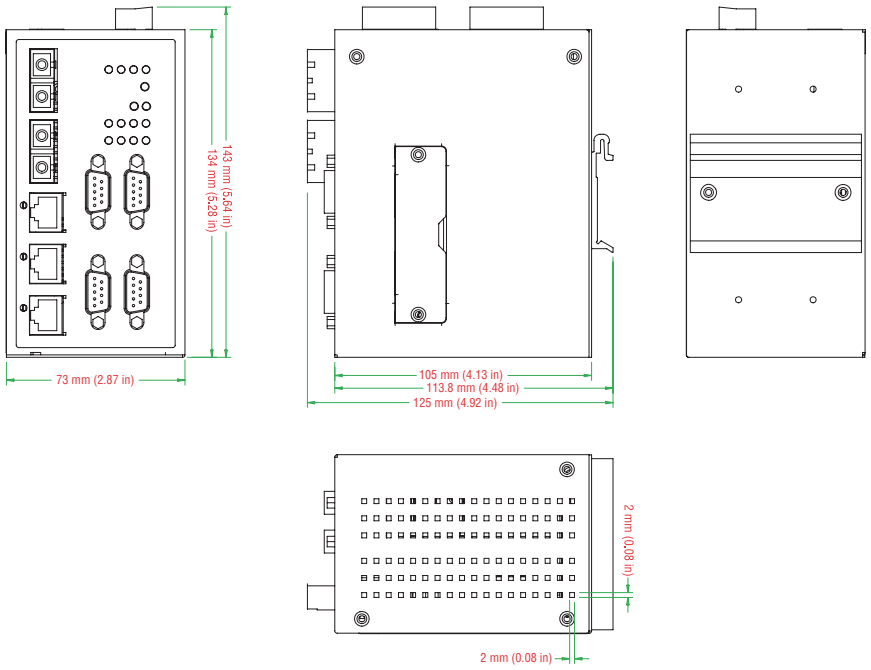
Switch Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

DIP Switches: Turbo Ring, Master, Coupler, Reserve

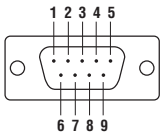
Alarm Contact: 2 relay outputs with current carrying capacity of 1A @ 24 VDC

Dimensions



Pin Assignment

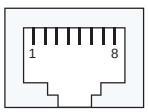
DB9 male connector



Serial Port (DB9 male connector)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

8-pin RJ45 connector



Console Port (RJ45)

PIN	RS-232
1	DSR
2	RTS
3	GND
4	TxD
5	RxD
6	DCD
7	CTS
8	RTS

Ethernet Port (RJ45)

PIN	Signal
1	RXD+
2	RXD-
3	TXD+
4	---
5	---
6	TXD-
7	
8	

Ordering Information

Available Models

NPort S8455I-MM-SC: 5-port Ethernet switch and 4-port serial device server combo

Package Checklist

- NPort S8455I-MM-SC
- Two power jack to TB power cables
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

NPort® 5100 Series

1-port RS-232/422/485 serial device servers

- Real COM/TTY drivers for Windows and Linux
- Standard TCP/IP interface and versatile operation modes
- Easy-to-use Windows utility for configuring multiple device servers
- Built-in 15 KV ESD protection for all serial signals
- SNMP MIB-II for network management
- Configure by Telnet or web browser
- Adjustable termination resistor for RS-485 ports

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

NPort® 5100 device servers are designed to make serial devices network-ready in an instant. The small size of the servers makes them ideal for connecting devices such as card readers and payment terminals to an IP-based Ethernet LAN. Use the NPort® 5100 device servers to give your PC software direct access to serial devices from anywhere on the network.

Most Cost-effective Serial-to-Ethernet Solution

Using serial device servers to connect legacy serial devices to Ethernet is now commonplace, and users expect device servers to be cost-effective and to provide a broad selection of useful functions. With their full support of Microsoft and Linux operating systems and solid 5-year warranty, the NPort® 5100 series device servers provide the best choice for serial-to-Ethernet converters.

Standard TCP/IP Interface and Broad Choice of Operation Modes

The NPort® 5100 device servers can be configured for TCP Server, TCP Client, UDP Server/Client, Pair Connection, or Ethernet Modem mode, ensuring compatibility with software based on a standard network API (e.g., Winsock or BSD Sockets).

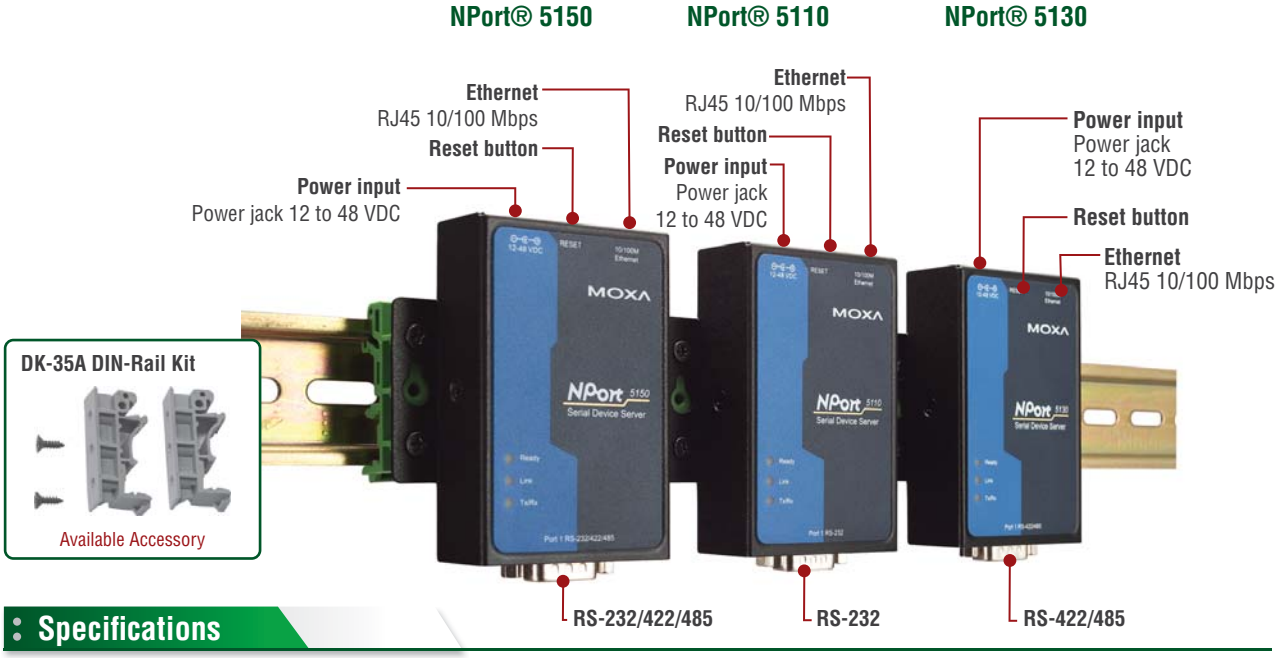
Real COM/TTY Drivers for Existing Software

The Real COM/TTY drivers provided with the NPort® 5100 device servers allow you to continue using software designed for communicating through COM/TTY ports. Installation and configuration is painless, and allows your serial devices and PC to communicate seamlessly over a TCP/IP network. Using Moxa's Real COM/TTY drivers is an excellent way to preserve your software investment, while still allowing you to enjoy the benefits of networking your serial devices.

Easy to Troubleshoot

NPort® 5100 device servers support SNMP V2, which can be used to monitor all units over Ethernet. Each unit can be configured to send trap messages automatically to the SNMP manager when user-defined errors are encountered. For users who do not use SNMP manager, an e-mail alert can be sent instead. Users can define the trigger for the alerts using Moxa's Windows utility, or the web console. For example, alerts can be triggered by a warm start, a cold start, or a change in password.

Appearance



Specifications

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 1

Serial Standards:
NPort® 5110: RS-232
NPort® 5130: RS-422/485
NPort® 5150: RS-232/422/485

Connector: DB9 male

Serial Line Protection: 15 KV ESD protection for all signals

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF

Baudrate:
NPort® 5110: 110 bps to 230.4 Kbps
NPort® 5130/5150: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP

Configuration Options: Web Console, Serial Console (NPort 5110/5150 only), Telnet Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Physical Characteristics

Housing: Metal

Weight: 340 g

Dimensions:
Without ears: 52 x 80 x 22 mm (2.05 x 3.15 x 0.87 in)
With ears: 75.2 x 80 x 22 mm (2.96 x 3.15 x 0.87 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-4 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
NPort® 5110: 128.7 mA @ 12 V, 72 mA @ 24 V
NPort® 5130/5150: 200 mA @ 12 V, 106 mA @ 24 V

Regulatory Approvals

EMC: CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A

Safety: UL (UL60950-1), TÜV (EN60950-1)

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (meantime between failures):
NPort® 5110: 279122 hrs
NPort® 5130: 246505 hrs
NPort® 5150: 246034 hrs

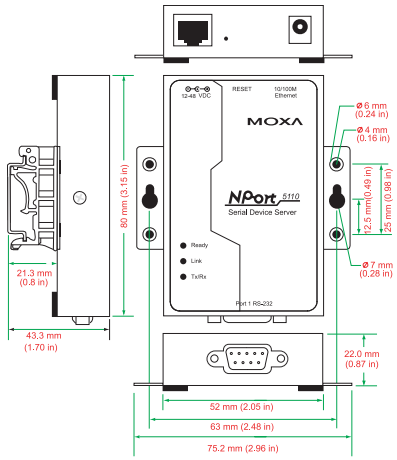
Warranty

Warranty Period: 5 years

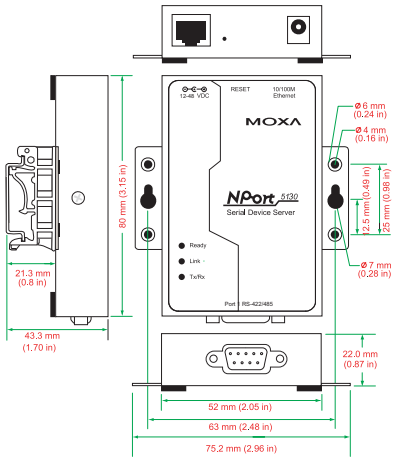
Details: See www.moxa.com/warranty

Dimensions

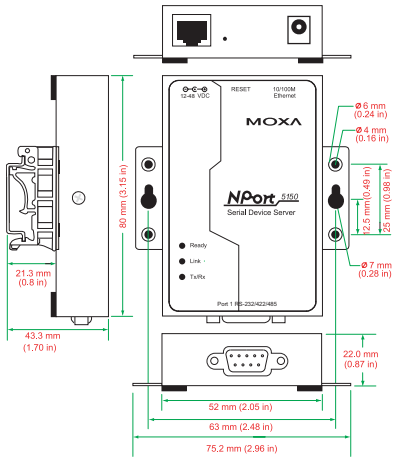
NPort® 5110



NPort® 5130

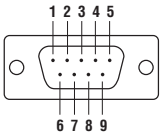


NPort® 5150



Pin Assignment

DB9 male connector



NPort® 5110 (RS-232)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

NPort® 5130 (RS-422/485)

PIN	RS-422/485-4w	RS-485-2w
1	TxD-(A)	–
2	TxD+(B)	–
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND
6	–	–
7	–	–
8	–	–

NPort® 5150 (RS-232/422/485)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Ordering Information

Available Models

NPort® 5110: 1-port RS-232 device server, 0 to 55°C operating temperature
NPort® 5130: 1-port RS-422/485 device server, 0 to 55°C operating temperature
NPort® 5150: 1-port RS-232/422/485 device server, 0 to 55°C operating temperature
NPort® 5110-T: 1-port RS-232 device server, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail

Package Checklist

- NPort® 5100 series device server
- Power Adaptor (only for non-T models)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

NPort® DE-211/311

1-port RS-232/422/485 serial device servers

NPort® DE-311

NPort® DE-211

- 3-in-1 serial port: RS-232, RS-422, or RS-485
- Versatile operation modes, including TCP Server, TCP Client, UDP, Ethernet Modem, and Pair Connection
- Real COM/TTY drivers for Windows and Linux
- 10M and 100M Ethernet speeds detected automatically
- 2-wire RS-485 with patented Automatic Data Direction Control (ADDC®)
- Built-in 15 KV ESD protection for all serial signals

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The NPort® DE-211 and DE-311 are 1-port serial device servers that support RS-232, RS-422, 4-wire RS-485, and 2-wire RS-485. The DE-211 supports 10 Mbps Ethernet connections and has a DB25 female connector for the serial port. The DE-311 supports 10/100 Mbps Ethernet connections and has a DB9 female connector for the serial port.

Both device servers are ideal for applications that involve information display boards, PLCs, flow meters, gas meters, CNC machines, and biometric identification card readers.

Specifications

Ethernet Interface

Number of Ports: 1

Speed:
NPort® DE-211: 10 Mbps, auto MDI/MDIX
NPort® DE-311: 10/100 Mbps, auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 1

Serial Standards: RS-232/422/485 (selectable by DIP Switch)

Connector:
NPort® DE-211: DB25 female
NPort® DE-311: DB9 female

Serial Line Protection: 15 KV ESD protection for all signals

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF

Baudrate: 50 bps to 230.4 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, RTS+, RTS-, CTS+, CTS-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND (DE-211 only)

RS-485-2w: Data+, Data-, GND

Software

Network Protocols: DHCP, BOOTP, Telnet, TCP, UDP, IP, ICMP, ARP

Configuration Options: Serial Console, Telnet Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Physical Characteristics

Housing: Metal, IP30 protection

Weight: 480 g

Dimensions:
Without ears: 67 x 100.4 x 22 mm (2.64 x 3.95 x 0.87 in)
With ears: 90.2 x 100.4 x 22 mm (3.55 x 3.95 x 0.87 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage:
DE-211: 12 to 30 VDC
DE-311: 9 to 30 VDC

Power Consumption:
NPort® DE-211: 180 mA @ 12 V, 100 mA @ 24 V
NPort® DE-311: 300 mA @ 9 V, 150 mA @ 24 V

Regulatory Approvals

EMC: CE (EN55022 Class B, EN55024 Class B), FCC Part 15 Subpart B

Safety: UL (UL60950), TÜV (EN60950)

Medical: EN60601-1-2 Class B, EN55011 (DE-311 only)

MTBF (meantime between failures):
NPort DE-211: 347822 hrs
NPort DE-311: 225529 hrs

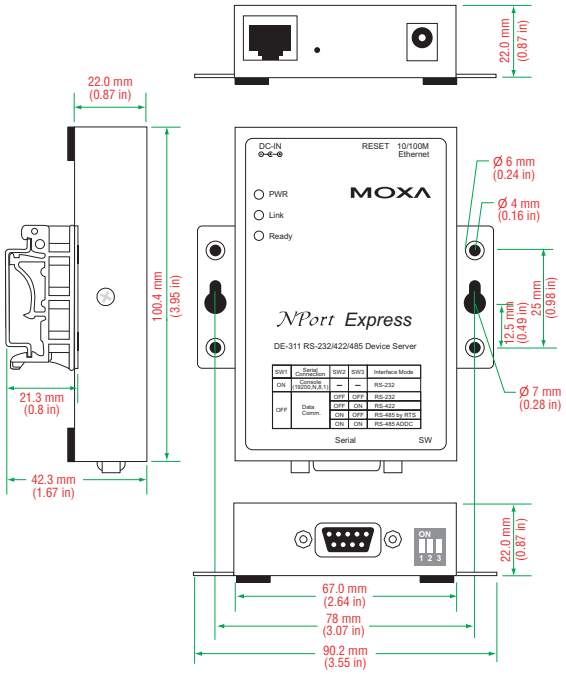
Warranty

Warranty Period: 5 years

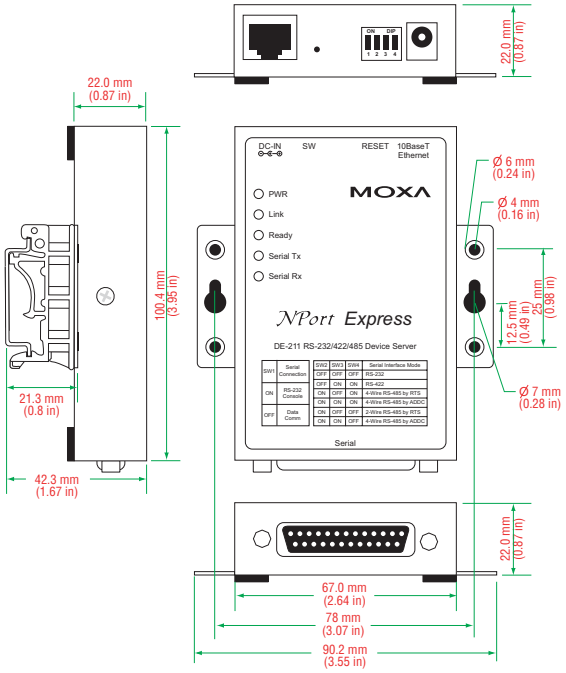
Details: See www.moxa.com/warranty

Dimensions

NPort® DE-311

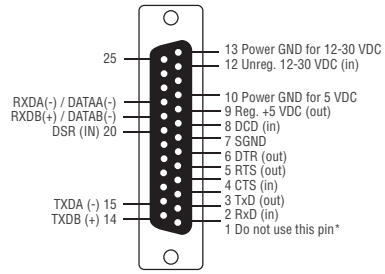


NPort® DE-211

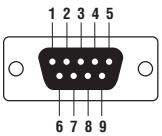


Pin Assignment

NPort® DE-211
(RS-232/422/485, DB25 female connector)



NPort® DE-311
(RS-232/422/485, DB9 female connector)



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	RxD-(A)	----
2	TxD	RxD+(B)	----
3	RxD	TxD+(B)	Data+(B)
4	DSR	TxD-(A)	Data-(A)
5	GND	GND	GND
6	DTR	CTS-(A)	----
7	CTS	CTS+(B)	----
8	RTS	RTS+(B)	----
9	----	RTS-(A)	----

Ordering Information

Available Models

NPort® DE-211: 1-port RS-232/422/485 device server with 10 Mbps Ethernet connection
NPort® DE-311: 1-port RS-232/422/485 device server with 10/100 Mbps Ethernet connection

Optional Accessories (can be purchased separately)

NP21101: DB25 male to DB9 female cable for RS-232 transmission, 30 cm (for DE-211)
NP21102: DB25 male to DB9 male cable for RS-232 transmission, 30 cm (for DE-211)
NP21103: DB25 male terminal block kit for RS-422/485 transmission (for DE-211)
TB-M25: DB25 male DIN-Rail wiring terminal (for DE-211)
TB-M9 (for DE-311): DB9 male DIN-Rail wiring terminal (for DE-311)
DK-35A: Mounting Kit for 35-mm DIN-Rail

Package Checklist

- NPort® DE-211 or DE-311 serial device server
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

NPort® 5200 Series

2-port RS-232/422/485 serial device servers

- Small size for easy installation
- Versatile socket operation modes, including TCP Server, TCP Client, and UDP
- Easy-to-use Windows utility for configuring multiple device servers
- Supports 10/100M Ethernet
- Patented ADDC® (Automatic Data Direction Control) for 2-wire and 4-wire RS-485
- Built-in 15 KV ESD protection for all serial signals
- SNMP MIB-II for network management

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Standard TCP/IP Protocols and Choice of Operation Modes

NPort® 5200 device servers can operate in TCP Server, TCP Client, or UDP operation mode, ensuring compatibility with software based on a standard network API (Winsock, BSD Sockets).

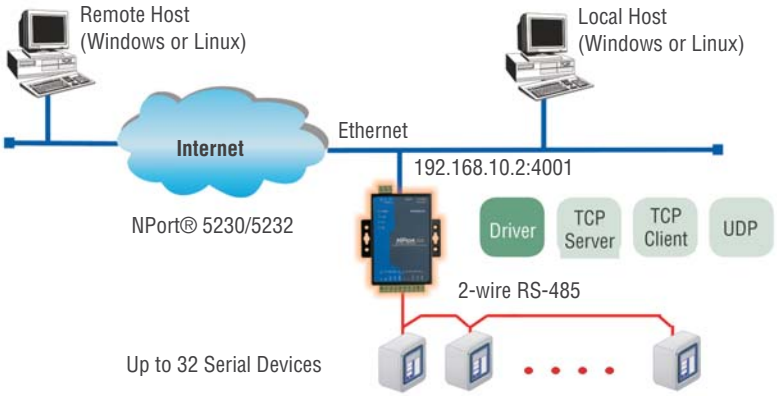
Real COM/TTY Drivers for Existing Software

With the Real COM/TTY drivers that are provided with each NPort®, software designed for communication with COM/TTY ports can be instantly and seamlessly integrated into a TCP/IP network. This is an excellent "no fuss" way to preserve your software investment and enjoy the benefits of networking your serial devices.

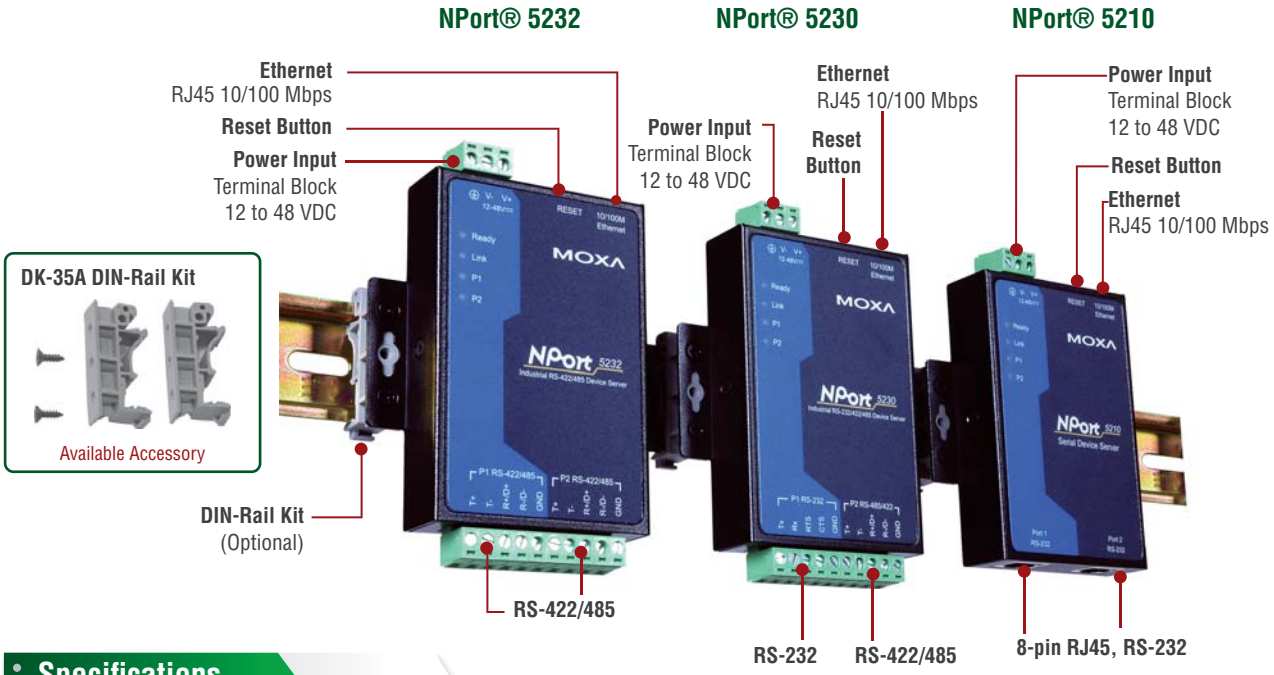
Control Remote Serial Devices with TCP/IP or Traditional COM/TTY Port

By specifying the NPort® 5200's IP address and port number, a network sockets API can obtain access to the attached serial device over the network, from any host computer that supports TCP/IP. For legacy Windows or Linux software that is COM or TTY-based, Moxa's COM/TTY drivers provide a seamless way of operating over the network.

COM Driver or Network Socket Operation



Appearance



Specifications

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 2

Serial Standards:
NPort® 5210: RS-232
NPort® 5230: 1 RS-232 port, 1 RS-422/485 port
NPort® 5232/5232I: RS-422/485

Connector:
NPort® 5210: RJ45 (8 pins)
NPort® 5230/5232/5232I: Terminal Block (5 contacts per port)

Serial Line Protection:
15 KV ESD protection for all signals
2 KV isolation protection (NPort® 5232I/5232I-T)

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS (RS-232 only), DTR/DSR (NPort® 5210 only), XON/XOFF

Baudrate: 110 bps to 230.4 Kbps

Serial Signals

RS-232:
NPort® 5210: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
NPort® 5230: TxD, RxD, RTS, CTS, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP

Configuration Options: Web Console, Serial Console (NPort® 5210/5230 only), Telnet Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Physical Characteristics

Housing: Metal, IP30 protection

Weight:
NPort® 5210: 340 g
NPort® 5230/5232: 360 g
NPort® 5232I: 380 g

Dimensions:
NPort® 5210/5230/5232:
Without ears: 67 x 100.4 x 22 mm (2.64 x 3.95 x 0.87 in)
With ears: 90 x 100.4 x 22 mm (3.54 x 3.95 x 0.87 in)
NPort® 5232I:
Without ears: 67 x 100.4 x 35 mm (2.64 x 3.95 x 1.37 in)
With ears: 90 x 100.4 x 35 mm (3.54 x 3.95 x 1.37 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
NPort® 5210: 325 mA @ 12 V, 190 mA @ 24 V
NPort® 5230: 325 mA @ 12 V, 190 mA @ 24 V
NPort® 5232: 280 mA @ 12 V, 150 mA @ 24 V
NPort® 5232I: 509.4 mA @ 12 V, 200 mA @ 24 V

Regulatory Approvals

EMC: CE (EN55022 and EN55024 Class A), FCC Part 15 Subpart B Class A

Safety: UL (UL60950-1), TÜV (EN60950-1)

Marine: DNV

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (meantime between failures):
NPort® 5210: 134850 hrs
NPort® 5230: 106955 hrs
NPort® 5232: 102344 hrs
NPort® 5232I: 87083 hrs

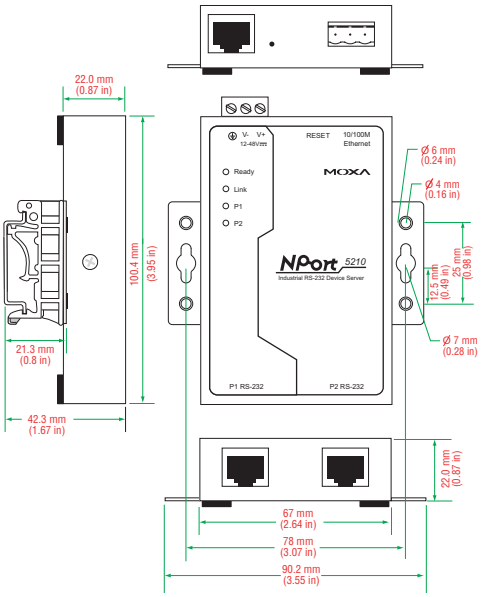
Warranty

Warranty Period: 5 years

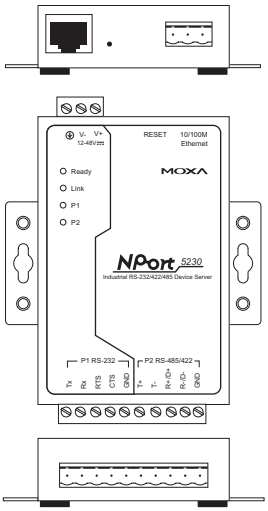
Details: See www.moxa.com/warranty

Dimensions

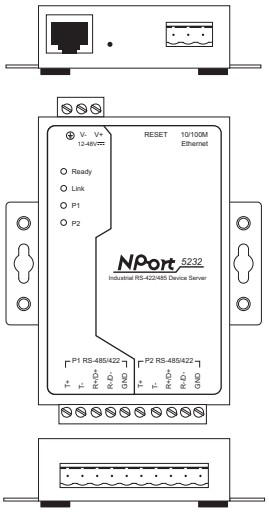
NPort® 5210



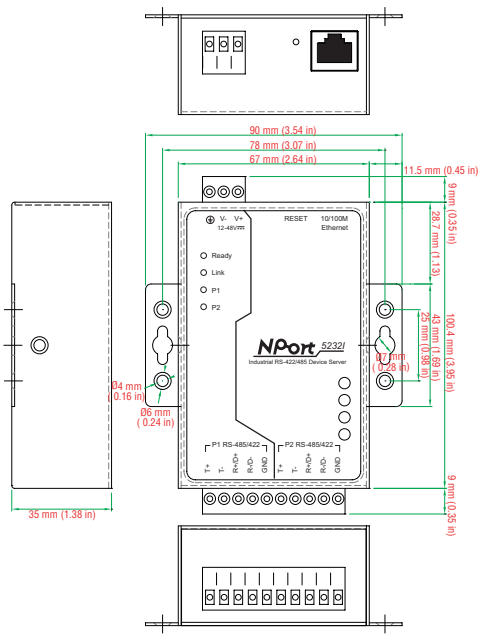
NPort® 5230



NPort® 5232

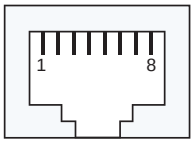


NPort® 5232I



Pin Assignment

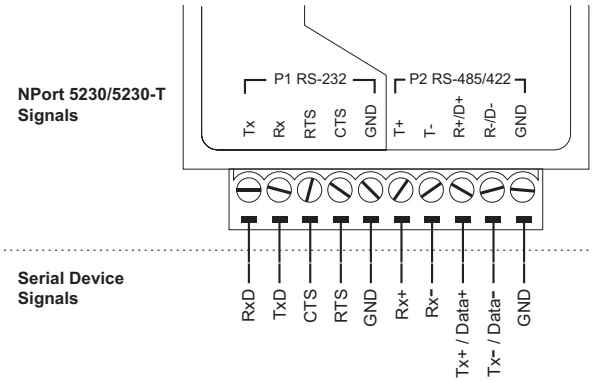
8-pin RJ45 connector



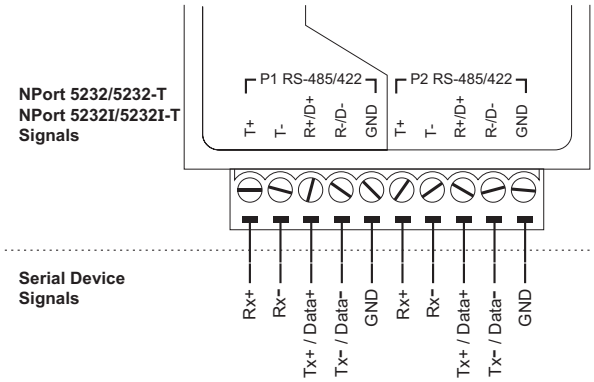
NPort® 5210/5210-T (RS-232)

PIN	RS-232
1	DSR (in)
2	RTS (out)
3	GND
4	TxD (out)
5	RxD (in)
6	DCD (in)
7	CTS (in)
8	DTR (out)

NPort® 5230/5230-T
(RS-232/422/485, terminal block connector)



NPort® 5232/5232I/5232-T/5232I-T
(RS-422/485, terminal block connector)



Ordering Information

Available Models

NPort® 5210: 2-port RS-232 device server, 0 to 55°C operating temperature

NPort® 5230: 2-port device server with 1 RS-232 port and 1 RS-422/485 port, 0 to 55°C operating temperature

NPort® 5232: 2-port RS-422/485 device server, 0 to 55°C operating temperature

NPort® 5232I: 2-port RS-422/485 device server with 2 KV optical isolation, 0 to 55°C operating temperature

NPort® 5210-T: 2-port RS-232 device server, -40 to 75°C operating temperature

NPort® 5230-T: 2-port device server with 1 RS-232 port and 1 RS-422/485 port, -40 to 75°C operating temperature

NPort® 5232-T: 2-port RS-422/485 device server, -40 to 75°C operating temperature

NPort® 5232I-T: 2-port RS-422/485 device server with 2 KV optical isolation, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail

DIN-Rail Power Supply: See page A-8 for details

Terminal Block: See page A-7 for details

Package Checklist

- NPort® 5200 series device server
- Power jack to 3-pin terminal block adaptor
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

NPort® 5400 Series

4-port RS-232/422/485 serial device servers

- Easy IP address configuration with built-in LCD panel
- 10/100M auto-sensing Ethernet
- 4 serial ports, with support for RS-232, RS-422, and RS-485
- Built-in 15 KV ESD surge protection for all serial signals
- Versatile socket operation modes, including TCP Server, TCP Client, and UDP
- Choice of configuration methods: Web console, Telnet console, and Windows utility
- SNMP MIB-II for network management
- 2 KV isolation protection for NPort® 5430I/5450I

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Network Readiness for up to Four Serial Devices

NPort® 5400 device servers can conveniently and transparently connect up to four serial devices to an Ethernet network, allowing you to network your existing serial devices with only basic configuration. Data transmission between the serial and Ethernet interfaces is bi-directional. By using NPort® device servers, you not only protect your current hardware investment, but also allow for future network expansion. You can both centralize the management of your serial devices, and distribute management hosts over the network.

Independent Operation Mode for each Serial Port

NPort® 5400 device servers can be used to connect different devices for remote data polling or event handling over a TCP/IP network. Each serial port on the NPort® 5400 operates independently to provide maximum versatility. For example, port 1 can operate in Driver mode, port 2 in TCP Server mode, and ports 3 and 4 in TCP Client mode.

User-friendly LCD Panel for Easy Installation

An LCD panel is built into the NPort® 5400's top panel, with four buttons for inputting data, configuration, and selecting the operation mode. The LCD panel displays the server name, serial number, and IP address, and can be used to enter or modify parameters such as IP address, netmask, and gateway.

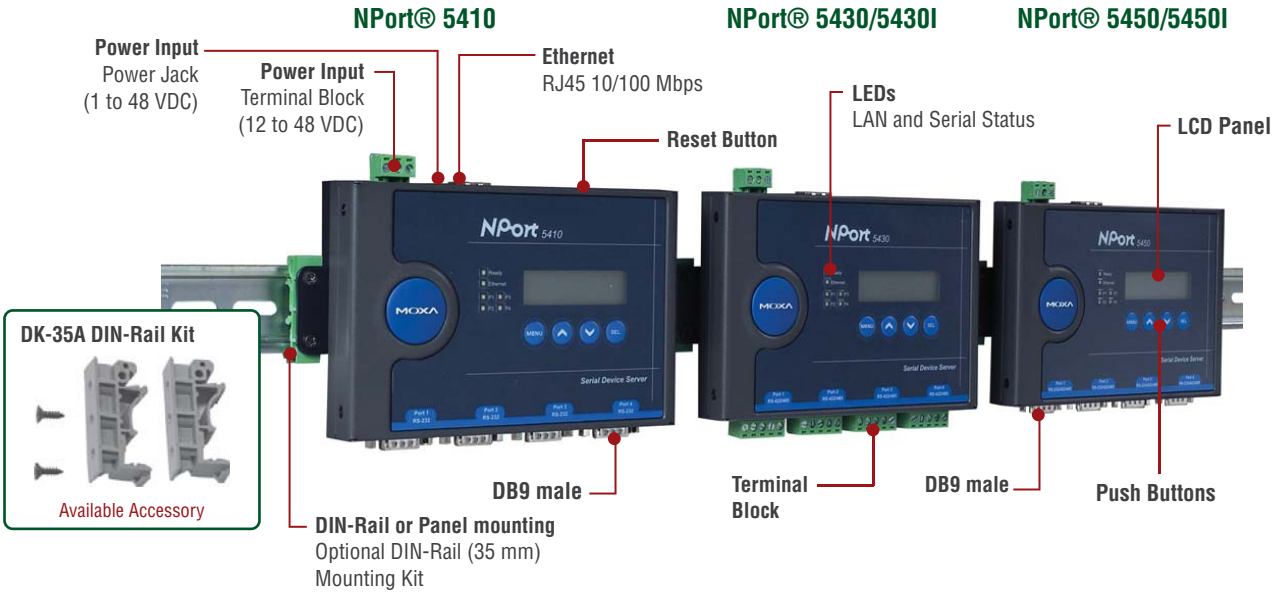
Redundant DC Power Inputs

NPort® 5400 device servers support redundant power sources and provide both a DC terminal block input and a DC power jack input. The two power inputs not only provide power redundancy, but also allow greater flexibility for use with different applications.

Adjustable Termination and pull High/Low Resistors

Termination resistors may be needed in some critical environments to prevent the reflection of serial signals. When using termination resistors, it is important to set the pull high/low resistors correctly to prevent the electrical signal from being corrupted. Since no set of resistor values is universally compatible with all environments, the NPort® 5400 has four sets of DIP switches on the bottom panel to set the termination and pull high/low resistor values.

Appearance



Specifications

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 4

Serial Standards:
NPort® 5410: RS-232
NPort® 5430/5430I: RS-422/485
NPort® 5450/5450I: RS-232/422/485

Connector:
NPort® 5410/5450/5450I: DB9 male
NPort® 5430/5430I: Terminal block

Serial Line Protection:
15 KV ESD protection for all signals
2 KV isolation protection (NPort® 5430I/5450I)

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Terminator for RS-485: 120 Ω

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF

Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, Rtelnet, ARP

Configuration Options: Web Console, Telnet Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Mini Screen with Push Buttons

LCD Panel: Liquid Crystal Display on the case

Push Buttons: Four push buttons for convenient on-site configuration

Physical Characteristics

Housing: Metal, IP30 protection

Weight: 740 g

Dimensions:
Without mounting kit: 158 x 103 x 33 mm (6.22 x 4.06 x 1.30 in)
With mounting kit: 176 x 103 x 33 mm (6.93 x 4.06 x 1.30 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 70°C (-4 to 158°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
NPort® 5410: 350 mA @ 12 V, 190 mA @ 24 V
NPort® 5430: 320 mA @ 12 V, 175 mA @ 24 V
NPort® 5430I: 530 mA @ 12 V, 280 mA @ 24 V
NPort® 5450: 350 mA @ 12 V, 190 mA @ 24 V
NPort® 5450I: 554 mA @ 12 V, 294 mA @ 24 V

Regulatory Approvals

EMC: CE (EN55022 and EN55024 Class A), FCC Part 15 Subpart B Class A

Safety: UL (UL60950-1), TÜV (EN60950-1)

Marine: DNV

Medical: EN60601-1-2 Class B, EN55011

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

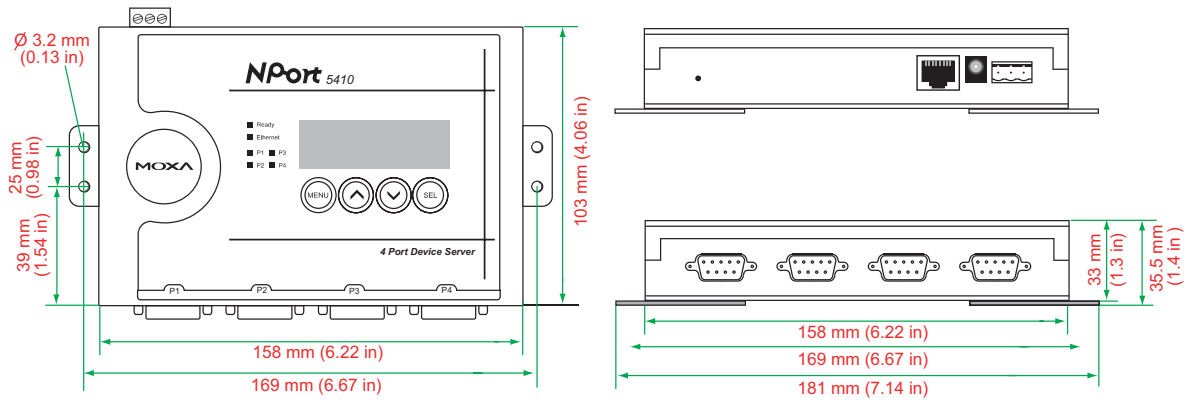
MTBF (meantime between failures):
NPort® 5410: 205153 hrs
NPort® 5430: 201699 hrs
NPort® 5430I: 114540 hrs
NPort® 5450: 206903 hrs
NPort® 5450I: 206903 hrs

Warranty

Warranty Period: 5 years

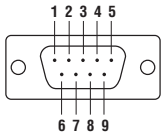
Details: See www.moxa.com/warranty

Dimensions



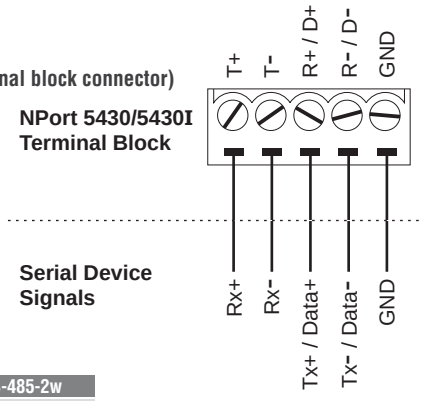
Pin Assignment

NPort® 5410
(RS-232, DB9 male connector)

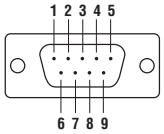


PIN	RS-232
1	DCD
2	RxD
3	RxD
4	DTR
5	GND
6	DSR
7	TRS
8	CTS
9	---

NPort® 5430/5430I
(RS-422/485, terminal block connector)



NPort® 5450/5450I (RS-232/422/485, DB9 male connector)
(RS-232/422/485, DB9 male connector)



PIN	RS-232	RS-422/RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	---
2	RxD	TxD+(B)	---
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	---	---
7	RTS	---	---
8	CTS	---	---

Ordering Information

Available Models

NPort® 5410: 4-port RS-232 device server

NPort® 5430: 4-port RS-422/485 device server

NPort® 5430I: 4-port RS-422/485 device server with 2 KV optical isolation

NPort® 5450: 4-port RS-232/422/485 device server

NPort® 5450I: 4-port RS-232/422/485 device server with 2 KV optical isolation

Package Checklist

- NPort® 5400 series device server
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail

DIN-Rail Power Supply: See page A-8 for details

Terminla Block: See page A-7 for details

Power Adaptor: See page A-9 for details

NPort® 5600 Rackmount Series

8 and 16-port RS-232/422/485 serial device servers

- 8 or 16 serial ports supporting RS-232/422/485
- Standard 19-inch rackmount size
- 10/100M auto-sensing Ethernet
- Built-in 15 KV ESD protection for all serial signals
- Easy IP address configuration with LCD panel
- Choice of configuration methods: Web console, Telnet console, and Windows utility
- Versatile socket operation modes, including TCP Server, TCP Client, UDP, and Real COM
- SNMP MIB-II for network management

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

With the NPort® 5600 rackmount series, you not only protect your current hardware investment, but also allow for future network expansion by centralizing the management of your serial devices and distributing management hosts over the network.

Network Readiness for up to 16 Serial Devices

Only basic configuration is needed with the NPort® 5600 to connect up to 16 serial devices to an Ethernet network.

19-inch Rackmount Device Server

NPort® 5600 device servers come with Tx/Rx LEDs for the serial ports on the front panel, and 8 or 16 RJ45 serial port connectors on the rear panel. This makes the NPort® 5600 device servers suitable for standard 19-inch rack mounting, allowing you to simplify operation, maintenance, and administrative tasks.

Real COM/TTY Ports

Real COM/TTY drivers are provided to make the serial ports on the NPort® 5600 recognizable as Real COM ports by Windows, or Real TTY ports by Linux. In addition to supporting basic data transmission and reception, the NPort® drivers also support the RTS, CTS, DTR, DSR, and DCD control signals.

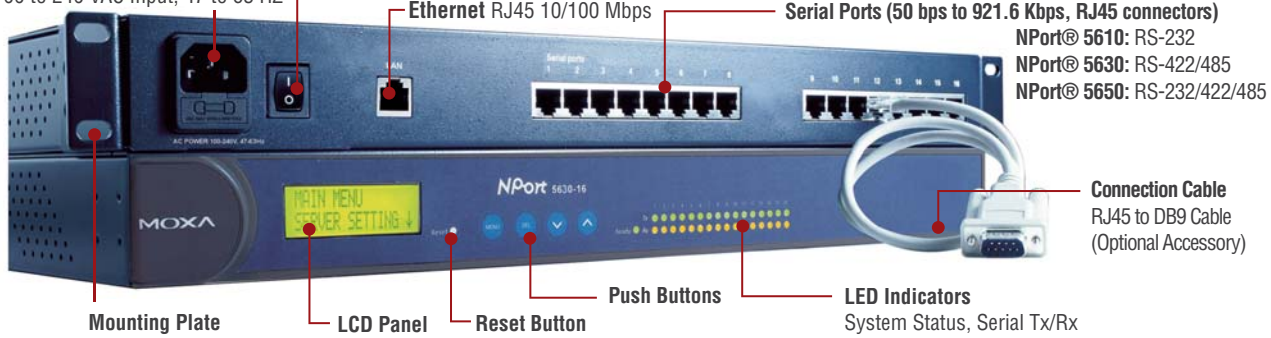
LED Indicators to Ease Your Maintenance Tasks

The System LED, serial Tx/Rx LEDs, and Ethernet LEDs (located on the RJ45 connector) provide a great tool for basic maintenance tasks, and help engineers analyze problems in the field. The LEDs not only indicate current system and network status, but also help field engineers monitor the status of attached serial devices.

Adjustable Termination and Pull High/Low Resistors

When using termination resistors to prevent serial signal reflection, it is important to set the pull high/low resistors correctly so that the electrical signal is not corrupted. Since no set of resistor values is universally compatible for all environments, the NPort® 5600 has DIP switches on the bottom panel for setting the termination and pull high/low resistor values.

Appearance



Specifications

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 KV built-in

Optical Fiber Interface

Distance:
Multi mode: 0 to 2 km, 1310 nm (62.5/125 µm, 500 MHz*km)
Single mode: 0 to 40 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))

Min. TX Output: -20 dBm (Multi mode), -5 dBm (Single mode)

Max. TX Output: -14 dBm (Multi mode), 0 dBm (Single mode)

Sensitivity: -34 to -30 dBm (Multi mode), -36 to -32 dBm (Single mode)

Serial Interface

Number of Ports: 8 or 16

Serial Standards:
NPort® 5610: RS-232
NPort® 5630: RS-422/485
NPort® 5650: RS-232/422/485

Connector: RJ45 (8 pins)

Serial Line Protection:
15 KV ESD protection for all signals

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: DSR/DTR and RTS/CTS (RS-232 only), XON/XOFF

Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, ARP, PPP, SLIP, RTelnet, RFC2217

Configuration Options: Web Console, Telnet Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Mini Screen with Push Buttons

LCD Panel: Liquid Crystal Display on the case

Push Buttons: Four push buttons for convenient on-site configuration

Physical Characteristics

Housing: Metal, IP30 protection

Weight:
NPort® 5610-8: 3340 g
NPort® 5610-8-48V: 3160 g
NPort® 5630-8, 5650-8-S-SC, 5650-8-M-SC: 3380 g
NPort® 5650-8: 3360 g
NPort® 5610-16: 3420 g
NPort® 5610-16-48V: 3260 g
NPort® 5630-16: 3400 g
NPort® 5650-16: 3460 g
NPort® 5650-16-S-SC, 5650-16-M-SC: 3440 g

Dimensions:
Without ears: 440 x 45 x 198 mm (17.32 x 1.77 x 7.80 in)
With ears: 480 x 45 x 198 mm (18.90 x 1.77 x 7.80 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 75°C (-4 to 167°F)

Power Requirements

Input Voltage:
NPort® 5610/5630/5650: 100 to 240 VAC, 47 to 63 hz
NPort® 5610-48V: ±48 VDC (20 to 72 VDC, -20 to -72 VDC)

Power Consumption:
NPort® 5610-8/16: 141 mA @ 100 VAC, 93 mA @ 240 VAC
NPort® 5630-8/16: 152 mA @ 100 VAC, 98 mA @ 240 VAC
NPort® 5610-8/16-48V: 135 mA @ 48 VDC
NPort® 5650-8/16: 158 mA @ 100 VAC, 102 mA @ 240 VAC
NPort® 5650-8/16-S-SC: 164 mA @ 100 VAC, 110 mA @ 240 VAC
NPort® 5650-8/16-M-SC: 174 mA @ 100 VAC, 113 mA @ 240 VAC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A
NPort® 5610 only: IEC61000-4-12

Safety: UL (UL60950-1), TÜV (EN60950-1)

Medical: EN60601-1-2 Class B, EN55011

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

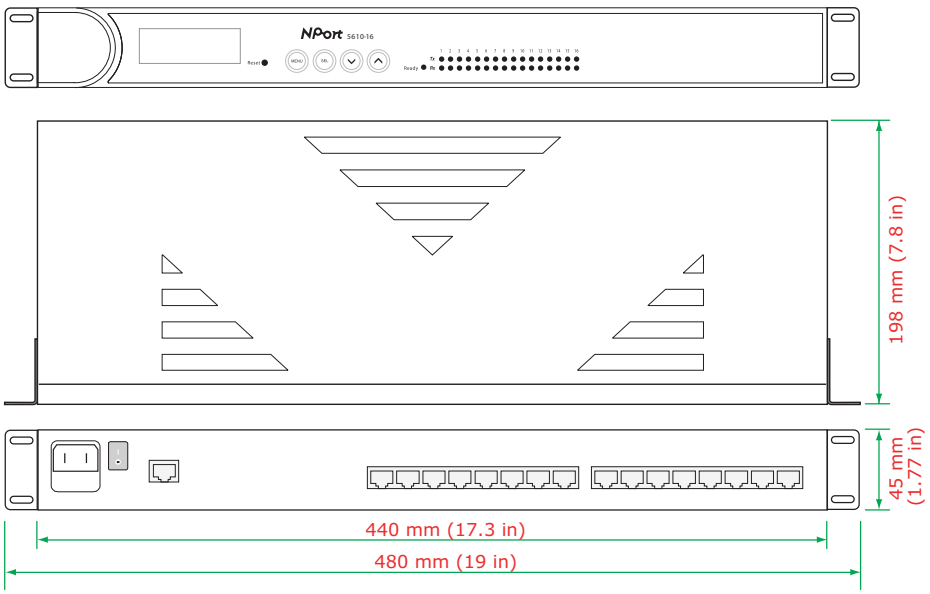
MTBF (meantime between failures):
NPort® 5610-8: 97294 hrs
NPort® 5610-16: 94928 hrs
NPort® 5610-8-48V: 96758
NPort® 5610-16-48V: 94417 hrs
NPort® 5630-8: 118405 hrs
NPort® 5630-16: 91483 hrs
NPort® 5650-8: 117584 hrs
NPort® 5650-16: 104767 hrs
NPort® 5650-S-SC-8: 116914 hrs
NPort® 5650-S-SC-16: 87528 hrs
NPort® 5650-M-SC-8: 116914 hrs
NPort® 5650-M-SC-16: 87528 hrs

Warranty

Warranty Period: 5 years

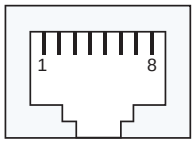
Details: See www.moxa.com/warranty

Dimensions



Pin Assignment

(8-pin RJ45 connector)



NPort® 5610: RS-232

PIN	RS-232
1	DSR
2	RTS
3	GND
4	TXD
5	RxD
6	DCD
7	CTS
8	DTR

NPort® 5630: RS-422/485

PIN	RS-422/485-4w	RS-485-2w
1	---	---
2	---	---
3	TxD+	---
4	TxD-	---
5	RxD-	Data+
6	RxD+	Data-
7	GND	GND
8	---	---

NPort® 5650: RS-232/422/485

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DSR	---	---
2	RTS	TxD+	---
3	GND	GND	GND
4	TXD	TxD-	---
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	---	---
8	DTR	---	---

Ordering Information

Available Models

NPort® 5610-8: 8-port RS-232 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5610-8-48V: 8-port RS-232 rackmount device server with RJ45 connectors and 48 VDC power input
NPort® 5630-8: 8-port RS-422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5650-8: 8-port RS-232/422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5650-8-M-SC: 8-port RS-232/422/485 rackmount device server with RJ45 connectors and 100BaseF(X) multi-mode fiber (SC connector)
NPort® 5650-8-S-SC: 8-port RS-232/422/485 rackmount device server with RJ45 connectors and 100BaseF(X) single-mode fiber (SC connector)
NPort® 5610-16: 16-port RS-232 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5610-16-48V: 16-port RS-232 rackmount device server with RJ45 connectors and 48 VDC power input
NPort® 5630-16: 16-port RS-422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5650-16: 16-port RS-232/422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5650-16-M-SC: 16-port RS-232/422/485 rackmount device server with RJ45 connectors and 100BaseF(X) multi-mode fiber (SC connector)
NPort® 5650-16-S-SC: 16-port RS-232/422/485 rackmount device server with RJ45 connectors and 100BaseF(X) single-mode fiber (SC connector)

Optional Accessories (can be purchased separately)

CBL-RJ45F25-150: 8-pin RJ45 to DB25 female cable, 150 cm
CBL-RJ45M25-150: 8-pin RJ45 to DB25 male cable, 150 cm
CBL-RJ45F9-150: 8- pin RJ45 to DB9 female cable, 150 cm
CBL-RJ45M9-150: 8-pin RJ45 to DB9 male cable, 150 cm

Package Checklist

- NPort® 5600 series device server
- Power Cord (see Appendix A)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

NPort® 5600 Desktop Series

8-port RS-232/422/485 serial device servers

- 8 serial ports supporting RS-232/422/485
- Compact desktop design
- 10/100M auto-detecting Ethernet
- Built-in 15 KV ESD protection for all serial signals
- Easy IP address configuration with LCD panel
- Choice of configuration methods: Web console, Telnet console, and Windows utility
- Versatile socket operation modes, including TCP Server, TCP Client, UDP, and Real COM
- SNMP MIB-II for network management
- Built-in speaker: Use your own voice as the alert when exceptions occur

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

NPort® 5600-8-DT device servers can conveniently and transparently connect 8 serial devices to an Ethernet network, allowing you to network your existing serial devices with only basic configuration. You can both centralize management of your serial devices and distribute management hosts over the network. Since the NPort® 5600-8-DT device servers have a smaller form factor compared to our 19-inch models, they are a great choice for applications that need additional serial ports, but for which mounting rails are not available.

Convenient Design for RS-485 Applications

The NPort® 5650-8-DT device servers support selectable 1 KΩ and 150 KΩ pull high/low resistors and a 120 Ω terminator. In some critical environments, termination resistors may be needed to prevent the reflection of serial signals. When using termination resistors, it is also important to set the pull high/low resistors correctly so that the electrical signal is not corrupted. Since no set of resistor values is universally compatible with all environments, NPort® 5600-8-DT device servers use DIP switches to allow users to adjust termination and pull high/low resistor values manually for each serial port.

Convenient Power Inputs

The NPort® 5650-8-DT device servers support both power terminal blocks and power jacks for ease of use and greater flexibility. Users can connect the terminal block directly to a DC power source, or use the power jack to connect to an AC circuit through an adaptor.

LED Indicators to Ease Your Maintenance Tasks

The System LED, Serial Tx/Rx LEDs, and Ethernet LEDs (located on the RJ45 connector) provide a great tool for basic maintenance tasks and help engineers analyze problems in the field. The NPort® 5600's LEDs not only indicate current system and network status, but also help field engineers monitor the status of attached serial devices.

Two Ethernet Ports for Convenient Cascade Wiring

The NPort® 5600-8-DT device servers come with two Ethernet ports that can be used as Ethernet switch ports. Connect one port to the network or server, and the other port to another Ethernet device. The dual Ethernet ports eliminate the need to connect each device to a separate Ethernet switch, reducing wiring costs.

Automatic Warning Function by Speaker and/or E-mail

The built-in speakers can be used to alert administrators of problems with the Ethernet links or power input. The web console indicates which Ethernet link or power input has failed. An e-mail warning can also be issued when an exception is detected. These functions are valuable tools that enable maintenance engineers to react promptly to emergency situations.

Appearance

Specifications

Ethernet Interface

Number of Ports: 2

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 8

Serial Standards:
NPort® 5610-8-DT: RS-232
NPort® 5650-8-DT: RS-232/422/485

Connector:
NPort® 5610-8-DT/5650-8-DT/5650I-8-DT: DB9 male
NPort® 5610-8-DT-J/5650-8-DT-J: RJ45 (8 pins)

Serial Line Protection:
15 KV ESD protection for all signals
2 KV isolation protection (NPort® 5650I-8-DT only)

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Terminator for RS-485: 120 Ω

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: DSR/DTR and RTS/CTS (RS-232 only), XON/XOFF

Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, Rtelnet, ARP, RFC2217

Configuration Options: Web Console, Telnet Console, Serial Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Mini Screen with Push Buttons

LCD Panel: Liquid Crystal Display on the case

Push Buttons: Four push buttons for convenient on-site configuration

Physical Characteristics

Housing: Metal, IP30 protection

Weight:
NPort® 5610-8-DT: 1760 g
NPort® 5610-8-DT-J: 1170 g
NPort® 5650-8-DT: 1770 g
NPort® 5650-8-DT-J: 1710 g
NPort® 5650I-8-DT: 1850 g

Dimensions:
Without ears: 197 x 44 x 135.5 mm (7.76 x 1.73 x 5.33 in)
With ears: 229 x 46 x 135.5 mm (9.01 x 1.81 x 5.33 in)
With DIN-Rail kit on bottom panel: 197 x 53 x 135.5 mm (7.76 x 2.09 x 5.33 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 70°C (-4 to 158°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
NPort® 5610-8-DT:
611 mA @ 12 V, 300 mA @ 24 V, 140 mA @ 48 V
NPort® 5610-8-DT-J:
611 mA @ 12 V, 300 mA @ 24 V, 140 mA @ 48 V
NPort® 5650-8-DT:
615 mA @ 12 V, 300 mA @ 24 V, 156 mA @ 48 V
NPort® 5650I-8-DT:
1066 mA @ 12 V, 510 mA @ 24 V, 200 mA @ 48 V
NPort® 5650-8-DT-J:
615 mA @ 12 V, 300 mA @ 24 V, 156 mA @ 48 V

Regulatory Approvals

EMC: CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A

Safety: UL (UL60950-1), TÜV (EN60950-1)

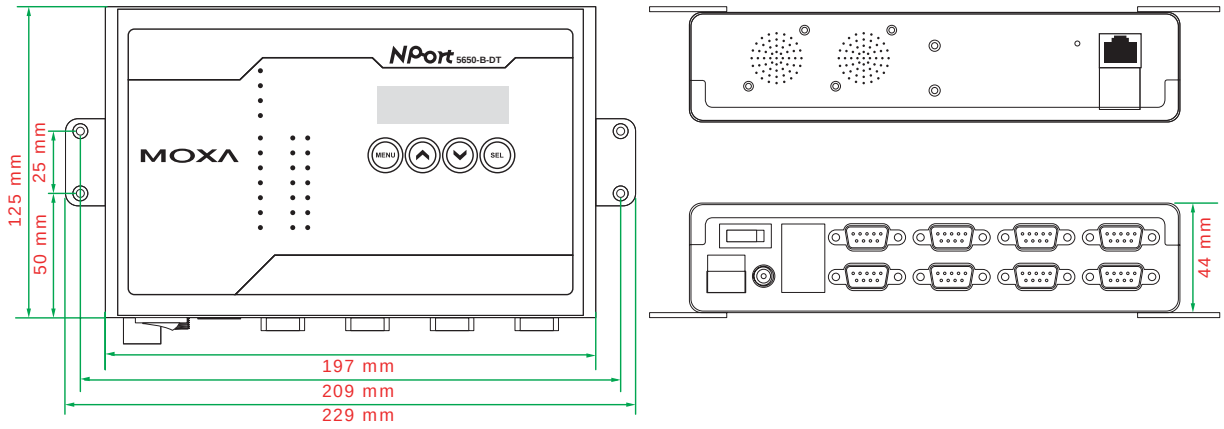
Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (meantime between failures): 163356 hrs

Warranty

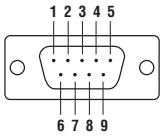
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions



Pin Assignment

DB9 male connector



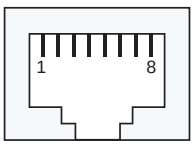
NPort® 5610-8-DT (RS-232)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

NPort® 5650-8-DT/5650I-8-DT (RS-232/422/485)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

8-pin RJ45 connector



NPort® 5610-8-DT-J (RS-232)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

NPort® 5650-8-DT-J (RS-232/422/485)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DSR	---	---
2	RTS	TxD+	---
3	GND	GND	GND
4	TXD	TxD-	---
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	---	---
8	DTR	---	---

Ordering Information

Available Models

NPort® 5610-8-DT: 8-port RS-232 desktop device server with DB9 male connectors and 48 VDC power input
NPort® 5610-8-DT-J: 8-port RS-232 desktop device server with RJ45 connectors and 48 VDC power input
NPort® 5650-8-DT: 8-port RS-232/422/485 desktop device server with DB9 male connectors and 48 VDC power input
NPort® 5650-8-DT-J: 8-port RS-232/422/485 desktop device server with RJ45 connectors and 48 VDC power input
NPort® 5650I-8-DT: 8-port RS-232/422/485 desktop device server with DB9 male connectors, 48 VDC power input, and 2 KV optical isolation

Optional Accessories (can be purchased separately)

CBL-RJ45F25-150: 8-pin RJ45 to DB25 female cable, 150 cm
CBL-RJ45M25-150: 8-pin RJ45 to DB25 male cable, 150 cm
CBL-RJ45F9-150: 8-pin RJ45 to DB9 female cable, 150 cm
CBL-RJ45M9-150: 8-pin RJ45 to DB9 male cable, 150 cm

Package Checklist

- NPort® 5600 series device server
- Power Adaptor (see Appendix A)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

NPort® IA5000 Series

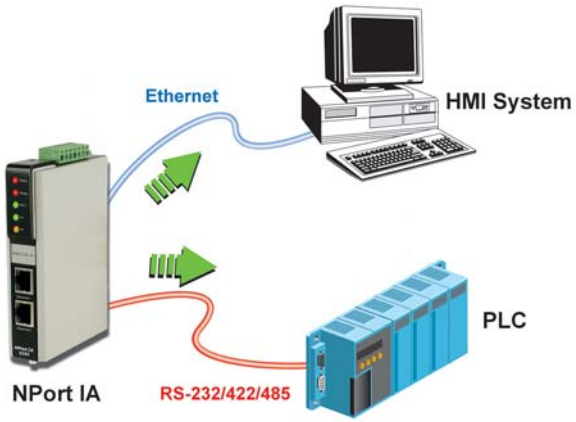
1 and 2-port serial device servers for industrial automation

- Versatile socket operation modes, including TCP Server, TCP Client, UDP
- Patented ADDC® (automatic data direction control) for 2-wire and 4-wire RS-485
- Cascading Ethernet ports for easy wiring (applies only to RJ45 connectors)
- Redundant DC power inputs
- Warning by relay output and e-mail
- 10/100BaseTX (RJ45) or 100BaseFX (single mode or multi-mode with SC connector)
- IP30-rated housing

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

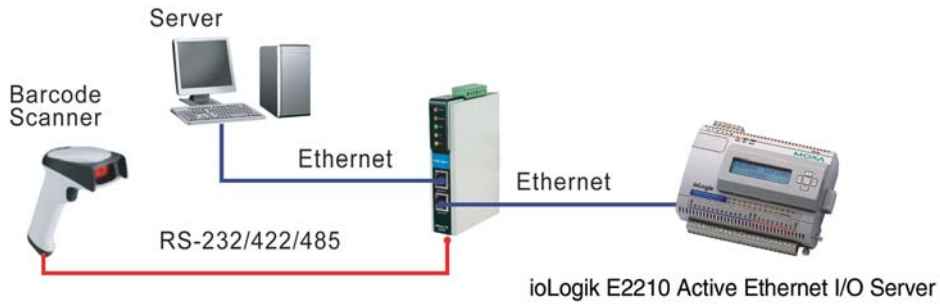
Overview

NPort® IA device servers provide easy and reliable serial-to-Ethernet connectivity for industrial automation applications. The device servers can connect any serial device to an Ethernet network, and to ensure compatibility with network software, they support a variety of port operation modes, including TCP Server, TCP Client, and UDP. The rock-solid reliability of the NPort® IA device servers makes them an ideal choice for establishing network access to RS-232/422/485 serial devices such as PLCs, sensors, meters, motors, drives, barcode readers, and operator displays. All models are housed in a compact, rugged housing that is DIN-rail mountable.



Cascading Ethernet Ports Make Wiring Easy (10/100BaseTX models only)

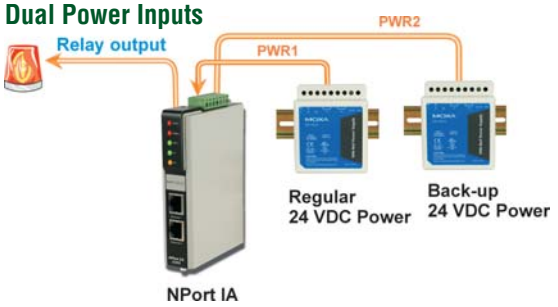
The NPort® IA5150 and IA5250 device servers each have two Ethernet ports that can be used as Ethernet switch ports. One port connects directly to the network or server, and the other port can be connected to another NPort® IA device server or another Ethernet device. The dual Ethernet ports help reduce wiring costs by eliminating the need to connect each device to a separate Ethernet switch.



Redundant Power Inputs

The NPort® IA5000 device servers have two power inputs that can be connected simultaneously to live DC power sources. If one power source fails, the other source takes over automatically. Redundant power inputs help assure non-stop operation of your device server.

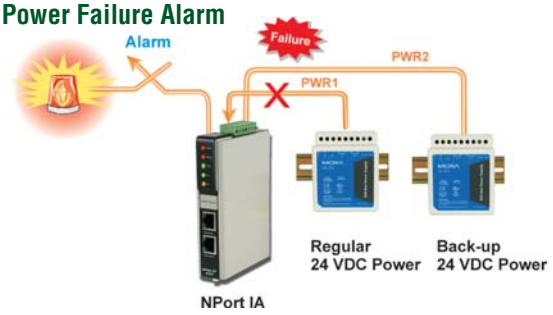
Dual Power Inputs



Relay Output Warning and E-mail Alerts

The built-in relay output can be used to alert administrators of problems with the Ethernet links or power inputs, or when there is a change in the DCD or DSR serial signals. The web console indicates which Ethernet link or power input has failed, or which serial signal has changed. An e-mail warning can also be issued when an exception is detected. These functions are valuable tools that enable maintenance engineers to react promptly to emergency situations.

Power Failure Alarm



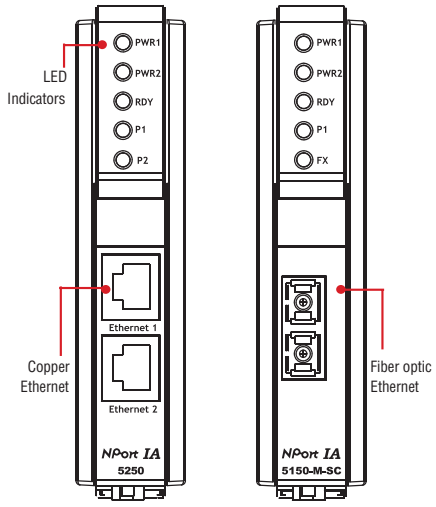
Optical Fiber for Ethernet Communication

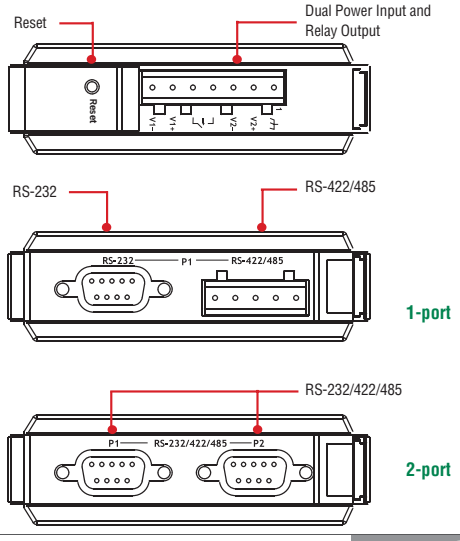
The NPort® IA5000 series includes 100BaseFX fiber models that support transmission distances up to 2 km for multi-mode models, and up to 40 km for single-mode models. Optical fiber is well-suited for industrial applications because it is immune to electromagnetic noise and interference. For environments that experience high ground loop voltages, fiber provides the best isolation protection, and because there is no danger of sparking, optical fiber is safer than copper wire to use in hazardous environments.

Industrial-grade Certification

To ensure safe and reliable operation in industrial environments, the NPort® IA5000 device servers have obtained various industrial certifications, including an IP30 rating for mechanical protection, UL508 safety certification for industrial control equipment, and explosion-safe certifications for hazardous locations. Certifications include UL/cUL Class 1 Division 2 Groups A, B, C, D, and ATEX Class 1 Zone 2.

Appearance





Specifications

Ethernet Interface (NPort® IA5150/5150I/5250)

Number of Ports: 2

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 KV built-in

Optical Fiber Interface (-M-SC and -S-SC models)

Fiber Port: 100 BaseFX, SC connector

Distance:
Multi mode: 0 to 2 km, 1310 nm (62.5/125 µm, 500 MHz*km)
Single mode: 0 to 40 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))

Min. TX Output: -20 dBm (Multi mode), -5 dBm (Single mode)

Max. TX Output: -14 dBm (Multi mode), 0 dBm (Single mode)

Sensitivity: -34 to -30 dBm (Multi mode), -36 to -32 dBm (Single mode)

Serial Interface

Number of Ports:
NPort® IA5150: 1
NPort® IA5250: 2

Serial Standards: RS-232/422/485

Connector:
NPort® IA5150: DB9 male for RS-232, terminal block for RS-422/485
NPort® IA5250: DB9 male for RS-232/422/485

Serial Line Protection:
15 KV ESD protection for all signals
2 KV isolation protection (NPort® IA5150I, NPort® 5150I-M-SC, NPort® 5150I-S-SC)

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF

Baudrate: 110 bps to 230.4 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, Rtelnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP

Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Physical Characteristics

Housing: Plastic, IP30 protection

Weight:
NPort® IA5150: 360 g
NPort® IA5250: 380 g

Dimensions: 29 x 89.2 x 118.5 mm (0.82 x 3.51 x 4.57 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
NPort® IA5150: 360 mA @ 12 V, 195 mA @ 24 V
NPort® IA5150I: 420 mA @ 12 V, 215 mA @ 24 V
NPort® IA5250: 440 mA @ 12 V, 200 mA @ 24 V
NPort® IA5150-S-SC: 470 mA @ 12 V, 210 mA @ 24 V
NPort® IA5150I-S-SC: 490 mA @ 12 V, 250 mA @ 24 V
NPort® IA5150-M-SC: 500 mA @ 12 V, 250 mA @ 24 V
NPort® IA5150I-M-SC: 510 mA @ 12 V, 260 mA @ 24 V

Regulatory Approvals

EMC: CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A

Safety: UL (UL60950-1), UL508, TÜV (EN60950-1)

Hazardous Location: UL/cUL Class 1 Division 2 Groups A, B, C and D

ATEX: Class I, Zone 2

Marine: DNV

EMS:
EN61000-4-2 (ESD), Level 3
EN61000-4-3 (RS), Level 3
EN61000-4-4 (EFT), Level 4
EN61000-4-5 (Surge), Level 3
EN61000-4-6 (CS), Level 3
EN61000-4-8
EN61000-4-11
EN61000-4-12

Shock: IEC60068-2-27

Freefall: IEC60068-2-32

Vibration: IEC60068-2-6

Dust-proof: IP30

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (meantime between failures):
NPort IA5150 Series: 183747 hrs
NPort IA5150I Series: 195614 hrs
NPort IA5250 Series: 194765 hrs

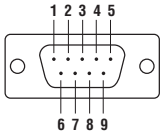
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

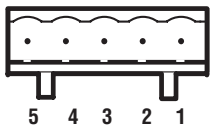
Pin Assignment

RS-232/422/485 DB9 male port



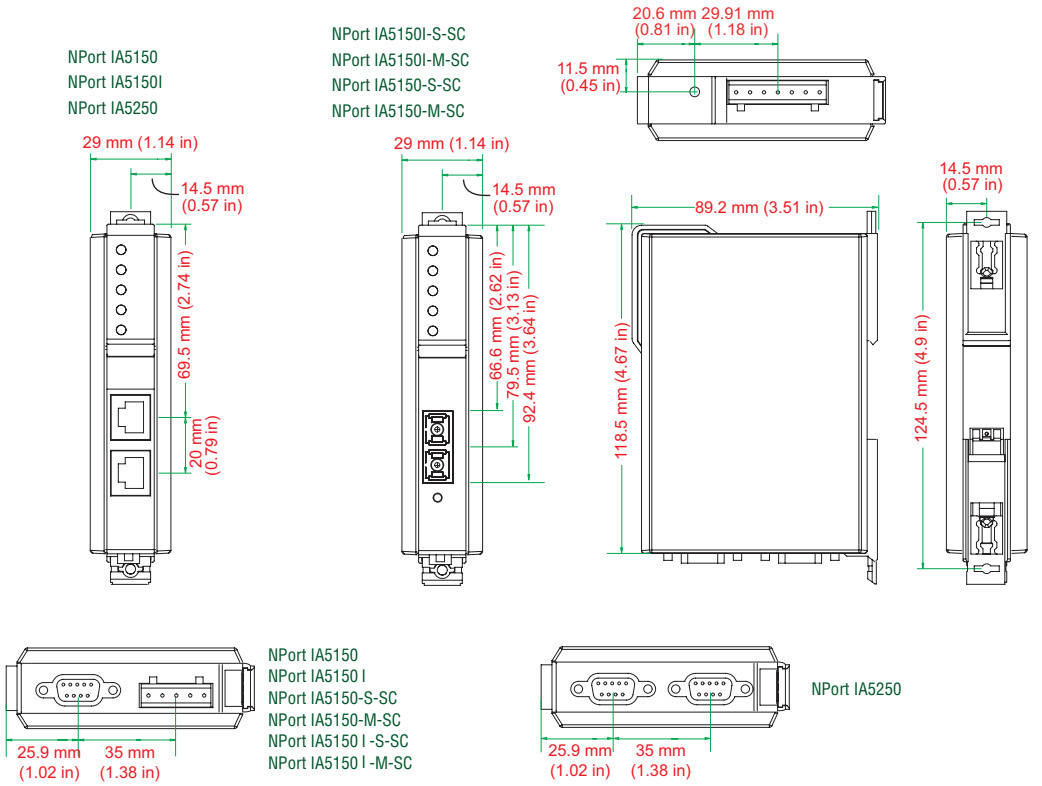
PIN	RS-232	RS-422/RS-485-4w	RS-485-2W
1	DCD	TxD-(A)	–
2	RXD	TxD+(B)	–
3	TXD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

RS-422/485 Terminal Block Wiring



PIN	RS-422/RS-485-4w	RS-485-2w
1	TxD+(B)	–
2	TxD-(A)	–
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND

Dimensions



Ordering Information

Available Models

NPort® IA5150: 1-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP), 0 to 55°C operating temperature

NPort® IA5150I: 1-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP) and 2 KV optical isolation, 0 to 55°C operating temperature

NPort® IA5150-M-SC: 1-port RS-232/422/485 device server with 1 100BaseF(X) multi-mode fiber port (SC connectors), 0 to 55°C operating temperature

NPort® IA5150I-M-SC: 1-port RS-232/422/485 device server with 1 100BaseF(X) multi-mode fiber port (SC connectors) and 2 KV optical isolation, 0 to 55°C operating temperature

NPort® IA5150-S-SC: 1-port RS-232/422/485 device server with 1 100BaseF(X) single-mode fiber port (SC connectors), 0 to 55°C operating temperature

NPort® IA5150I-S-SC: 1-port RS-232/422/485 device server with 1 100BaseF(X) single-mode fiber port (SC connectors) and 2 KV optical isolation, 0 to 55°C operating temperature

NPort® IA5250: 2-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP), 0 to 55°C operating temperature

NPort® IA5150-T: 1-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP), -40 to 75°C operating temperature

NPort® IA5150I-T: 1-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP) and 2 KV optical isolation, -40 to 75°C operating temperature

NPort® IA5150-M-SC-T: 1-port RS-232/422/485 device server with 1 100BaseF(X) multi-mode fiber port (SC connectors), -40 to 75°C operating temperature

NPort® IA5150I-M-SC-T: 1-port RS-232/422/485 device server with 1 100BaseF(X) multi-mode fiber port (SC connectors) and 2 KV optical isolation, -40 to 75°C operating temperature

NPort® IA5150-S-SC-T: 1-port RS-232/422/485 device server with 1 100BaseF(X) single-mode fiber port (SC connectors), -40 to 75°C operating temperature

NPort® IA5150I-S-SC-T: 1-port RS-232/422/485 device server with 1 100BaseF(X) single-mode fiber port (SC connectors) and 2 KV optical isolation, -40 to 75°C operating temperature

NPort® IA5250-T: 2-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP), -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

Optical Fiber Patch Cord: See page A-14

Terminal Block for RS-422/485 ports: See page A-7

Power Jack to Terminal Block Cable: See page A-7

Package Checklist

- NPort IA series device server
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Coming Soon

MiiNePort E1 Series

10/100 Mbps embedded serial device servers

- Same size as an RJ45 connector—only 33.9 x 16.25 x 13.5 mm
- Extremely low power consumption—only 160 mA @ 3.3 VDC input
- Uses the MiiNe, Moxa's second generation SoC
- NetEZ technology makes integration incredibly easy
- Versatile choice of operation modes: Real COM, RFC2217, TCP Server, TCP Client, UDP, and Modem

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

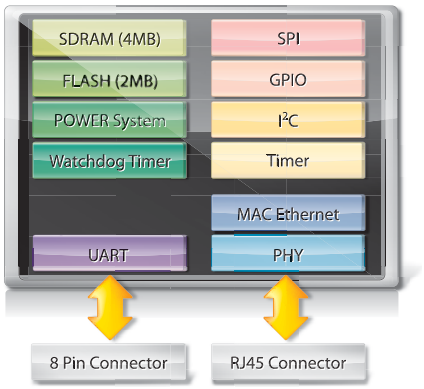
Overview

Moxa's MiiNePort E1 embedded device servers are designed for manufacturers who want to add sophisticated network connectivity to their serial devices with minimal integration effort. The MiiNePort E1 is empowered by the MiiNe, Moxa's second generation SoC, which supports 10/100 Mbps Ethernet, up to 921.6 Kbps serial baudrate, a versatile selection of ready-to-use operation modes, and requires only a small amount of power. By using Moxa's innovative NetEZ technology, the MiiNePort E1 can be used to convert any device with a standard serial interface to an Ethernet enabled device in no time. In addition, the MiiNePort E1 is the size of an RJ45 connector, making it easy to fit into virtually any existing serial device.

The MiiNe—Moxa's 2nd Generation SoC

The MiiNe was created to provide manufacturers with a competitive embedded serial-to-Ethernet solution. The MiiNePort E1, which uses the MiiNe for its SoC, is one of the world's tiniest embedded device servers, and has the lowest power consumption of any similar product. The MiiNe has the following features:

- Designed for 1 or 2-port serial-to-Ethernet applications
- Uses a 32-bit ARM 7 core
- Uses Moxa's own advanced UART technology
- Has 2 MB Flash and 4 MB SDRAM memory built in

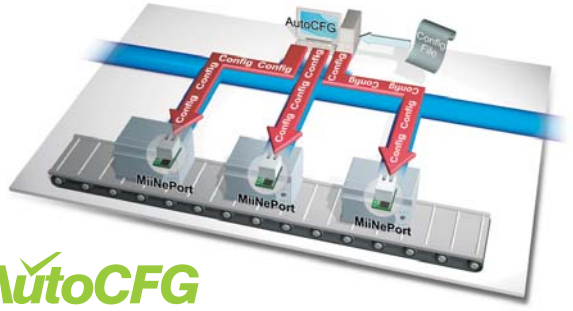


NetEZ Technology

Moxa's NetEZ technology gives serial device manufacturers a range of powerful tools for integrating Ethernet capability into serial devices:

- SCM: The MiiNePort E1's Serial Command Mode (SCM) enables the device's main system to reset the network and configure both serial and Ethernet settings. This is done using simple command frame format, and provides the convenience of being able to easily configure the network settings at anytime.
- AutoCFG: The MiiNePort E1 supports AutoCFG, which provides an effortless way of configuring network settings of many devices during mass production.

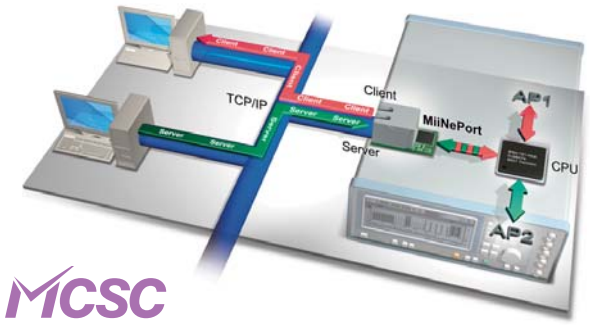
SCM



AutoCFG

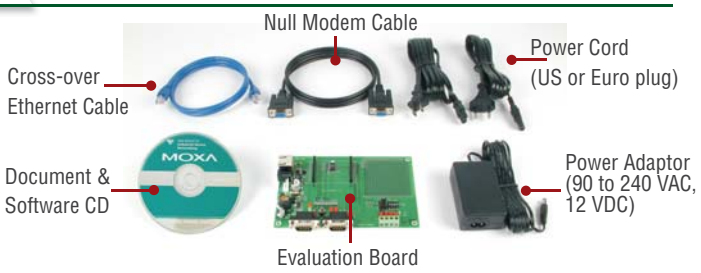
- MCSC: In some special circumstances, device end-users need the device to be in Server mode and Client mode at the same time, which requires that the embedded device server support multi-channel communication. The MiiNePort E1's Multi-Channel Serial Communication (MCSC) feature uses a clever software solution to provide the device with multi-channel functionality.

Moxa's NetEZ technology makes the MiiNePort E1 the world's most user-friendly embedded device server by promising ease-of-use with minimal integration work required.

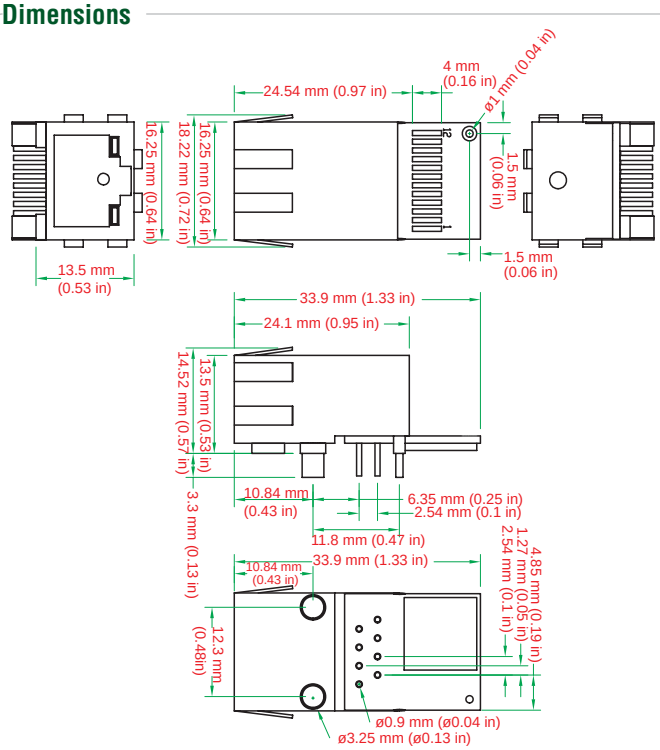


MiiNePort E1 Starter Kit

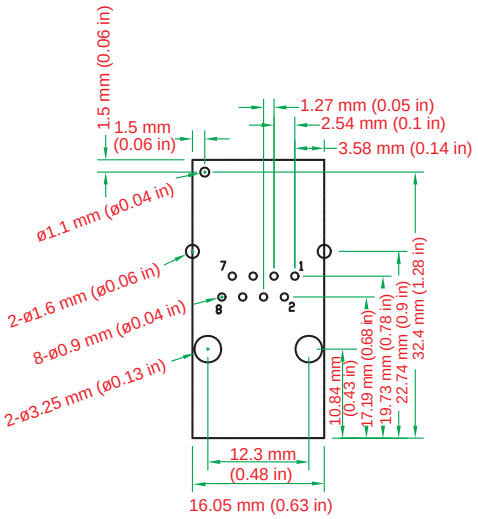
The MiiNePort E1 Starter Kit includes the MiiNePort E1 module, an evaluation board, power adaptor, software, and serial and Ethernet cables to allow quick and easy evaluation of all embedded device server functions. The evaluation board is equipped with serial, Ethernet, digital I/O, and power circuits to help you test your MiiNePort E1 modules and applications.



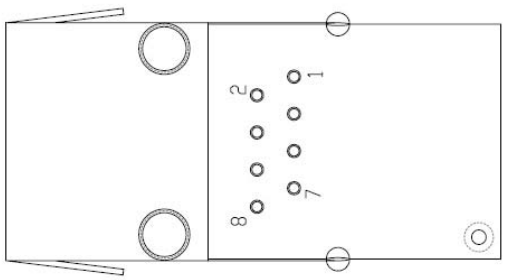
Dimensions



Recommended PC Board Layout



Pin Assignment



Pin	Function	Pin	Function
1	GND	5	Data In
2	VCC	6	Ready/RTS[a]
3	Reset	7	DIO[b]
4	Data Out	8	CTS[c]

a. Pin 6 can be configured as Ready/RTS (Request to Send), Ready/DO, or RS-485 Tx Enabled (default is Ready/RTS)
b. Pin 7 can be configured as DIO, Modem Control Out, RS-485 Tx Enable, or Reset to Default (default is DIO)
c. Pin 8 can be configured as CTS (Clear to Send), DI, or Modem Control In (default is CTS)

Specifications

Form Factor

Type: Drop-in module

Dimensions: 33.9 x 16.25 x 13.5 mm (13.35 x 6.4 x 5.31 in)

Weight: 9 g

System Information

CPU: 32-bit ARM 7 Core

RAM: 4 MB built in

Flash: 2 MB built in

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: RJ45 (with magnetics)

Magnetic Isolation Protection: 1.5 KV built-in

LEDs: 10BASE-T & 100BASE-TX Link Activity, Fault/In-Use

Serial Interface

Number of Ports: 1

Transmission Format: Standard TTL

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF

Baudrate: 50 bps to 230.4 Kbps* (supports non-standard baudrates)

* Baudrates up to 921.6 Kbps available by request

Serial Signals

TTL: TxD, RxD, RTS, CTS, RST (reset circuit), GND

Digital I/O Pins

GPIO: 3 programmable I/O pins (1 DO, 1 DI, 1 DI/O)

Software

Network Protocols: ICMP, ARP, IP, TCP, UDP, DHCP, HTTP, SNMP V1/V2c, SMTP, TFTP, Auto IP, Telnet, BOOTP

Configuration Options: Web Console, Serial Console (Serial Command Mode), Telnet Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Operation Modes: TCP Server, TCP Client, UDP, Real COM mode, Modem Mode, RFC2217

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 3.3 VDC (±5%)

Power Consumption: 160 mA @ 3.3 VDC max.

Regulatory Approvals

EMC:

- Radiated & conducted emissions: Complies with Class B limits of EN55022:1998
- Direct & Indirect ESD: Complies with EN55024:1998
- Electrical Fast Transient/Burst Immunity: Complies with EN55024:1998
- Power Frequency Magnetic Field Immunity: Complies with EN55024:1998

Shock: 500 g's for non-operational shock

Vibration: 20 g's for non-operational vibration

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Ordering Information

Available Modules

MiiNePort E1: Embedded device server module for TTL devices supporting 10/100BaseT(x) with RJ45 connector, 0 to 55°C operating temperature

MiiNePort E1-T: Embedded device server module for TTL devices supporting 10/100BaseT(x) with RJ45 connector, -40 to 75°C operating temperature

Available Starter Kits

MiiNePort E1-ST: Starter kit for the MiiNePort E1 Series

Package Checklist (modules)

- MiiNePort E1 Series module

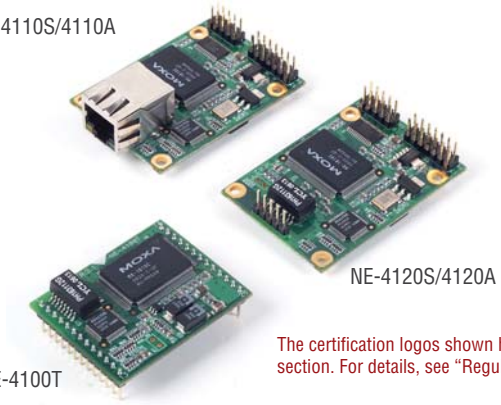
Package Checklist (starter kits)

- MiiNePort E1 module
- MiiNePort E1-ST evaluation board
- Universal power adaptor
- 2 power cords
- Null modem cable
- Cross-over Ethernet cable
- Document and Software CD
- Quick Installation Guide
- Warranty Card

NE-4100 Series

10/100 Mbps embedded serial device servers

NE-4110S/4110A



NE-4120S/4120A

NE-4100T

- 10/100 Mbps Ethernet interface
- Up to 230.4 Kbps baudrate support
- Choice of operation modes: Real COM, TCP Server, TCP Client, and UDP
- DHCP, BootP, Static IP, and ARP supported
- SNMP and e-mail alerts for event trapping and notification
- Half the size of a credit card—only 57 × 40 mm
- Low power consumption at 1.5W, with single +5V input

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

Moxa's NE-4100 embedded device servers are designed for manufacturers who want to add sophisticated network connectivity to their serial devices. Moxa's embedded device servers can be used to convert any device with a standard serial interface to an Ethernet-enabled device in no time. The NE-4100 embedded device servers support 10/100 Mbps Ethernet, and provide ready-to-use operation modes, including TCP Server, TCP Client, and UDP. In addition, a Real COM driver is included for backward compatibility with legacy software.

SNMP and E-mail Alerts for Event Trap and Notification

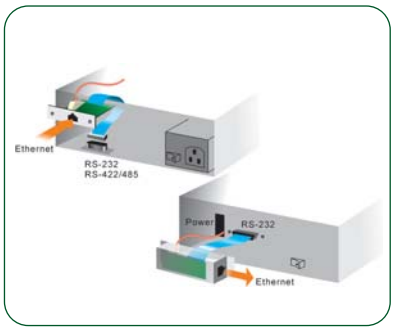
NE-4100 embedded device servers can be configured to send an SNMP trap or e-mail under the following conditions:

- Cold/warm start
- Password authentication failure
- Change in DSR/DCD line signal
- Change in IP address
- Change in password

On-site Configuration with Serial Command Mode

- Easy on-site configuration of network settings
- Simple command frame format
- Comprehensive command set for serial and network configuration
- Easily switch between software and hardware triggers
- Software reset

Typical Installation Examples



NE-4110: RJ45 Ethernet connector in stand-alone form factor

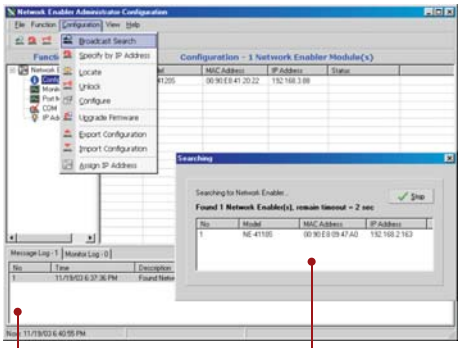
NE-4120: Pin-header Ethernet in stand-alone form factor

NE-4100T: Dual-in-line pin header in drop-in form factor

Powerful, User-friendly Utilities

Web-based Configuration

NE-4100 embedded device servers can be configured with the web console, which can be accessed from the web browser of any networked computer.



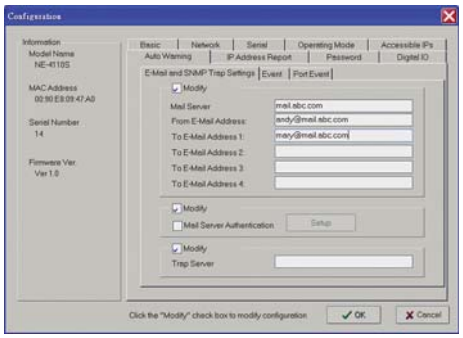
System log for cold boot, warm boot, etc.

Search for installed embedded device servers

Configure and manage embedded device servers with Moxa's Windows Utility

Network Enabler Administrator is a powerful, Windows-based configuration and management tool for NE-4100 embedded device servers. With Network Enabler Administrator, users can modify IP addresses, update communication parameters, and configure all other settings over the network. This utility has the following useful features:

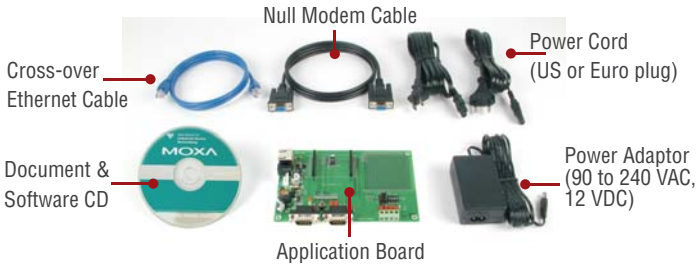
- Search your LAN for embedded device servers
- Export and import configuration parameters
- Upgrade firmware over the network
- Remotely monitor data traffic, serial line status, and TCP/IP connections
- Configure SNMP and e-mail alerts



Remotely configure serial, network, alarm, and other parameters

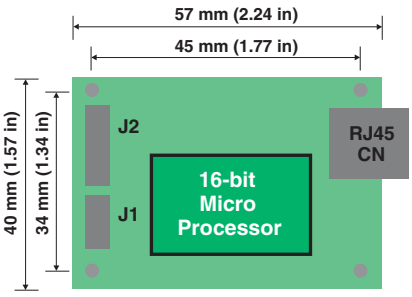
NE-4100 Starter Kit

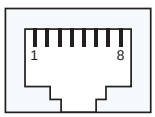
The Network Enabler Starter Kit includes an evaluation board, power adaptor, software, and serial and Ethernet cables to allow quick and easy evaluation of all embedded device server functions. The evaluation board is equipped with serial, Ethernet, digital I/O, and power circuits to help you test your modules and applications.



Dimensions and Pin Assignment

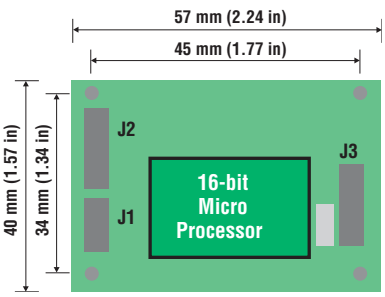
NE-4110S/4110A





PIN	Signals
1	Tx+
2	Tx-
3	Rx+
6	Rx-

NE-4120S/4120A



J3

Ethernet Pin-header

1	Tx+
2	Tx-
3	
4	Rx+
5	Rx-

NE-4110/4120 Series

J2

GND	14	13	VCC(+5V)
GND	12	11	VCC(+5V)
DIO0	10	9	10M_LED
DIO1	8	7	100M_LED
DIO2	6	5	Ready_LED
DIO3	4	3	Reset
TxD1	2	1	RxD1

NE-4110S/4120S

J1

NC	10	9	NC
CTS0	8	7	RTS0
DSR0	6	5	GND
DTR0	4	3	TxD0
RxD0	2	1	DCD0

NE-4110A/4120A

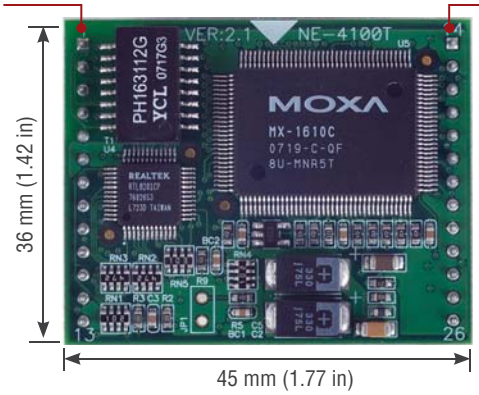
J1

NC	10	9	NC
NC	8	7	NC
NC	6	5	GND
RxD- (Data-)	4	3	RxD+ (Data+)
TxD+	2	1	TxD-

For 2-wire RS-485 mode, Pin 3 is Data+, Pin 4 is Data-

NE-4110T

Pin No.	Signal
1	ETx+
2	ETx-
3	ERx+
4	ERx-
5	LED 10M
6	TxD0
7	RxD0
8	RTS0
9	CTS0
10	Reset
11	GND
12	GND
13	TxD1



Pin No.	Signal
14	PIO0
15	PIO1
16	PIO2
17	PIO3
18	LED 100M
19	DCD0
20	DSR0
21	DTR0
22	GND
23	Ready LED
24	+5V
25	+5V
26	RxD1

(45 × 36 mm, 26-pin DIL package, 2.54 mm pitch)

Specifications

Form Factor

Type:
NE-4110/4120: Ready-to-go stand-alone modules
NE-4100T: 26-pin dual-in-line package

Dimensions:
NE-4110/4120: 57 × 40 mm (2.24 x 1.57 in)
NE-4100T: 45 × 36 mm (1.77 x 1.42 in)

Weight:
NE-4110S/4110A: 40 g
NE-4120S/4120A/4100T: 20 g

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, auto MDI/MDIX

Connector:
NE-4110 Series: RJ45
NE-4120 Series: 5-pin pin header
NE-4100T: 26-pin dual-in-line

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 2

Serial Standards:
Port 1:
NE-4110S/4120S: RS-232
NE-4110A/4120A: RS-422, RS-485-4w, RS-485-2w
NE-4100T: TTL
Port 2:
TTL console port

RS-485 Flow Control: ADDC® (automatic data direction control)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: DSR/DTR and RTS/CTS (RS-232 only), XON/XOFF

Baudrate: 110 bps to 230.4 Kbps

Serial Signals

TTL:
Port 1: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
Port 2: TxD, RxD, GND

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

RS-485-2w: Data+, Data-, GND

Digital I/O Pins

GPIO: 4 programmable I/O pins

Software

Network Protocols: ICMP, ARP, IP, TCP, UDP, DHCP, Telnet, HTTP, SNMP V1/V2c, SMTP

Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Operation Modes: Real COM, TCP Server, TCP Client, UDP

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 70°C (-4 to 158°F)

Power Requirements

Input Voltage: 5 VDC (±5%)

Power Consumption: 290 mA @ 5 VDC max.

Regulatory Approvals

EMC: CE EN55022 Class A, FCC Part 15 Subpart B Class A

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (meantime between failures):
NE-4100T: 288173 hrs
NE-4110A: 289573 hrs
NE-4110S: 290276 hrs
NE-4120A: 289573 hrs
NE-4120S: 285874 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Ordering Information

Available Modules

NE-4110S: Device server module for RS-232 devices, supports 10/100BaseT(x) with RJ45 connector

NE-4110A: Device server module for RS-422/485 devices, supports 10/100BaseT(x) with RJ45 connector

NE-4120S: Device server module for RS-232 devices, supports 10/100BaseT(x) with 5-pin Ethernet pin header

NE-4120A: Device server module for RS-422/485 devices, supports 10/100BaseT(x) with 5-pin Ethernet pin header

NE-4100T: Device server module for TTL devices, supports 10/100BaseT(x) with DIL package

Available Starter Kits

NE-4110-ST: Starter kit for the NE-4110S and NE-4110A

NE-4120-ST: Starter kit for the NE-4120S and NE-4120A

NE-4100-ST: Starter kit for the NE-4100T

Package Checklist (modules)

- NE-4100 series module

Package Checklist (starter kits)

- NE-4100-ST or NE-4110-ST or NE-4120-ST evaluation board
- Universal power adaptor
- 2 power cords
- Null modem cable
- Cross-over Ethernet cable
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

WE-2100T Series

Wireless LAN embedded serial device servers

- Connects serial devices to IEEE 802.11a/b/g networks
- Choice of operation modes: Real COM, TCP Server, TCP Client, UDP, and RFC2217
- Windows (including Vista!) real COM and Linux fixed TTY drivers provided
- Wireless security with WEP, WPA, and WPA2
- Select any baudrate between 50 bps and 921.6 Kbps
- 9 programmable digital I/O channels
- SSL/SSH encryption for configuration
- Compact size and easily mounted housing

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The WE-2100T is a secure and compact embedded wireless module for connecting serial devices to access points in infrastructure mode, or to other WE-2100T's in ad-hoc mode. When using the WE-2100T, complex RF know-how is not needed to connect serial devices to a wireless Ethernet network. Encryption for secure data transfer is supported, along with the 802.11a/b/g radio specifications.

Operation Modes for Embedded Applications

The WE-2100T supports Real COM, TCP Server, TCP Client, UDP, and RFC 2217 operation modes, which are designed to fulfill the requirements of embedded module applications. Complete driver support for Real COM mode is included and easy to install.

On-site Configuration with Serial Command Mode

- Easy on-site configuration of network settings
- Simple command frame format
- Comprehensive command set for serial and network configuration
- Easily switch between software and hardware triggers
- Software reset

Specifications

Form Factor

Type: Small metal housing that encloses advanced ARM-based 32-bit processor; supports both wireless and Ethernet connections

Dimensions: 54 x 40 x 13.3 mm (2.13 x 1.57 x 0.52 in)

Weight: 100 g

Automatic Network Selection

Wireless or Ethernet: The WE-2100T will activate the Ethernet connection if detected at boot-up. If an Ethernet connection is not detected, the WE-2100T will choose wireless as the communication interface. Which interface to use can also be configured with the WE-2100T's configuration utilities.

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: 44-pin dual-in-line

Magnetic Isolation Protection: 1.5 KV built-in

WLAN Interface

Standard Compliance: IEEE 802.11a/b/g

Network Mode: Infrastructure mode (a/b/g), Ad-Hoc mode (b/g)

Spread Spectrum Technology: DSSS, CCK, OFDM

Transmit Power:
5.15 to 5.25 GHz: 15 dBm @ 6 Mbps; 12 dBm @ 54 Mbps 5.725 to 5.825 GHz: 15 dBm @ 6 Mbps; 12 dBm @ 54 Mbps
2.412 to 2.483 GHz: 17 dBm @ 6 Mbps; 15 dBm @ 54 Mbps
2.412 to 2.472 GHz: 18 dBm @ 1 to 11 Mbps

Receive Sensitivity:
5.15 to 5.25 GHz: 6 Mbps @ -90 dBm; 54 Mbps @ -72 dBm
5.725 to 5.825 GHz: 6 Mbps @ -89 dBm; 54 Mbps @ -72 dBm
2.412 to 2.483 GHz: 6 Mbps @ -90 dBm; 54 Mbps @ -73 dBm
2.412 to 2.472 GHz: 11 Mbps @ -87 dBm; 1 Mbps @ -94 dBm

Transmission Rate:
802.11a: 54 Mbps
802.11b: 11 Mbps
802.11g: 54 Mbps

Transmission Distance: Up to 100 meters (in open areas)

Wireless Security: AES, WEP 64/128-bit, WPA, WPA2, PSK, 802.11i

802.11i Authentication: TLS, PEAP/GTC, PEAP/MD5, PEAP/MSCHAPv2, TTLS/PAP, TTLS/CHAP, TTLS/MSCHAP, TTLS/MSCHAPv2, TTLS/EAP-MSCHAPv2, TTLS/EAP-GTC, TTLS/EAP-MD5, LEAP

Channels:
North America: CH1 to CH11, 5150-5825 MHz
Europe: CH1 to CH13, 5150-5875 MHz
Japan: CH1 to CH14, 5150-5350 MHz

Antenna Connector: Reverse SMA

Antenna Gain: 2 DBi

Serial Interface

Number of Ports: 1

Serial Standards:
Port 1: TTL
Port 2: TTL console port

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: DSR/DTR and RTS/CTS (RS-232 only), XON/XOFF

Baudrate: 50 bps to 921.6 Kbps (non-standard buadrates supported)

Serial Signals

TTL:
Port 1: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
Port 2: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, SSH, HTTPS

Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility, Serial command mode (configured through the data port)

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Operation Modes: Real COM, TCP Server, TCP Client, UDP, RFC2217

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 70°C (-4 to 158°F)

Surface Temperature (at full baudrate of 921.6 Kbps)

Top Panel:
43.0°C, when air temp = 25°C
55.0°C, when air temp = 55°C

Bottom Panel:
44.5°C, when air temp = 25°C
67.0°C, when air temp = 55°C

Power Requirements

Input Voltage: 3.3 VDC (±5%)

Power Consumption:
921.6 Kbps (full speed): 540 mA
Idle: 190 mA
Ethernet mode: 670 mA
Inrush current: 2100 mA

Regulatory Approvals

EMC: CE (EN55022 and EN55024 Class A, ETSI EN 301 489-17, ETSI EN 301 489-1)

Safety: UL (UL60950-1), TÜV (EN60950-1)

EMI: FCC Part 15 (Subpart B Class A, Subpart C, Subpart E)

Radio: CE (ETSI EN 301 893, ETSI EN 300 328), ARIB RCR STD-33, ARIB STD-66

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

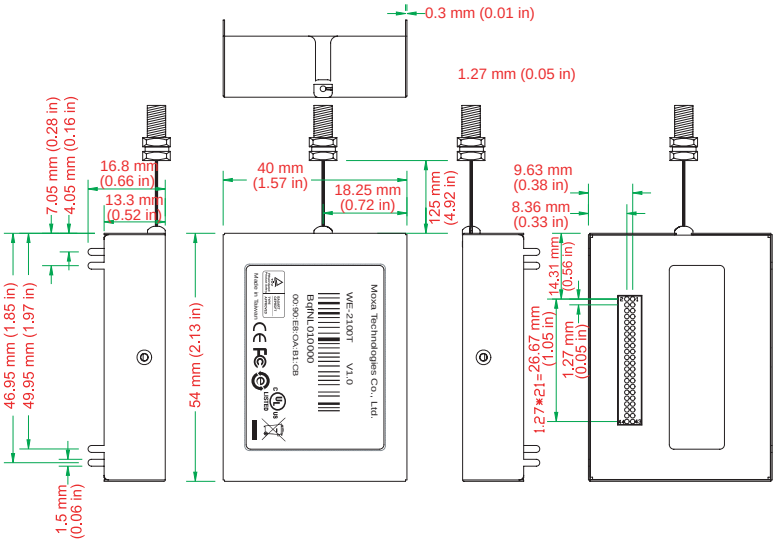
MTBF (meantime between failures):
WE-2100T: 505288 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions and Pin Assignment



3.3V	1	2	GND
3.3V	3	4	GND
3.3V	5	6	GND
Console_TxD	7	8	Console_RxD
Console_RTS	9	10	Console_CTS
Console_DTR	11	12	Console_DSR
PIO0	13	14	Console_DCD
PIO1	15	16	PIO4(WLAN strength 1)
PIO2	17	18	PIO5(WLAN strength 2)
PIO3	19	20	PIO6(WLAN strength 3)
Data_TxD	21	22	PIO7(WLAN strength 4)
Data_RTS	23	24	Data_RxD
Data_DTR	25	26	Data_CTS
Ready_LED	27	28	Data_DSR
Fault_LED	29	30	Data_DCD
Eth_Tx+	31	32	WLAN_Active_LED
Eth_Tx-	33	34	SW_RESET
Eth_Center_TAP	35	36	HW_RESET
Eth_Center_TAP	37	38	Eth_100M_LED
Eth_Rx+	39	40	Eth_10M_LED
Eth_Rx-	41	42	Reserved
PIO8(WLAN strength 0)	43	44	Reserved

Ordering Information

Available Modules

WE-2100T: 1-port wireless module supporting IEEE 802.11a/b/g

Available Starter Kits

WE-2100T-ST: Starter Kit for the WE-2100T

Package Checklist (module)

- WE-2100T wireless module
- IEEE 802.11a/b/g Antenna

Package Checklist (starter kit)

- WE-2100T-ST evaluation board
- WE-2100T wireless module
- Power adaptor
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Ethernet Fieldbus Gateways

Product Selection Guides

Ethernet Fieldbus Gateways. 9-2

Ethernet Fieldbus Gateways

Introduction to Modbus Gateways 9-4

MGate™ MB3170/3270 Advanced serial-to-Ethernet Modbus gateways 9-8

MGate™ MB3180/3280/3480 Standard Modbus gateways 9-11

MGate™ EIP3000 Series DF1 to Ethernet/IP gateways 9-13

Ethernet Fieldbus Gateways

	MGate™ MB3170 MGate™ MB3170-T	MGate™ MB3170I MGate™ MB3170I-T	MGate™ MB3270 MGate™ MB3270-T	MGate™ MB3270I MGate™ MB3270I-T	MGate™ MB3180	MGate™ MB3280	MGate™ MB3480
Ethernet Interface							
Number of Ports	2 (1 IP)	2 (1 IP)	2 (1 IP)	2 (1 IP)	1	1	1
Speed	10/100 Mbps	10/100 Mbps	10/100 Mbps	10/100 Mbps	10/100 Mbps	10/100 Mbps	10/100 Mbps
Connector	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface							
Number of Ports	1	1	2	2	1	2	4
Serial Standards	RS-232/422/485	RS-232/422/485	RS-232/422/485	RS-232/422/485	RS-232/422/485	RS-232/422/485	RS-232/422/485
Connectors	RS-232: DB9-M; RS-422/485: Terminal Block		DB9-M	DB9-M	DB9-M	DB9-M	DB9-M
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
RS-485 Data Direction Control	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®
Serial Communication Parameters	Data Bits: 7, 8; Stop Bits: 1, 2; Parity: None, Even, Odd, Space, Mark						
Parity	None, Even, Odd, Space, Mark						
Flow Control	RTS/CTS, DTR/DSR (RS-232 only)						
Baudrate	50 bps to 921.6 Kbps						
Software							
Operation Modes	RTU Slave, RTU Master, ASCII Slave, ASCII Master						
Utilities	MGate™ Manager Suite for Windows 98, ME, NT, 2000, XP, 2003, Vista						
Smart Routing	√	√	√	√	√	√	√
Serial Redirection	√	√	√	√	---	---	---
Priority Control	√	√	√	√	---	---	---
Ethernet Protocol	---	---	---	---	---	---	---
Serial Protocol	---	---	---	---	---	---	---
Physical Characteristics							
Housing	Plastic	Plastic	Plastic	Plastic	Metal	Metal	Metal (IP30)
Dimensions	29 x 89.2 x 118.5 mm				22 x 52 x 80 mm	22 x 77 x 111 mm	35.5 x 103 x 158 mm
Environmental Limits							
Operating Temperature	0 to 55°C or -40 to 75°C				0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-40 to 85°C	-40 to 85°C	-40 to 85°C	-40 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C
Power Requirements							
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Power Connector	Terminal block	Terminal block	Terminal block	Terminal block	Power jack	Power jack and terminal block	
Regulatory Approvals							
EMC	CE (EN55022 Class A and EN55024), FCC Part 15 Subpart B Class A						
Safety	UL (UL60950-1), TÜV (EN60950-1)						
Hazardous Location	UL/cUL Class 1 Division 2 Groups A, B, C, D; ATEX Class 1 Zone 2				---	---	---
Shock	IEC 60068-2-27				---	---	---
Freefall	IEC 60068-2-23				---	---	---
Vibration	IEC 60068-2-6				---	---	---
Marine	DNV				---	---	---
EMS	EN61000-4-2 (ESD): Level 3 EN61000-4-3 (RS): Level 3 EN61000-4-4 (EFT): Level 4 EN61000-4-5 (Surge): Level 3 EN61000-4-6 (CS): Level 3 EN61000-4-8: Passed EN61000-4-11: Passed EN61000-4-12: Passed				EN61000-4-2 (ESD): Level 2 EN61000-4-3 (RS): Level 2 EN61000-4-4 (EFT): Level 2 EN61000-4-5 (Surge): Level 2 EN61000-4-6 (CS): Level 2 EN61000-4-8: Passed EN61000-4-11: Passed EN61000-4-12: Passed		
Reliability							
Warranty	5 years (see www.moxa.com/warranty)						

Ethernet Fieldbus Gateways

	MGate™ EIP3170 MGate™ EIP3170-T	MGate™ EIP3170I MGate™ EIP3170I-T	MGate™ EIP3270 MGate™ EIP3270-T	MGate™ EIP3270I MGate™ EIP3270I-T
Ethernet Interface				
Number of Ports	2 (1 IP)	2 (1 IP)	2 (1 IP)	2 (1 IP)
Speed	10/100 Mbps	10/100 Mbps	10/100 Mbps	10/100 Mbps
Connector	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface				
Number of Ports	1	1	2	2
Serial Standards	RS-232/422	RS-232/422	RS-232/422	RS-232/422
Connectors	DB9-M (RS-232), TB (RS-422)	DB9-M (RS-232), TB (RS-422)	DB9-M	DB9-M
ESD Protection	15 KV	15 KV	15 KV	15 KV
RS-485 Data Direction Control	ADDC®	ADDC®	ADDC®	ADDC®
Serial Communication Parameters	Data Bits: 7, 8; Stop Bits: 1, 2; Parity: None, Even, Odd, Space, Mark			
Parity	None, Even, Odd, Space, Mark			
Flow Control	RTS/CTS, DTR/DSR			
Baudrate	50 bps to 921.6 Kbps			
Software				
Operation Modes	---	---	---	---
Utilities	MGate™ Manager Suite for Windows 98, ME, NT, 2000, XP, 2003, Vista			
Smart Routing	√	√	√	√
Serial Redirection	---	---	√	√
Priority Control	---	---	---	---
Ethernet Protocol	CIP (PCCC) on Ethernet/IP	CIP (PCCC) on Ethernet/IP	CIP (PCCC) on Ethernet/IP	CIP (PCCC) on Ethernet/IP
Serial Protocol	DF1 Full-duplex	DF1 Full-duplex	DF1 Full-duplex	DF1 Full-duplex
Physical Characteristics				
Housing	Plastic	Plastic	Plastic	Plastic
Dimensions	29 x 89.2 x 118.5 mm	29 x 89.2 x 118.5 mm	29 x 89.2 x 118.5 mm	29 x 89.2 x 118.5 mm
Environmental Limits				
Operating Temperature	0 to 55°C or -40 to 75°C	0 to 55°C or -40 to 75°C	0 to 55°C or -40 to 75°C	0 to 55°C or -40 to 75°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C
Power Requirements				
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Power Connector	Terminal block	Terminal block	Terminal block	Terminal block
Regulatory Approvals				
EMC	CE (EN55022 Class A and EN55024), FCC Part 15 Subpart B Class A			
Safety	UL (UL60950-1), LVD (EN60950-1)			
Hazardous Location	UL/cUL Class 1 Division 2 Groups A, B, C, D; ATEX Class 1 Zone 2			
Shock	IEC60068-2-27			
Freefall	IEC60068-2-23			
Vibration	IEC60068-2-6			
Marine	---	---	---	---
EMS	EN61000-4-2 (ESD): Level 3 EN61000-4-3 (RS): Level 3 EN61000-4-4 (EFT): Level 4 EN61000-4-5 (Surge): Level 3 EN61000-4-6 (CS): Level 3 EN61000-4-8: Passed EN61000-4-11: Passed EN61000-4-12: Passed			
Reliability				
Warranty	5 years (see www.moxa.com/warranty)			

Introduction to Modbus Gateways

Seamless communication between Modbus Ethernet and Modbus serial devices

Modbus is the standard used for communication between a wide range of industrial devices, including PLCs, DCSs, HMIs, instruments, meters, motors, and drives. Although Modbus can be used for both serial (RS-232, RS-422, and RS-485) devices and newer Ethernet devices, the serial and Ethernet protocols are so different that a specialized gateway is required for one protocol to communicate with the other. Moxa's MGate™ products are specially designed to integrate Modbus TCP and Modbus RTU/ASCII networks. MGate™ MB3000 products support one or two Ethernet connections, and up to four serial ports.

The MGate™ line of Modbus gateways includes products that support these advanced features:

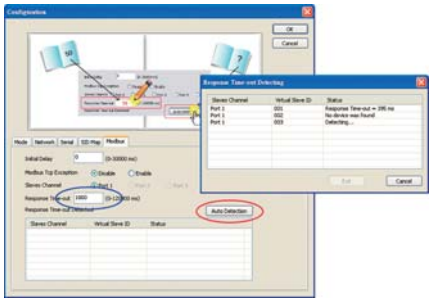
- Multiple masters
- Priority control
- Smart routing
- Serial redirector
- Powerful Windows Utility

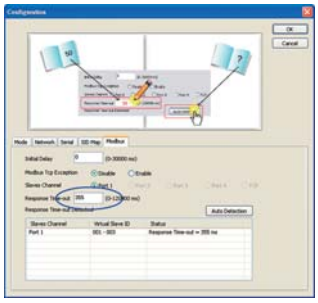
Powerful Options for Master/Slave Configuration between Modbus Networks

Devices connected to a Modbus network must be clearly defined as either "master" or "slave." Unlike other Modbus gateways, the MGate™ MB3000 allows protocol conversion in two directions, from Ethernet master to serial slave and from serial master to Ethernet slave. To ensure maximum compliance with all Modbus networks, extra address mapping and exception parameters can be adjusted to handle almost any situation.

Easier Integration with Automatic Calibration of Response Timeout (patent pending)

Every Modbus device should be assigned a response timeout value, as provided by the device manufacturer based on the computation required for a request. However, manually obtaining and setting these values for every device is difficult and time-consuming, especially on complex networks with a large number of devices. The MGate™ MB3000 eliminates this difficulty with a patent-pending feature that automatically determines and sets each device's response timeout value.



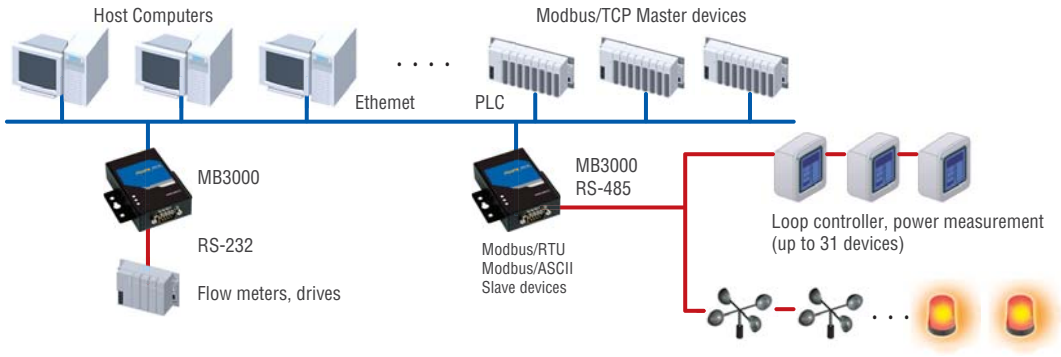


Automatic Calibration Provides these Important Benefits:
(1) Automatic calibration of the timeout value provides maximum compatibility with minimum effort.
(2) Automatic calibration eliminates the need to either guess or calculate timeout values.

Multiple Masters across Different Modbus Networks for Fully Compliant Operation

The MGate™ MB3000 supports 16 simultaneous TCP masters with up to 32 simultaneous requests per master. Serial masters are able to access up to 32 different IP addresses as TCP slaves. MGate™ MB3000 gateways have been designed so that even with multiple masters across different Modbus networks, communication remains compliant with each Modbus protocol.

Supports 16 TCP masters with up to 32 requests per master

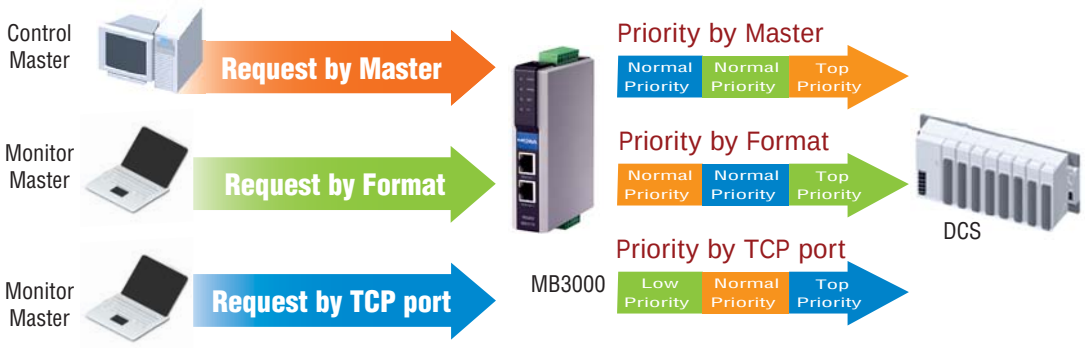


Built-in Optical Isolation for Industrial Device Protection

The MGate™ MB3000 series includes two advanced models—the MB3170 and MB3270—that offer built-in optical isolation of the serial signals as an option. Optical isolation helps prevent dangerous ground loops, spikes, and surges.

Priority Control for Critical Commands (patent pending)

Flag urgent commands for immediate response

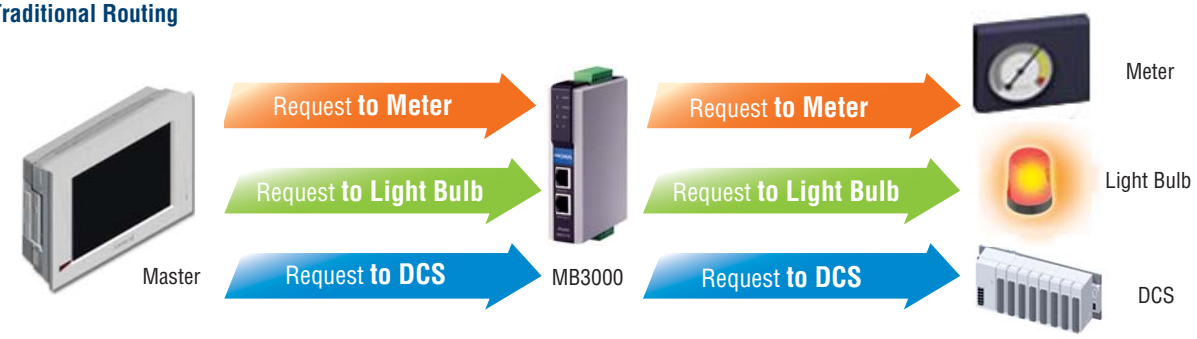


Other Modbus gateways simply transfer all requests between Modbus networks on a FIFO (first in first out) basis, with no accommodation for urgent commands that require immediate attention. The advanced models of the MGate™ MB3000 (the MB3170 and MB3270) include a patent-pending priority control feature that allows urgent commands to be flagged for immediate response based on IP address, command type, or TCP port. The priority control feature allows the advanced models of the MB3000 series to get around the latency experienced by other Modbus gateways. With the priority control feature, the advanced MB3000 models are an ideal component of real-time control systems.

No Change to Existing Architecture with Smart Routing and Serial Redirector

Automatic Routing

Traditional Routing



Smart Routing

The MGate™ MB3270, MB3280, and MB3480 include smart routing for enhanced compatibility with existing Modbus networks. Other Modbus gateways require a separate socket connection for each serial port, making them useless for TCP masters that can only open one connection. With smart routing on the MB3000 Modbus gateway, a TCP master can use just one socket connection to command serial slaves on every serial port.

The MGate™ MB3270 has a serial redirector function that allows additional options for Modbus network integration. The serial redirector function allows the commands of a serial master to be redirected to serial slaves on another port. In addition, a serial master can operate simultaneously with TCP masters or other serial masters, without altering the Modbus architecture or software. Using the serial redirector function, advanced MB3000 gateways can establish redundant backup control or Ethernet monitoring of Modbus networks that were originally designed for a single serial master.

Create a backup system

Powerful, Easy-to-use Windows Configuration Utility

MGate™ Manager is a Windows utility that enables you to do the following:

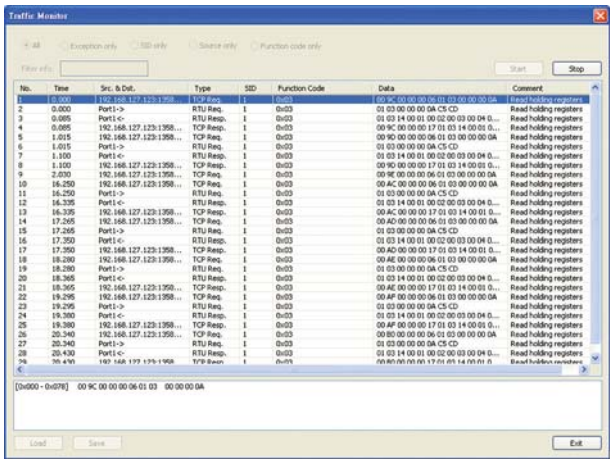
- Search for all MB3000 gateways on a LAN
- Remotely configure MB3000 gateways
- Monitor devices attached to MB3000 gateways
- Remotely upgrade the firmware on MB3000 gateways

Multi-language Support

MGate™ Manager is designed for configuration and monitoring of MB3000 gateways. The HMI of this utility is easily customized to display commands in the language of your choice.

Protocol Analysis Tool for all Modbus Communication

The monitor function can be used to log all Modbus commands and responses that pass through the MB3000 gateway. All data is presented in a clear, easy-to-understand format, and logs can be filtered for easier analysis. With a single click, users can view exceptions, specific slave IDs, traffic to/from specific sources (serial ports, IPs), or all traffic.



MGate™ MB3170/3270

1 and 2-port advanced serial-to-Ethernet Modbus gateways

- Configuration is exceptionally easy
- Slave mode supports 16 TCP masters and up to 62 serial slaves at the same time
- Master mode supports 32 TCP slaves at the same time
- Emergency request tunnels ensure QoS control
- Serial redirector function provided
- Embedded Modbus protocol analyzer
- Redundant dual DC power inputs
- Built-in Ethernet cascading for easy wiring

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

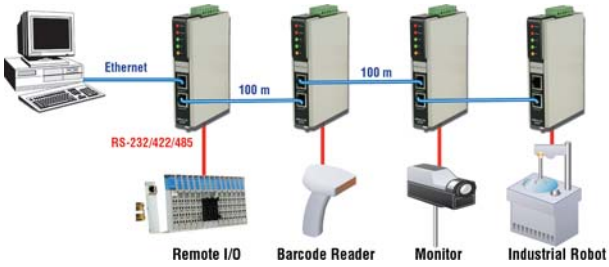
The MB3170 and MB3270 are advanced Modbus gateways that provide maximum flexibility for integrating industrial Modbus networks of all types and sizes. They are designed to integrate Modbus TCP, ASCII, and RTU devices in almost any master and slave combination, including serial master to serial slave, or simultaneous serial and Ethernet masters. A special priority control feature allows urgent commands to obtain immediate response. All models are ruggedly constructed, are DIN-rail mountable, and offer built-in optical isolation for serial signals as an option.

Integrate TCP Masters without Altering the Modbus RTU/ASCII Network or Software

The MB3270 can integrate Modbus TCP with Modbus RTU/ASCII, without modifying the existing Modbus RTU/ASCII architecture or software. With the serial redirector function, a serial master can maintain direct access to serial slave devices through a specially mapped serial port. This allows the serial and TCP masters to access serial slaves simultaneously.

Cascade Ethernet Ports for Easy Wiring

Advanced models of the MGate™ MB3000 series have two Ethernet ports to make network wiring easier. Dual Ethernet ports allow users to string multiple Modbus gateways together using standard RJ45 Ethernet cables, eliminating the need for a separate Ethernet switch.



Redundant Power Inputs

Advanced models of the MB3000 series have dual power inputs for greater reliability. The power inputs allow simultaneous connections to two live DC power sources, so that continuous operation is provided even if one power source fails. The higher level of reliability makes these advanced Modbus gateways ideal for demanding industrial applications.

Warning by Relay Output

A relay output is provided for the Ethernet link and power input status. The relay output gives maintenance engineers an additional tool for troubleshooting and maintenance.

Priority Control for Urgent Commands (patent pending)

As Modbus networks increase in size and complexity, the lag time between commands and responses becomes a major concern. Advanced models of the MB3000 series provide a priority control function for urgent commands, allowing users to force certain commands to get an immediate response. Depending on your system's requirements, different methods are available to define which commands receive priority.

Specifications

Ethernet Interface

Number of Ports: 2 (1 IP)

Speed: 10/100 Mbps, Auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports:
MB3170/3170I: 1
MB3270/3270I: 2

Serial Standards: RS-232/422/485, software selectable

Connectors:
MB3170/3170I: DB9 male for RS-232, Terminal block for RS-422/485
MB3270/3270I: DB9 male x 2

ESD Protection: 15 KV for all signals

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Terminator for RS-485: 120 Ω

Serial Communication Parameters

Data Bits: 7, 8

Stop Bits: 1, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, DTR/DSR (RS-232 only)

Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

RS-485-2w: Data+, Data-, GND

Software

Operation Modes: RTU Slave, RTU Master, ASCII Slave, ASCII Master

Utilities: MGate™ Manager Suite for Windows 98, ME, NT, 2000, XP, 2003, Vista

Multi-master and Multi-drop:
Master mode: 32 TCP slaves
Slave mode: 16 TCP masters (request queue 32-deep for each master)

Bonus Features: Smart Routing, Serial Redirection, Priority Control

Physical Characteristics

Housing: Plastic

Dimensions:
Without ears: 29 x 89.2 x 118.5 mm (1.14 x 3.51 x 4.67 in)
With ears extended: 29 x 89.2 x 124.5 mm (1.14 x 3.51 x 4.90 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Connector: Terminal block

Regulatory Approvals

EMC: CE (EN55022 Class A and EN55024), FCC Part 15 Subpart B Class A

Safety: UL (UL60950-1), TÜV (EN60950-1)

Hazardous Location:
UL/cUL Class 1 Division 2 Groups A, B, C, D
ATEX Class 1 Zone 2

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-23

Vibration: IEC 60068-2-6

Marine: DNV

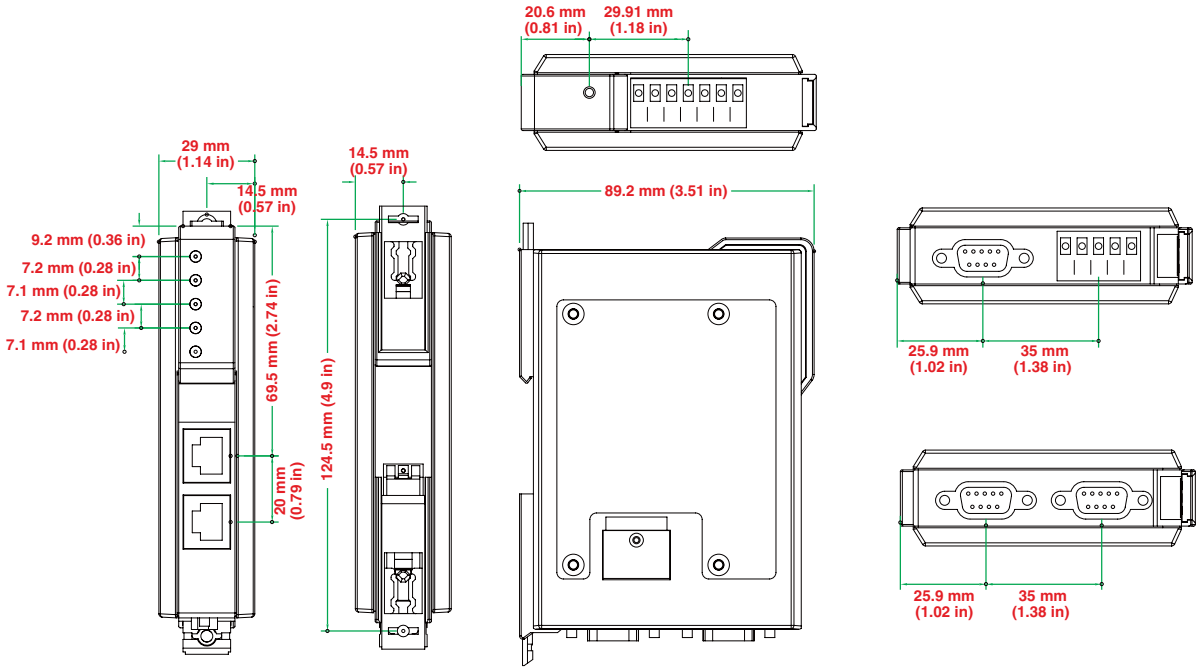
EMS:
EN61000-4-2 (ESD): Level 3
EN61000-4-3 (RS): Level 3
EN61000-4-4 (EFT): Level 4
EN61000-4-5 (Surge): Level 3
EN61000-4-6 (CS): Level 3
EN61000-4-8: Passed
EN61000-4-11: Passed
EN61000-4-12: Passed

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Available Models

MGate™ MB3170: 1-port advanced Modbus gateway, 0 to 55°C operating temperature
MGate™ MB3170I: 1-port advanced Modbus gateway with 2 KV isolation, 0 to 55°C operating temperature
MGate™ MB3270: 2-port advanced Modbus gateway, 0 to 55°C operating temperature
MGate™ MB3270I: 2-port advanced Modbus gateway with 2 KV isolation, 0 to 55°C operating temperature
MGate™ MB3170-T: 1-port advanced Modbus gateway, -40 to 75°C operating temperature
MGate™ MB3170I-T: 1-port advanced Modbus gateway with 2 KV isolation, -40 to 75°C operating temperature
MGate™ MB3270-T: 2-port advanced Modbus gateway, -40 to 75°C operating temperature
MGate™ MB3270I-T: 2-port advanced Modbus gateway with 2 KV isolation, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DR-45-24: 24 VDC DIN-rail power supply (2 A @ 45 W) with universal 85 to 264 VAC input
DR-75-24: 24 VDC DIN-rail power supply (3.2 A @ 75 W) with universal 85 to 264 VAC input
DR-120-24: 24 VDC DIN-rail power supply (5 A @ 120 W) with switch for choosing 88 to 132 VAC, or 176 to 264 VAC input

Package Checklist

- MGate™ MB3170 or MB3170I or MB3270 or MB3270I Modbus Gateway
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

MGate™ MB3180/3280/3480

1, 2, and 4-port standard Modbus gateways

- Convert between Modbus TCP and Modbus RTU/ASCII
- 1 Ethernet port and 1, 2, or 4 RS-232/422/485 ports
- 16 simultaneous TCP masters with up to 32 simultaneous requests per master
- Easy hardware setup and configuration

The certification logos shown here apply to some or all of the products in this section. For details, see “Regulatory Approvals” under “Specifications” below.

Overview

The MB3180, MB3280, and MB3480 are standard Modbus gateways that convert between Modbus TCP and Modbus RTU/ASCII protocols. Up to 16 simultaneous Modbus TCP masters are supported, with up to 31 RTU/ASCII slaves per serial port. For RTU/ASCII masters, up to 32 TCP slaves are supported.

Standard Modbus Network Integration

The three standard MGate™ models (MB3180, MB3280, and MB3480) are designed for easy integration of Modbus TCP and RTU/ASCII networks. With these models, Modbus serial slave devices can be seamlessly incorporated into an existing Modbus TCP network, and Modbus TCP slaves can be made accessible to serial masters. The MB3180, MB3280, and MB3480 offer features that make network integration easy, customizable, and compatible with almost any Modbus network.

High Density, Cost-effective Gateways

The MGate™ MB3000 gateways can effectively connect a high density of Modbus nodes to the same network. The MB3280 can manage up to 62 serial slave nodes, and the MB3480 can manage up to 124 serial slave nodes. Each RS-232/422/485 serial port can be configured individually for Modbus RTU or Modbus ASCII operation and for different baudrates, allowing both types of networks to be integrated with Modbus TCP through one Modbus gateway.

Specifications

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, Auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports:
MB3180: 1
MB3280: 2
MB3480: 4

Serial Standards: RS-232/422/485, software selectable

Connectors: DB9 male

ESD Protection: 15 KV for all signals

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Serial Communication Parameters

Data Bits: 7, 8

Stop Bits: 1, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, DTR/DSR

Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

RS-485-2w: Data+, Data-, GND

Software

Operation Modes: RTU Slave, RTU Master, ASCII Slave, ASCII Master

Utilities: MGate™ Manager Suite for Windows 98, ME, NT, 2000, XP, 2003, Vista

Multi-master and Multi-drop:
Master mode: 32 TCP slaves
Slave mode: 16 TCP masters (request queue 32-deep for each master)

Bonus Feature: Smart Routing

Physical Characteristics

Housing:
MB3180/3280: Metal
MB3480: Metal, IP30 protection

Dimensions:
Without ears:
MB3180: 22 x 52 x 80 mm (0.87 x 2.05 x 3.15 in)
MB3280: 22 x 77 x 111 mm (0.87 x 3.03 x 4.37 in)
MB3480: 35.5 x 103 x 158 mm (1.40 x 4.06 x 6.22 in)
With ears:
MB3180: 22 x 75.2 x 80 mm (0.87 x 2.96 x 3.15 in)
MB3280: 22 x 100 x 111 mm (0.87 x 3.94 x 4.37 in)
MB3480: 35.5 x 103 x 181 mm (1.40 x 4.06 x 7.14 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-4 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Connector:
MGate™ MB3180: Power jack
MGate™ MB3280/3480: Power jack and terminal block

Regulatory Approvals

EMC: CE (EN55022 Class A and EN55024), FCC Part 15 Subpart B Class A

Safety: UL (UL60950-1), TÜV (EN60950-1)

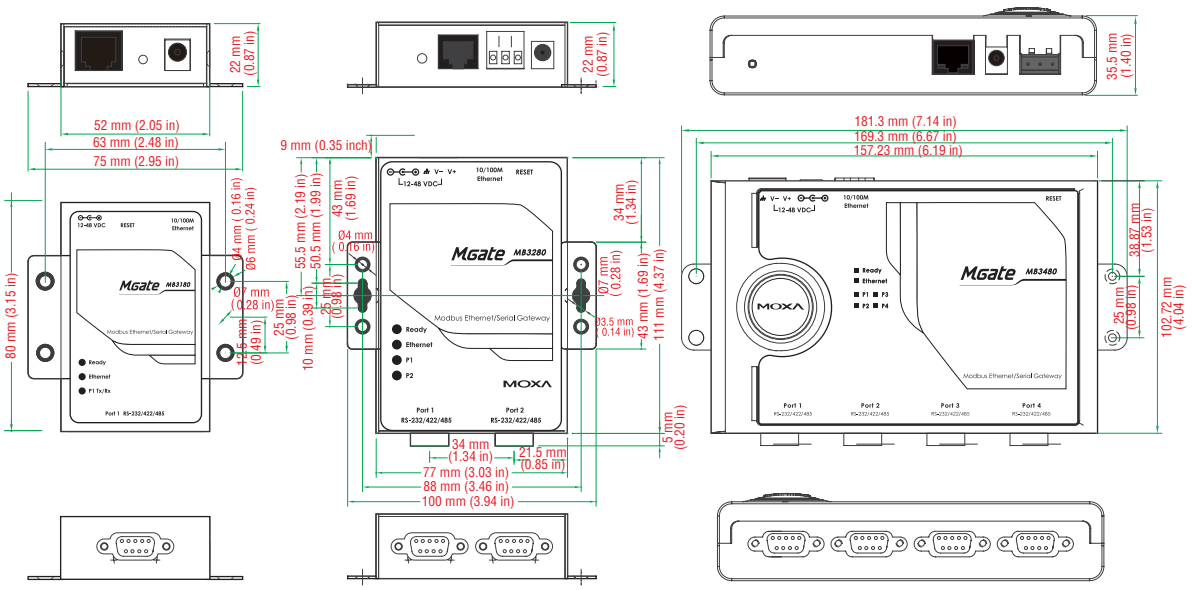
EMS:
EN61000-4-2 (ESD): Level 2
EN61000-4-3 (RS): Level 2
EN61000-4-4 (EFT): Level 2
EN61000-4-5 (Surge): Level 2
EN61000-4-6 (CS): Level 2
EN61000-4-8: Passed
EN61000-4-11: Passed
EN61000-4-12: Passed

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Available Models

MGate™ MB3180: 1-port standard Modbus gateway
MGate™ MB3280: 2-port standard Modbus gateway
MGate™ MB3480: 4-port standard Modbus gateway

Optional Accessories (can be purchased separately)

DK-35A: Mounting kit for 35-mm DIN-rail

Package Checklist

- MGate™ MB3180 or MB3280 or MB3480 Modbus Gateway
- Power Adaptor
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

MGate™ EIP3000 Series

1 and 2-port DF1 to Ethernet/IP gateways

- PCCC objects for Rockwell Automation networks supported
- 8 simultaneous Ethernet/IP clients with up to 16 simultaneous requests per client
- Serial redirector function provided
- Virtual serial port for multiple DF1 and Ethernet/IP device communication
- Embedded Ethernet/IP and DF1 protocol analyzer
- Redundant dual DC power inputs
- Built-in Ethernet cascading for easy wiring

Overview

MGate™ EIP3000 series products provide 1 or 2-port DF1 to Ethernet/IP protocol conversion for users who need to connect Allen Bradley PLCs to an Ethernet/IP network, and provide a cost-effective way to combine PLC and SCADA software into the same system.

Protocol Conversion between DF1 and Ethernet/IP

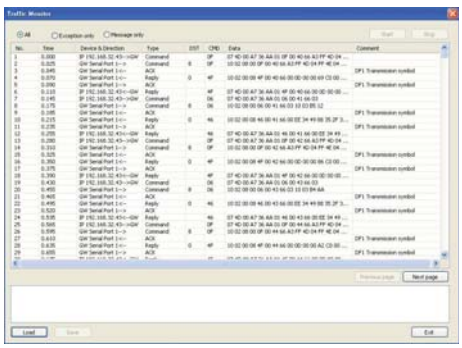
MGate™ EIP3000 series products can be used to connect DF1 devices and Ethernet/IP devices to provide Allen Bradley PLCs with remote maintenance capability. By supporting PCCC objects on CIP, the MGate™ EIP3000 can communicate seamlessly with Rockwell Ethernet devices. The EIP3000 protocol gateways come with either 1 or 2 serial ports to allow users to select a suitable gateway depending on the size of the network.

Support for Multiple Ethernet/IP Connections

The MGate™ EIP3000 series products support up to 8 Ethernet/IP clients and 8 Ethernet/IP servers simultaneously. Each client can send up to 16 requests at one time.

Windows Utility for Easy Setup and Traffic Monitoring

Moxa provides a user-friendly Windows utility with multiple language support for use with all of our MGate™ products. The utility also supports a traffic monitoring function for Ethernet/IP and DF1 protocols.



Serial Redirector Function Provided

The MGate™ EIP3000 series products have a serial redirector function that allows additional options for DF1 network integration. The serial redirector function allows the commands of a serial master (command initiator) to be redirected to the serial slave (command executor) on another port. In addition, a serial master can operate simultaneously with Ethernet/IP Clients or other serial masters without altering the DF1 architecture or software. Using the serial redirector function, EIP3000 gateways can establish redundant backup control or Ethernet monitoring of DF1 networks that were originally designed for a single serial master.

Virtual Serial Port for Multiple DF1 and Ethernet/IP Device Communication

Each MGate™ EIP3000 gateway supports a virtual serial port. A remote PC uses a Moxa-provided Real COM or TTY driver to connect to the EIP3000's virtual serial port. RSLinx and SCADA systems can use the virtual COM port to communicate with an EIP3000 gateway. The virtual serial port function gives RSLinux or some SCADA systes the capability to connect to multiple DF1 and Ethernet/IP devices through a protocol gateway.

Pull high/low Resistors and Terminator Selection

When using termination resistors to prevent serial signal reflection, it is important to set the pull high/low resistors correctly so that the electrical signal is not corrupted. Since no set of resistor values is universally compatible with all environments, the EIP3000 has DIP switches on the bottom panel for setting the termination and pull high/low resistor values.

Built-in Isolation

Complex device networks that incorporate high amperage devices could be subject to electrical signal distortion from electrical discharges, magnetic noise, or common mode transients. MGate™ EIP series products solve this problem by using built-in optical isolation.

Specifications

Ethernet Interface

Number of Ports: 2 (sharing 1 IP)

Speed: 10/100 Mbps, Auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports:
EIP3170/3170I: 1
EIP3270/3270I: 2

Serial Standards: RS-232/422, software selectable

Connectors:
EIP3170/3170I: DB9 male for RS-232, terminal block for RS-422
EIP3270/3270I: DB9 male x 2

ESD Protection: 15 KV for all signals

Serial Communication Parameters

Data Bits: 7, 8

Stop Bits: 1, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, DTR/DSR

Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

Ethernet Protocol: CIP (PCCC) on Ethernet/IP

Serial Protocol: DF1 Full-duplex

Physical Characteristics

Housing: Plastic

Dimensions:
Without ears: 29 x 89.2 x 118.5 mm (1.14 x 3.51 x 4.67 in)
With ears extended: 29 x 89.2 x 124.5 mm (1.14 x 3.51 x 4.90 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-4 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Connector: Terminal block

Regulatory Approvals

EMC: CE (EN55022 Class A and EN55024), FCC Part 15 Subpart B Class A

Safety: UL (UL60950-1), LVD (EN60950-1)

Hazardous Location:
UL/cUL Class 1 Division 2 Groups A, B, C, D
ATEX Class 1 Zone 2

Shock: IEC60068-2-27

Freefall: IEC60068-2-23

Vibration: IEC60068-2-6

EMS:
EN61000-4-2 (ESD): Level 3
EN61000-4-3 (RS): Level 3
EN61000-4-4 (EFT): Level 4
EN61000-4-5 (Surge): Level 3
EN61000-4-6 (CS): Level 3
EN61000-4-8: Passed
EN61000-4-11: Passed
EN61000-4-12: Passed

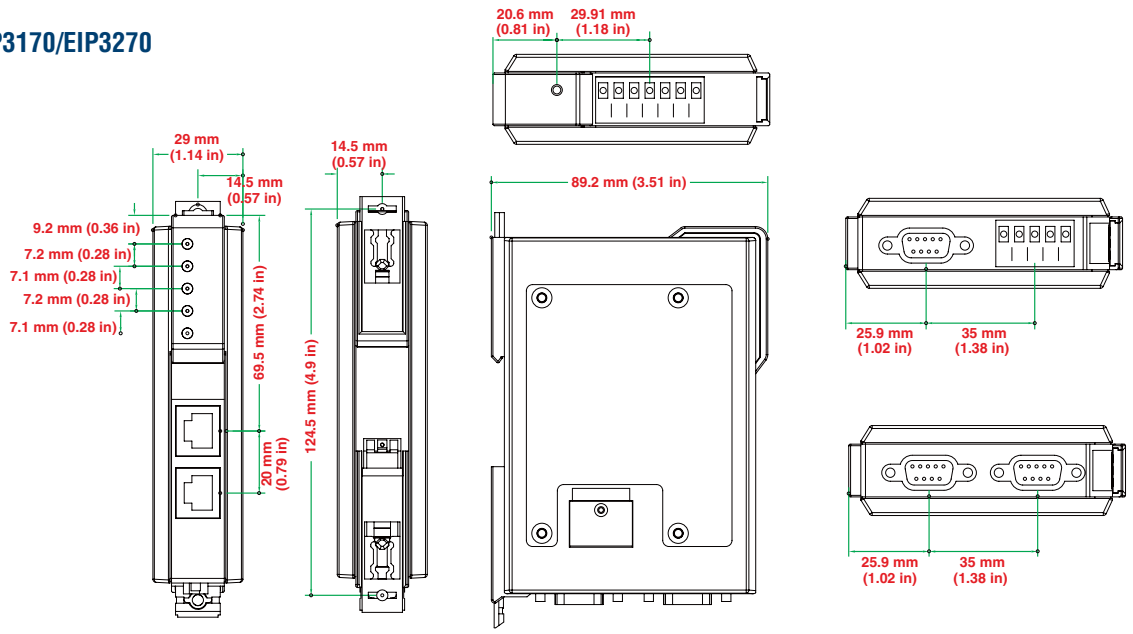
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions

EIP3170/EIP3270



Ordering Information

Available Models

MGate™ EIP3170: 1-port DF1 to Ethernet/IP gateway, 0 to 55°C operating temperature

MGate™ EIP3170I: 1-port DF1 to Ethernet/IP gateway with 2 KV isolation, 0 to 55°C operating temperature

MGate™ EIP3270: 2-port DF1 to Ethernet/IP gateway, 0 to 55°C operating temperature

MGate™ EIP3270I: 2-port DF1 to Ethernet/IP gateway with 2 KV isolation, 0 to 55°C operating temperature

MGate™ EIP3170-T: 1-port DF1 to Ethernet/IP gateway, -40 to 75°C operating temperature

MGate™ EIP3170I-T: 1-port DF1 to Ethernet/IP gateway with 2 KV isolation, -40 to 75°C operating temperature

MGate™ EIP3270-T: 2-port DF1 to Ethernet/IP gateway, -40 to 75°C operating temperature

MGate™ EIP3270I-T: 2-port DF1 to Ethernet/IP gateway with 2 KV isolation, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DR-45-24: 24 VDC DIN-rail power supply (2 A @ 45 W) with universal 85 to 264 VAC input

DR-75-24: 24 VDC DIN-rail power supply (3.2 A @ 75 W) with universal 85 to 264 VAC input

DR-120-24: 24 VDC DIN-rail power supply (5 A @ 120 W) with switch for choosing 88 to 132 VAC, or 176 to 264 VAC input

Package Checklist

- 1 MGate™ EIP3170 or EIP3170I or EIP3270 or EIP3270I Ethernet/IP gateway
- Quick installation guide (printed)
- Document and Software CD
- Warranty Card

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CP-132UL/UL-I 2-port RS-422/485 Universal PCI boards with 2 KV isolation 10-56
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PCI Express Serial Boards

	CP-118EL	CP-168EL	CP-114EL	CP-114EL-I	CP-104EL	CP-102E	CP-102EL	CP-132EL	CP-132EL-I
Hardware									
Comm. Controller	MU860		16C550C compatible		MU860	16C550C compatible			
Bus	PCI Express x1								
Connector	VHDCI 68		DB44 female			DB9 male	DB25 female		
Serial Interface									
RS-232 Ports	---	8	---	---	4	2	2	---	---
RS-422 Ports	---	---	---	---	---	---	---	---	---
RS-422/485 Ports	---	---	---	---	---	---	---	2	2
RS-232/422/485 Ports	8	---	4	4	---	---	---	---	---
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	RTS/CTS, XON/XOFF							XON/XOFF	
Baudrate	50 bps to 921.6 Kbps								
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Optical Isolation	---	---	---	2 KV	---	---	---	---	2 KV
Driver Support									
Windows 9X/ME/NT	---	---	---	---	---	---	---	---	---
Windows 2000	√	√	√	√	√	√	√	√	√
Windows XP/2003/Vista x86/x64	√	√	√	√	√	√	√	√	√
Windows 2008 x86/x64	√	√	√	√	√	√	√	√	√
Windows CE 5.0	√	√	---	---	√	---	---	---	---
Windows CE 6.0	---	---	---	---	---	---	---	---	---
Windows XP Embedded	√	√	√	√	√	√	√	√	√
DOS	√	√	---	---	√	---	---	---	---
Linux 2.4/2.6	√	√	√	√	√	√	√	√	√
FreeBSD 4/5	√	√	---	---	√	---	---	---	---
QNX 4	---	---	---	---	---	---	---	---	---
QNX 6	√	√	√	√	√	√	√	√	√
SCO Open Server 5/6	√	√	√	√	√	√	√	√	√
UnixWare 7	√	√	√	√	√	√	√	√	√
Environmental Factors									
Dimensions (mm)	64.4 x 132	62.7 x 102	67.2 x 136.9	67.2 x 136.9	62.7 x 100	85.0 x 100	67.2 x 102.0	67.2 x 102.0	67.2 x 104.0
Operating Temperature	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C
Regulatory Approvals									
FCC, Part 15 Class	B	B	B	B	B	B	B	B	B
EN55022 Class B	---	---	---	---	---	---	---	---	---
EN55022	---	---	---	---	---	---	---	---	---
EN55024	√	√	√	√	√	√	√	√	√
EN61000-3-2	√	√	√	√	√	√	√	√	√
EN61000-3-3	√	√	√	√	√	√	√	√	√
EN61000-6-2	√	√	√	√	√	√	√	√	√
EN61000-6-4	---	---	---	---	---	---	---	---	---
IEC 61000-4-2	√	√	√	√	√	√	√	√	√
IEC 61000-4-3	√	√	√	√	√	√	√	√	√
EC 61000-4-4	√	√	√	√	√	√	√	√	√
IEC 61000-4-5	√	√	√	√	√	√	√	√	√
IEC 61000-4-6	√	√	√	√	√	√	√	√	√
IEC 61000-4-8	√	√	√	√	√	√	√	√	√
IEC 61000-4-11	√	√	√	√	√	√	√	√	√
IEC 61000-4-11 (DIPS)	---	---	---	---	---	---	---	---	---
ENV5204	---	---	---	---	---	---	---	---	---
Reliability									
Warranty	5 years (see www.moxa.com/warranty)								

Universal PCI Serial Boards

	C320Turbo/PCI	C218Turbo/PCI	CP-118U CP-118U-T	CP-138U CP-138U-T	CP-118U-I CP-118U-I-T	CP-138U-I CP-138U-I-T	CP-168U CP-168U-T	CP-114UL CP-114UL-T	CP-114UL-I CP-114UL-I-T	CP-104UL CP-104UL-T
Hardware										
Comm. Controller	16C550C or compatible		MU860							
Bus	32-bit Universal PCI									
Connector	DB25 female	DB62 female			DB78 female		DB62 female	DB44 female		
Serial Interface										
RS-232 Ports	32	8	---	---	---	---	8	---	---	4
RS-422 Ports	---	---	---	---	---	---	---	---	---	---
RS-422/485 Ports	---	---	---	8	---	8	---	---	---	---
RS-232/422/485 Ports	---	---	8	---	8	---	---	4	4	---
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark									
Flow Control	---	---	RTS/CTS, XON/XOFF				RTS/CTS, XON/XOFF			
Baudrate	50 bps to 460.8 Kbps	50 bps to 921.6 Kbps								
ESD Protection	---	Optional	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Optical Isolation	---	Optional	---	---	2 KV	2 KV	Optional	---	2 KV	---
Driver Support										
Windows 9X/ME/NT	√	√	√	√	√	√	√	√	√	√
Windows 2000	√	√	√	√	√	√	√	√	√	√
Windows XP/2003/Vista x86/x64	√	√	√	√	√	√	√	√	√	√
Windows 2008 x86/x64	√	√	√	√	√	√	√	√	√	√
Windows CE 5.0	---	---	√	√	√	√	√	√	√	√
Windows CE 6.0	---	---	√	√	√	√	√	√	√	√
Windows XP Embedded	---	---	√	√	√	√	√	√	√	√
DOS	√	√	√	√	√	√	√	√	√	√
Linux 2.4/2.6	√	√	√	√	√	√	√	√	√	√
FreeBSD 4/5	---	---	√	√	√	√	√	√	√	√
QNX 4	√	√	---	---	---	---	---	---	---	---
QNX 6	√	√	√	√	√	√	√	√	√	√
SCO Open Server 5/6	√	√	√	√	√	√	√	√	√	√
UnixWare 7	√	√	√	√	√	√	√	√	√	√
Environmental Factors										
Dimensions (mm)	90 x 120	105 x 180	82 x 135	82 x 135	105 x 133	105 x 133	82 x 120	64.4 x 120	64.4 x 120	64.4 x 120
Operating Temperature	0 to 55°C	0 to 55°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C
Regulatory Approvals										
FCC, Part 15 Class	A	A	B	B	B	B	B	B	B	B
EN55022 Class B	---	---	---	---	---	---	---	---	---	---
EN55022	---	---	---	---	√	√	√	√	√	√
EN55024	---	---	√	√	√	√	√	√	√	√
EN61000-3-2	---	---	√	√	√	√	√	√	√	√
EN61000-3-3	---	---	√	√	√	√	√	√	√	√
EN61000-6-2	---	---	√	√	---	---	---	---	---	---
EN61000-6-4	---	---	---	---	---	---	---	---	---	---
IEC 61000-4-2	√	√	√	√	√	√	√	√	√	√
IEC 61000-4-3	√	√	√	√	√	√	√	√	√	√
IEC 61000-4-4	√	√	√	√	√	√	√	√	√	√
IEC 61000-4-5	---	√	√	√	√	√	√	√	√	√
IEC 61000-4-6	---	√	√	√	√	√	√	√	√	√
IEC 61000-4-8	---	---	√	√	√	√	√	√	√	√
IEC 61000-4-11	---	---	---	---	---	---	---	---	---	---
IEC 61000-4-11 (DIPS)	---	√	√	√	√	√	√	√	√	√
ENV5204	√	√	---	---	---	---	---	---	---	---
Reliability										
Warranty	5 years (see www.moxa.com/warranty)									

Universal PCI Serial Boards

	CP-104JU CP-104JU-T	CP-134U CP-134U-T	CP-134U-I CP-134U-I-T	CP-112UL CP-112UL-T	CP-112UL-I CP-112UL-I-T	CP-102U CP-102U-T	CP-102UL CP-102UL-T	CP-132UL CP-132UL-T	CP-132UL-I CP-132UL-I-T	POS-104UL POS-104UL-T
Hardware										
Comm. Controller	MU860									
Bus	32-bit Universal PCI									
Connector	RJ45 x 4	DB44 female		DB25 female		DB9 male x 2	DB25 female			DB44 female
Serial Interface										
RS-232 Ports	4	---	---	---	---	2	2	---	---	4
RS-422 Ports	---	---	---	---	---	---	---	---	---	---
RS-422/485 Ports	---	4	4	---	---	---	---	2	2	---
RS-232/422/485 Ports	---	---	---	2	2	---	---	---	---	---
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark									
Flow Control	RTS/CTS, XON/XOFF									
Baudrate	50 bps to 921.6 Kbps									
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Optical Isolation	---	---	2 KV	---	2 KV	---	---	---	2 KV	---
Driver Support										
Windows 9X/ME/NT	√	√	√	---	---	√	√	√	√	√
Windows 2000	√	√	√	√	√	√	√	√	√	√
Windows XP/2003/Vista x86/x64	√	√	√	√	√	√	√	√	√	√
Windows 2008 x86/x64	√	√	√	√	√	√	√	√	√	√
Windows CE 5.0	√	√	√	√	√	√	√	√	√	√
Windows CE 6.0	√	√	√	√	√	√	√	√	√	√
Windows XP Embedded	√	√	√	√	√	√	√	√	√	√
DOS	√	√	√	---	---	√	√	√	√	√
Linux 2.4/2.6	√	√	√	√	√	√	√	√	√	√
FreeBSD 4/5	√	√	√	---	---	√	√	√	√	√
QNX 4	---	---	---	---	---	---	---	---	---	---
QNX 6	√	√	√	---	---	√	√	√	√	√
SCO Open Server 5/6	√	√	√	√	√	√	√	√	√	√
UnixWare 7	√	√	√	√	√	√	√	√	√	√
Environmental Factors										
Dimensions (mm)	83 x 120	82.5 x 120	115 x 120	---	---	120 x 120	64.5 x 120	64.5 x 120	64.5 x 120	64.4 x 120
Operating Temperature	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C	0 to 55°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C
Regulatory Approvals										
FCC, Part 15 Class	B	B	B	B	B	B	B	B	B	B
EN55022 Class B	---	---	---	---	---	---	---	---	---	---
EN55022	√	√	√	√	√	√	√	√	√	√
EN55024	√	√	√	√	√	√	√	√	√	---
EN61000-3-2	√	√	√	√	√	√	√	√	√	√
EN61000-3-3	√	√	√	√	√	√	√	√	√	√
EN61000-6-2	---	---	---	---	---	---	---	---	---	√
EN61000-6-4	---	---	---	---	---	---	---	---	---	√
IEC 61000-4-2	√	√	√	√	√	√	√	√	√	√
IEC 61000-4-3	√	√	√	√	√	√	√	√	√	√
IEC 61000-4-4	√	√	√	√	√	√	√	√	√	√
IEC 61000-4-5	√	√	√	√	√	√	√	√	√	√
IEC 61000-4-6	√	√	√	√	√	√	√	√	√	√
IEC 61000-4-8	√	√	√	√	√	√	√	√	√	√
IEC 61000-4-11	---		---	---	---	---	---	---	---	---
IEC 61000-4-11 (DIPS)	√	√	√	√	√	√	√	√	√	√
ENV5204	---	---	---	---	---	---	---	---	---	---
Reliability										
Warranty	5 years (see www.moxa.com/warranty)									

Fiber Optic Serial Boards

	CP-102UF-M-ST	CP-102UF-M-ST-T	CP-102UF-S-ST	CP-102UF-S-ST-T
Hardware				
Bus	32-bit Universal PCI			
Optical Fiber Interface				
Mode	Multi-mode		Single-mode	
Fiber Connectors	ST type			
Cable Requirements	50/125, 62.5/125, or 100/140 µm		8.3/125, 8.75/125, 9/125 or 10/140 µm	
Transmission Distance	Max. 5 km		Max. 40 km	
Wavelength	820 nm		1310 nm	
Tx Output	-5 dBm			
Rx Sensitivity	-20 dBm		-24 dBm	
Point-to-Point Transmission	Half or full duplex			
Ring Transmission	Half duplex			
Serial Interface				
Number of Ports	2	2	2	2
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark			
Flow Control	XON/XOFF			
Baudrate	50 bps to 921.6 Kbps			
Driver Support				
Windows 9X/ME/NT	---	---	---	---
Windows 2000	√	√	√	√
Windows XP/2003/Vista x86/x64	√	√	√	√
Windows 2008 x86/x64	√	√	√	√
Windows CE 5.0	√	√	√	√
Windows CE 6.0	√	√	√	√
Windows XP Embedded	√	√	√	√
DOS	√	√	√	√
Linux 2.4/2.6	√	√	√	√
FreeBSD 4/5	---	---	---	---
QNX 4	---	---	---	---
QNX 6	√	√	√	√
SCO Open Server 5/6	√	√	√	√
UnixWare 7	√	√	√	√
Environmental Factors				
Dimensions (mm)	64.4 x 120	64.4 x 120	64.4 x 120	64.4 x 120
Operating Temperature	0 to 55°C	-40 to 85°C	0 to 55°C	-40 to 85°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C
Regulatory Approvals				
FCC, Part 15 Class	B	B	B	B
EN55022 Class B	√	√	√	√
EN55022	---	---	---	---
EN55024	√	√	√	√
EN61000-3-2	√	√	√	√
EN61000-3-3	√	√	√	√
EN61000-6-2	---	---	---	---
EN61000-6-4	---	---	---	---
IEC 61000-4-2	√	√	√	√
IEC 61000-4-3	√	√	√	√
IEC 61000-4-4	√	√	√	√
IEC 61000-4-5	√	√	√	√
IEC 61000-4-6	√	√	√	√
IEC 61000-4-8	√	√	√	√
IEC 61000-4-11	---	---	---	---
IEC 61000-4-11 (DIPS)	√	√	√	√
ENV5204	---	---	---	---
Reliability				
Warranty	5 years (see www.moxa.com/warranty)			

ISA Serial Boards

	C320Turbo	C218Turbo	C168H	C168HS	C104H	C104HS
Hardware						
Comm. Controller	16C550C or compatible					
Bus	16-bit ISA					
Connector	DB25 female	DB62 female			DB37 female	
Serial Interface						
RS-232 Ports	32	8	8	8	4	4
RS-422 Ports	---	---	---	---	---	---
RS-422/485 Ports	---	---	---	---	---	---
RS-232/422/485 Ports	---	---	---	---	---	---
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control	---	---	---	---	---	---
Baudrate	50 bps to 460.8 Kbps	50 bps to 921.6 Kbps				
ESD Protection	---	Optional	---	25 KV	---	25 KV
Optical Isolation	---	Optional	Optional	Optional	---	---
Driver Support						
Windows 9X/ME/NT	√	√	√	√	√	√
Windows 2000	√	√	√	√	√	√
Windows XP/2003/Vista x86/x64	√	√	√	√	√	√
Windows 2008 x86/x64	√	√	√	√	√	√
Windows CE 5.0	---	---	---	---	---	---
Windows CE 6.0	---	---	---	---	---	---
Windows XP Embedded	---	---	√	√	√	√
DOS	√	√	√	√	√	√
Linux 2.4/2.6	√	√	√	√	√	√
FreeBSD 4/5	---	---	√	√	√	√
QNX 4	√	√	√	√	√	√
QNX 6	√	√	√	√	√	√
SCO Open Server 5/6	√	√	√	√	√	√
UnixWare 7	√	√	√	√	√	√
Environmental Factors						
Dimensions (mm)	107 x 158	105 x 180	93 x 157	93 x 157	83 x 157	83 x 157
Operating Temperature	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C
Regulatory Approvals						
FCC, Part 15 Class	A	A	A	A	A	A
EN55022 Class B	---	---	---	---	---	---
EN55022	---	---	√	√	√	√
EN55024	---	---	---	---	---	---
EN61000-3-2	---	---	---	---	---	---
EN61000-3-3	---	---	---	---	---	---
EN61000-6-2	---	---	---	---	---	---
EN61000-6-4	---	---	---	---	---	---
IEC 61000-4-2	√	√	√	√	√	√
IEC 61000-4-3	√	√	√	√	√	√
IEC 61000-4-4	√	√	√	√	√	√
IEC 61000-4-5	---	√	---	---	---	---
IEC 61000-4-6	---	√	---	---	---	---
IEC 61000-4-8	---	---	---	---	---	---
IEC 61000-4-11	---	---	---	---	---	---
IEC 61000-4-11 (DIPS)	---	√	---	---	---	---
ENV5204	√	√	√	√	√	√
Reliability						
Warranty	5 years (see www.moxa.com/warranty)					

ISA Serial Boards

	CI-134	CI-134I	CI-134IS	CI-132	CI-132I	CI-132IS
Hardware						
Comm. Controller	16C550C or compatible					
Bus	16-bit ISA					
Connector	DB37 female			DB9 male x 2		
Serial Interface						
RS-232 Ports	---	---	---	---	---	---
RS-422 Ports	---	---	---	---	---	---
RS-422/485 Ports	4	4	4	2	2	2
RS-232/422/485 Ports	---	---	---	---	---	---
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control	---	---	---	---	---	---
Baudrate	50 bps to 921.6 Kbps					
ESD Protection	---	---	25 KV	---	---	25 KV
Optical Isolation	---	2 KV	2 KV	---	2 KV	2 KV
Driver Support						
Windows 9X/ME/NT	√	√	√	√	√	√
Windows 2000	√	√	√	√	√	√
Windows XP/2003/Vista x86/x64	√	√	√	√	√	√
Windows 2008 x86/x64	√	√	√	√	√	√
Windows CE 5.0	---	---	---	---	---	---
Windows CE 6.0	---	---	---	---	---	---
Windows XP Embedded	√	√	√	√	√	√
DOS	√	√	√	√	√	√
Linux 2.4/2.6	√	√	√	√	√	√
FreeBSD 4/5	√	√	√	√	√	√
QNX 4	√	√	√	√	√	√
QNX 6	√	√	√	√	√	√
SCO Open Server 5/6	√	√	√	√	√	√
UnixWare 7	√	√	√	√	√	√
Environmental Factors						
Dimensions (mm)	85 x 160	110 x 180	110 x 180	75 x 157	105 x 157	105 x 157
Operating Temperature	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C	-20 to 85°C
Regulatory Approvals						
FCC, Part 15 Class	B	B	B	---	---	---
EN55022 Class B	---	---	---	---	---	---
EN55022	√	√	√	√	√	√
EN55024	---	---	---	---	---	---
EN61000-3-2	---	---	---	---	---	---
EN61000-3-3	---	---	---	---	---	---
EN61000-6-2	---	---	---	---	---	---
EN61000-6-4	---	---	---	---	---	---
IEC 61000-4-2	√	√	√	√	√	√
IEC 61000-4-3	√	√	√	√	√	√
IEC 61000-4-4	√	√	√	√	√	√
IEC 61000-4-5	---	---	---	---	---	---
IEC 61000-4-6	---	---	---	---	---	---
IEC 61000-4-8	---	---	---	---	---	---
IEC 61000-4-11	---	---	---	---	---	---
IEC 61000-4-11 (DIPS)	---	---	---	---	---	---
ENV5204	√	√	√	√	√	√
Reliability						
Warranty	5 years (see www.moxa.com/warranty)					

PC/104 Modules

	CA-108 CA-108-T	CA-114 CA-114-T	CA-134I CA-134I-T	CA-104 CA-104-T	CA-132 CA-132-T	CA-132I CA-132I-T
Hardware						
Comm. Controller	16C550C or compatible					
Bus	PC/104 bus					
Box Header Connector	40-pin	40-pin	40-pin	40-pin	20-pin	20-pin
Serial Interface						
RS-232 Ports	8	---	---	4	---	---
RS-422 Ports	---	---	---	---	---	---
RS-422/485 Ports	---	---	4	---	2	2
RS-232/422/485 Ports	---	4	---	---	---	---
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control	---	---	---	---	---	---
Baudrate	50 bps to 921.6 Kbps					
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Optical Isolation	---	---	2 KV	---	---	2 KV
Driver Support						
Windows 9X/ME/NT	√	√	√	√	√	√
Windows 2000	√	√	√	√	√	√
Windows XP/2003/Vista x86/x64	√	√	√	√	√	√
Windows 2008 x86/x64	---	---	---	---	---	---
Windows CE 5.0	√	√	√	√	√	√
Windows CE 6.0	√	√	√	√	√	√
Windows XP Embedded	√	√	√	√	√	√
DOS	√	√	√	√	√	√
Linux 2.4/2.6	√	√	√	√	√	√
FreeBSD 4/5	---	---	---	---	---	---
QNX 4	√	√	√	√	√	√
QNX 6	√	√	√	√	√	√
SCO Open Server 5/6	---	---	---	---	---	---
UnixWare 7	---	---	---	---	---	---
Environmental Factors						
Dimensions (mm)	90 x 96	90 x 96	90 x 96	90 x 96	90 x 96	90 x 96
Operating Temperature	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-40 to 55°C	-40 to 55°C	-40 to 55°C	-40 to 55°C	-40 to 55°C	-40 to 55°C
Regulatory Approvals						
FCC, Part 15 Class	A	A	A	A	A	A
EN55022 Class B	---	---	---	---	---	---
EN55022	√	√	√	√	√	√
EN55024	√	√	√	√	√	√
EN61000-3-2	√	√	√	√	√	√
EN61000-3-3	√	√	√	√	√	√
EN61000-6-2	√	√	√	√	√	√
EN61000-6-4	√	√	√	√	√	√
IEC 61000-4-2	√	√	√	√	√	√
IEC 61000-4-3	√	√	√	√	√	√
IEC 61000-4-4	√	√	√	√	√	√
IEC 61000-4-5	√	√	√	√	√	√
IEC 61000-4-6	√	√	√	√	√	√
IEC 61000-4-8	√	√	√	√	√	√
IEC 61000-4-11	---	---	---	---	---	---
IEC 61000-4-11 (DIPS)	√	√	√	√	√	√
ENV5204	---	---	---	---	---	---
Reliability						
Warranty	5 years (see www.moxa.com/warranty)					

PC/104-Plus Modules

	CB-108 CB-108-T	CB-114 CB-114-T	CB-134I CB-134I-T
Hardware			
Comm. Controller	MU860 (16C550C compatible)		
Bus	PC/104-Plus bus		
Box Header Connector	40-pin	40-pin	40-pin
Serial Interface			
RS-232 Ports	8	---	---
RS-422 Ports	---	---	---
RS-422/485 Ports	---	---	4
RS-232/422/485 Ports	---	4	---
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark		
Flow Control	---	---	---
Baudrate	50 bps to 921.6 Kbps		
ESD Protection	15 KV	15 KV	15 KV
Optical Isolation	---	---	2 KV
Driver Support			
Windows 9X/ME/NT	---	---	---
Windows 2000	√	√	√
Windows XP/2003/Vista x86/x64	√	√	√
Windows 2008 x86/x64	√	√	√
Windows CE 5.0	√	√	√
Windows CE 6.0	√	√	√
Windows XP Embedded	√	√	√
DOS	√	√	√
Linux 2.4/2.6	√	√	√
FreeBSD 4/5	---	---	---
QNX 4	---	---	---
QNX 6	√	√	√
SCO Open Server 5/6	---	---	---
UnixWare 7	---	---	---
Environmental Factors			
Dimensions (mm)	90 x 96	90 x 96	90 x 96
Operating Temperature	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C	0 to 55°C, or -40 to 85°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-40 to 55°C	-40 to 55°C	-40 to 55°C
Regulatory Approvals			
FCC, Part 15 Class	A	A	A
EN55022 Class B	---	---	---
EN55022	√	√	√
EN55024	√	√	√
EN61000-3-2	√	√	√
EN61000-3-3	√	√	√
EN61000-6-2	√	√	√
EN61000-6-4	√	√	√
IEC 61000-4-2	√	√	√
IEC 61000-4-3	√	√	√
IEC 61000-4-4	√	√	√
IEC 61000-4-5	√	√	√
IEC 61000-4-6	√	√	√
IEC 61000-4-8	√	√	√
IEC 61000-4-11	---	---	---
IEC 61000-4-11 (DIPS)	√	√	√
ENV5204	---	---	---
Reliability			
Warranty	5 years (see www.moxa.com/warranty)		

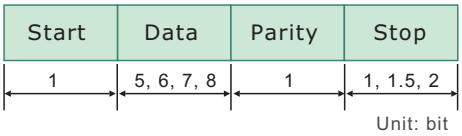
The Basics of RS-232/422/485

RS-232—the most common and easy-to-use communication interface

The RS-232 serial interface was developed for connecting a computer to common peripherals such as modems, overhead projectors, and the sensors and actuators used for industrial automation applications. Despite its limited 15 m transmission distance, RS-232 is low cost and easy-to-wire, making it the first choice for many applications. RS-232 establishes full-duplex (2-way) communication, with signals represented by voltage levels measured with respect to a system common ground (power or logic ground). The "idle" state (MARK) is negative with respect to the common ground, and the "active" state (SPACE) is positive with respect to the common ground.

RS-232 Data Format

Start bit: 1 bit
Data bits: 5, 6, 7, or 8 bits
Parity: None, Odd, Even, Space, Mark
Stop bits: 1, 1.5 (if data bits = 5), or 2 bits



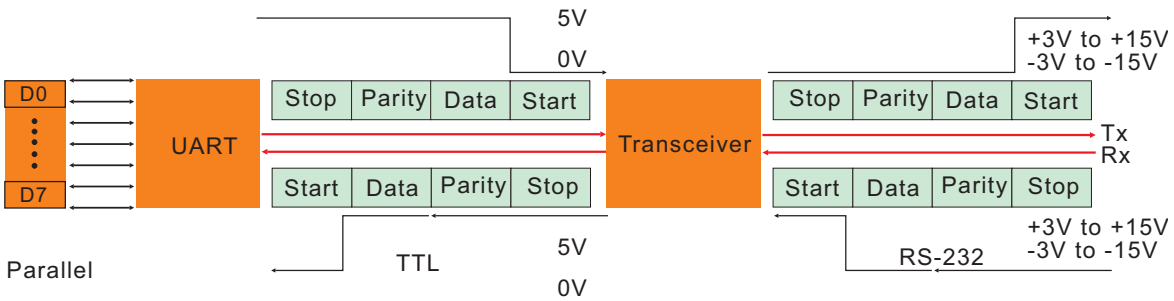
RS-232 Specs

Standard	Connection Type	Operation Mode	Drivers per Line	Receivers per Line	Max. Cable Length	Max. Data Rate
EIA RS-232	Point-to-point	Single-ended	1	1	50 ft (15 m)	921.6 Kbps

RS-232 Signal Definition

The general relationship between the UART, TTL signal, transceiver, and RS-232 signal is illustrated in the following figure. UART is short for "universal asynchronous receiver transmitter," and TTL stands for "transistor to transistor logic." The UART, which is located on the serial board and stands between the computer's CPU and the transceiver, transmits signals at 0 and 5 volts. The RS-232 transceiver converts the signal voltage to +3V to +15V, and -3V to -15V.

TxD	Transmit Data
RxD	Receive Data
RTS	Request to Send
CTS	Clear to Send
DTR	Data Terminal Ready
DSR	Data Set Ready
DCD	Data Carrier Detect
GND	Ground

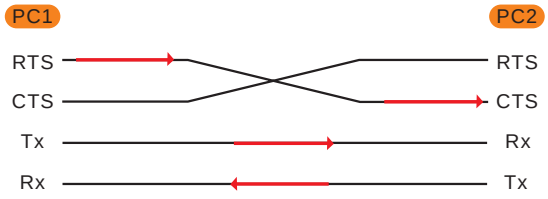


Flow Control

In RS-232 communications, one side of the connection sends a "flow control" signal to tell the other side to stop or start transmitting. Flow control signals are sent when the sender needs to take a break, such as when a data buffer is full.

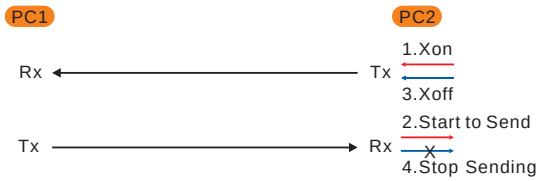
H/W Flow Control

Hardware flow control uses RS-232's RTS and CTS signals to indicate when data transmission should be paused or re-started. For example, as indicated in the figure, when PC1 is ready to receive, it raises the RTS signal to request data from PC2.



S/W Flow Control

Software flow control works by sending an XON/XOFF signal through the data channels. For example, as indicated in the following figure, PC2 sends an XON pattern when it is ready to receive, and then when its Rx buffer is almost full, it sends an XOFF pattern to request that PC1 stop transmitting.



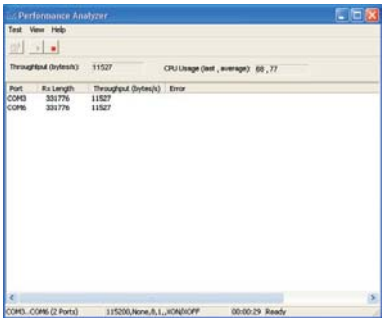
Use Moxa PComm Library to Make Serial Programming Easy

Moxa PComm Lite provides software developers with a complete library of intuitive function calls for developing serial comm applications under Windows NT, 95, 98, 2000, ME, XP, and 2003. PComm Lite requires fewer lines of code than Microsoft's more complex Win32 COMM API, allowing programmers to save time and reduce the number of bugs in their applications.

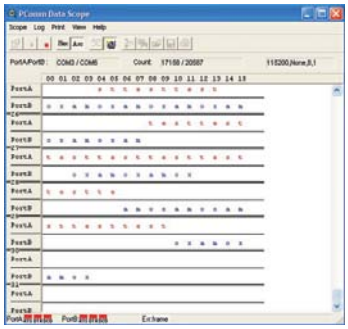
Features of Moxa PComm Library

- 50 easy-to-use API functions
- Superior troubleshooting utilities
- Supports multiple interfaces: VB, C/C++, Delphi
- Supports X/Y/ZModem, Kermit, and ASCII protocols
- Compatible with Win32 Comm API

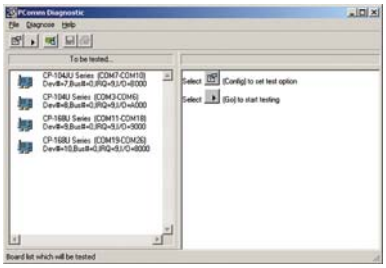
Performance Analyzer



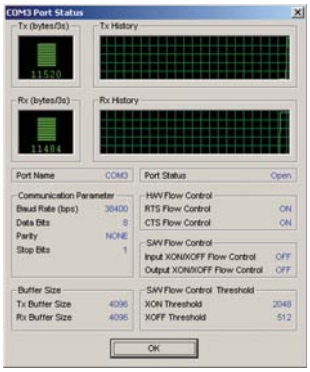
Data Scope

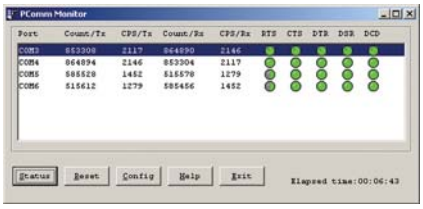


PComm Diagnostic



PComm Monitor





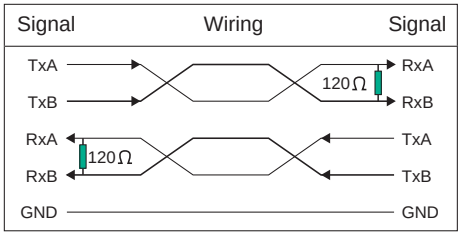
RS-422/485—tailor-made for industrial applications

Many of the devices used in today's industrial environments are designed for the RS-422 and RS-485 interfaces, both of which use "differential transmission" to "subtract out" external electronic and electromagnetic disturbances. For this reason, RS-422/485 can be used to transmit data up to 1.2 km. In addition to the need for long distance and multi-drop transmission, many industrial applications also require isolation, proper housing, heavy-duty wiring, a reliable power supply, and over-surge protection.

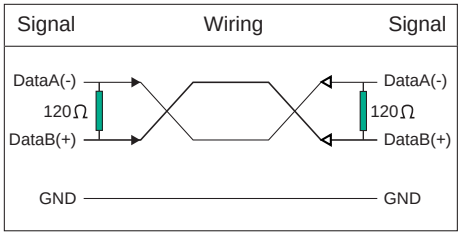
Differential Transmission

The RS-422 and RS-485 protocols use differential transmission to achieve high speed data transmission (up to 10 Mbps) over distances up to 4,000 feet (1.22 km). Differential transmission works by splitting each signal into two separate wires with opposite voltage states. The signals are subtracted at the receiving end, making this type of wiring configuration well-suited for noisy environments.

RS-422 Wiring



RS-485 Wiring



RS-422 vs. RS-485

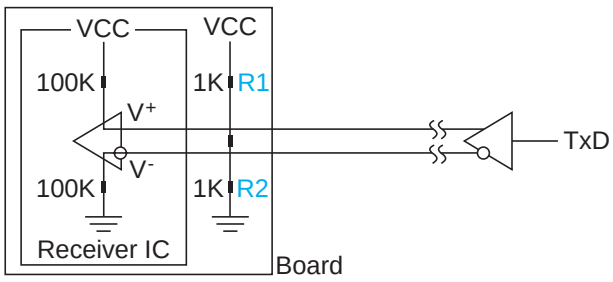
Standard	Connection Type	Operation Mode	Drivers per Line	Receivers per Line	Max. Cable Length	Max. Data Rate
EIA RS-422	Full-duplex, Point-to-point	Differential	1	10	4000 ft (1.22 km)	10 Mbps
EIA RS-485	Half-duplex, Multi-drop	Differential	32	31	4000 ft (1.22 km)	10 Mbps

Multi-drop Networks

RS-485 was designed for applications that require connecting multiple devices to a single data line. An RS-485 multi-drop network uses a balanced transmission system that can accept up to 32 devices on the same data line. This is achieved with tri-state drivers that are controlled by a programmable handshake line to ensure that only one device acts as a driver at any given time.

Termination

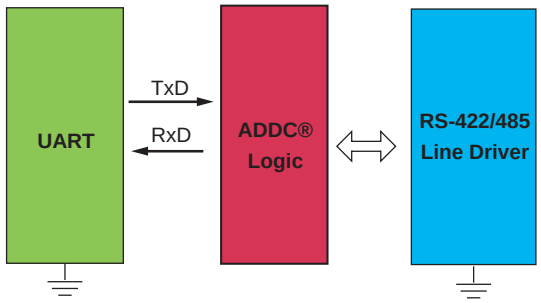
In order to prevent signal reflection, termination resistors are used to match the impedance of the receive and transmit nodes. The resistance needed to match the characteristic impedance is specified by the cable manufacturer. The most common value is 120 ohms.



ADDC® (Automatic Data Direction Control)

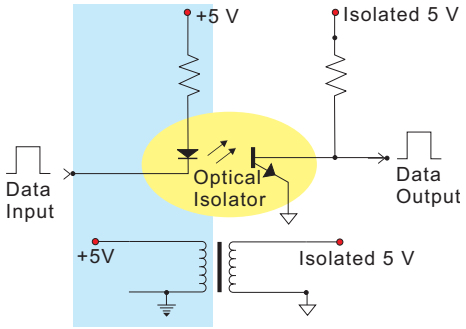
RS-485 uses differential data transmission over two wires to transmit data from one station to another, and allows multiple transmitters and receivers to be used on the same data line. RS-485 uses half-duplex transmission, which means that transmission and reception share the same data channels. For this reason, only one transmitter can be active at any given time.

Moxa's serial boards have a built-in circuitry to switch transmitters on and off automatically. We call this form of switching ADDC® (automatic data direction control). ADDC® is much easier to implement than the traditional "handshaking" method that uses the RTS signal.



Isolation Eliminates Ground Loops!

A common problem in many industrial applications is the disturbance caused by ground loop currents that flow through the ground line when ground voltages differ between connected devices. To overcome this problem, Moxa's industrial boards and full function converters use "optical isolation" to protect the boards against as much as 2000 volts.



Industrial Wiring Peripherals

Moxa provides an assortment of wiring peripherals that can be used to transform DB9 and DB25 connectors into terminal block connectors. The wiring peripherals shown below are DIN-Rail mountable.

TB-F9

TB-M9

TB-F25

TB-M25

RS-422/485 Board Checklist

Be sure to answer the following questions before ordering your RS-422/485 board from Moxa:

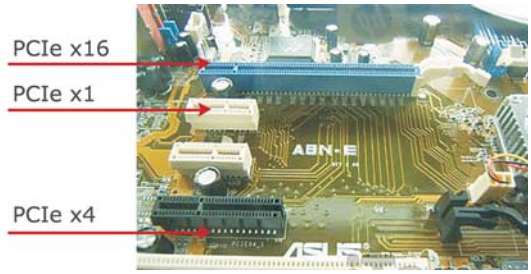
1. Does your system use RS-422, 2-wire RS-485, or 4-wire RS-485?
2. Does your application require "isolation protection" and/or "surge protection?"
3. What is the resistance of the termination resistors used by your application?
4. Is it easy to modify your application's resistor setup?
5. What range of baudrates does your application support?

Driver Support List

	Operating System																	
	DOS	Windows 3.x	Windows 9X	Windows NT	Windows 2000/XP/2003	Windows Vista/2008	Windows XP Embedded	Windows XP/2003/Vista/2008 x64	Windows CE 5.0	Windoows CE 6.0	Linux 2.4/2.6	SCO OpenServer 5	SCO OpenServer 6	UnixWare 7	FreeBSD 4	FreeBSD 5	QNX4	QNX6
C320Turbo/PCI	√	-	√	√	√	√	-	√	-	-	√	√	√	√	-	-	√	√
C320Turbo	√	√	√	√	√	√	-	√	-	-	√	√	√	√	-	-	√	√
C218Turbo/PCI	√	-	√	√	√	√	-	√	-	-	√	√	√	√	-	-	√	√
C218Turbo	√	√	√	√	√	√	-	√	-	-	√	√	√	√	-	-	√	√
CP-118EL	√	-	-	-	√	√	√	√	√	-	√	√	√	√	√	√	-	√
CP-168EL	√	-	-	-	√	√	√	√	√	-	√	√	√	√	√	√	-	√
CP-114EL	-	-	-	-	√	√	√	√	-	-	√	√	√	√	-	-	-	√
CP-114EL-I	-	-	-	-	√	√	√	√	-	-	√	√	√	√	-	-	-	√
CP-104EL	√	-	-	-	√	√	√	√	√	-	√	√	√	√	√	√	-	√
CP-102E	-	-	-	-	√	√	√	√	-	-	√	√	√	√	-	-	-	√
CP-102EL	-	-	-	-	√	√	√	√	-	-	√	√	√	√	-	-	-	√
CP-132EL	-	-	-	-	√	√	√	√	-	-	√	√	√	√	-	-	-	√
CP-132EL-I	-	-	-	-	√	√	√	√	-	-	√	√	√	√	-	-	-	√
CP-118U	√	-	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√
CP-138U	√	-	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√
CP-118U-I	√	-	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√
CP-138U-I	√	-	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√
CP-168U	√	-	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√
CP-114UL	√	-	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√
CP-114UL-I	-	-	-	-	√	√	√	√	√	√	√	√	√	√	-	-	-	-
CP-104UL	√	-	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√
CP-104JU	√	-	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√
POS-104UL	√	-	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√
CP-134U	√	-	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√
CP-134U-I	√	-	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√
CP-112UL	-	-	-	-	√	√	√	√	√	√	√	√	√	√	-	-	-	√
CP-112UL-I	-	-	-	-	√	√	√	√	√	√	√	√	√	√	-	-	-	√
CP-132UL	√	-	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√
CP-132UL-I	√	-	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√
CP-102U	√	-	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√
CP-102UL	√	-	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√
CP-102UF	√	-	-	-	√	√	√	√	√	√	√	√	√	√	-	-	-	√
C168H Series	√	-	√	√	√	√	√	√	-	-	√	√	√	√	√	√	√	√
C104H Series	√	√	√	√	√	√	√	√	-	-	√	√	√	√	√	√	√	√
CI-134 Series	√	√	√	√	√	√	√	√	-	-	√	√	√	√	√	√	√	√
CI-132 Series	√	-	√	√	√	√	√	√	-	-	√	√	√	√	√	√	√	√
CA-108	√	-	√	√	√	√	√	√	√	√	√	-	-	-	-	-	√	√
CA-114	√	-	√	√	√	√	√	√	√	√	√	-	-	-	-	-	√	√
CA-134I	√	-	√	√	√	√	√	√	√	√	√	-	-	-	-	-	√	√
CA-104	√	-	√	√	√	√	√	√	√	√	√	-	-	-	-	-	√	√
CA-132/132I	√	-	√	√	√	√	√	√	√	√	√	-	-	-	-	-	√	√
CB-108	√	-	√	√	√	√	√	√	√	√	√	-	-	-	-	-	√	√
CB-114	√	-	√	√	√	√	√	√	√	√	√	-	-	-	-	-	√	√
CB-134I	√	-	√	√	√	√	√	√	√	√	√	-	-	-	-	-	√	√

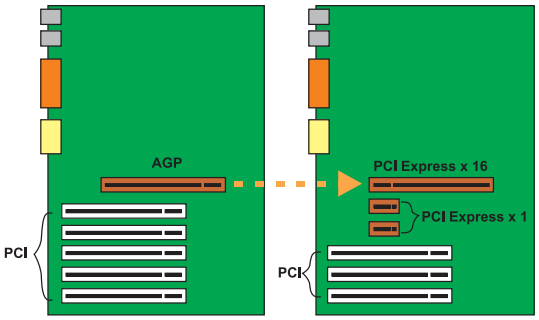
Introduction to PCI Express

The PCI Express serial interface is capable of transmitting data at the rate of 2.5 Gbps. This extremely high rate of data transmission is achieved by transmitting data bit-by-bit over "lanes" that consist of 2 pairs of wires (2 wires for transmitting and 2 wires for receiving). A single connection can achieve a burst mode transmission speed of 320 Mbps.



PCI Express to replace PCI, PCI-X, and AGP

The older PCI specification is based on a multi-drop parallel bus design. PCI Express, which will eventually replace PCI, PCI-X, and AGP, is a brand new I/O technology defined by the PCI-SIG. The PCI-SIG's stated goal is to create a unified standard that can handle a wide range of tasks.



Moxa's PCI Express Boards Fit Any PCI Express Slot

Multiple lanes are combined to create a PCI Express link, with the number of lanes used to label the connection by writing x1, x2, x4, x12, x16, or x32. Note that each lane uses 4 wires (e.g., a PCI Express x1 board uses 4 wires, and a PCI Express x16 board uses 64 wires). It should come as no surprise then that different sized connections use different sized slots. However, the beauty of the PCI Express design is that a PCI Express board can be installed in larger slots. This means that you can install Moxa's PCI Express x1 boards in any PCI Express slot.

Main Point: PCI Express x1 boards can be installed in x1, x2, x4, x12, x16, and x32 slots

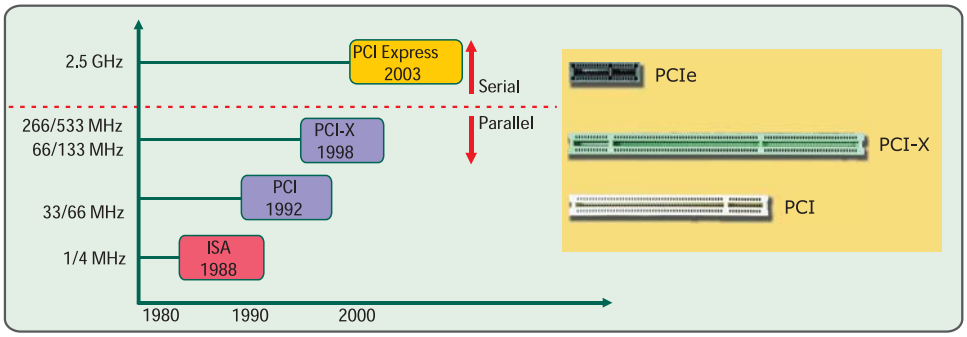
The difference between PCI and PCI Express

PCI Express is a serial interface that allows point-to-point connections between devices. This differs from the older PCI bus specification that uses a shared, parallel bus architecture.

Bus Trend

ISA → PCI → PCI-X → PCI Express (PCIe)

Bus Transmission Speeds

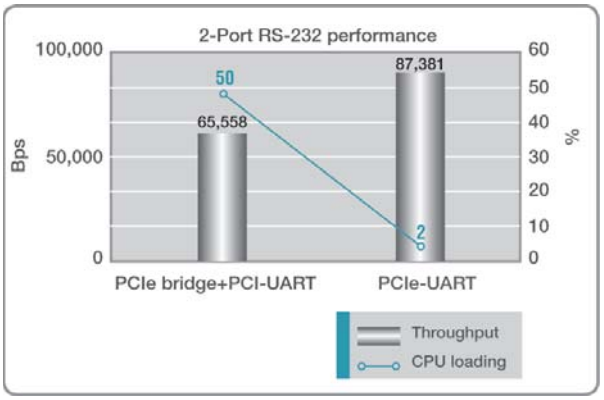


Another World First: Moxa Launches the "One-chip" PCI Express Board

For more than 20 years, Moxa has dedicated a large percentage of its R&D effort to the design of multiport serial boards, and this effort has paid off once again to the benefit of end-users around the world. Moxa's new "one-chip" PCI Express boards stand high above the crowd compared with other PCI Express boards on the market today. In fact, Moxa is the first manufacturer in the world to use an advanced one-chip PCIe-UART chip, which combines the PCIe bridge and UART on the same chip. The one-chip PCIe boards are designed for a longer MTBF and greater performance, and provide users with baudrates up to 921.6 Kbps and 15 KV ESD protection for greater reliability. Moreover, instead of requiring users to open up the computer to set DIP switches and jumpers manually, one-chip PCIe provides a convenient software solution for configuring the serial interface and termination resistors, giving users the benefit of easy maintenance.

One-chip Solution Optimizes CPU Performance

One-chip PCIe features a 33% higher throughput and decreases CPU loading by 48%, outperforming traditional boards that use separate chips for the PCIe bridge and UART.



DIP Switch-less and Jumper-less Design

With this PCIe-UART, you can configure the serial interface and termination resistor by software instead of using a DIP switch and jumper. The absence of a DIP switch and jumper also makes these one-chip PCIe boards more user-friendly and easier to maintain, since there is no need to open up the computer to adjust the settings manually. Furthermore, the one-chip design reduces manufacturing time and costs since fewer components are required.

Onboard LEDs for Easy Maintenance

Moxa's multiport serial boards have onboard LEDs to clearly indicate data transmit/receive status. This is very helpful for users, especially since troubleshooting can be done without opening up the computer.

Drivers Galore

Moxa's PCI Express boards support a wide range of drivers for desktop solutions (Windows 2000, XP/Vista x86/x64) and server solutions (Windows 2003/2008, with certification). Moreover, we also provide drivers for Linux, SCO Open Server 5/6, QNX 6, Windows XP Embedded, and UnixWare 7.

CASE STUDY

Ticket Vending Machine

Cost-effective COM port expansion

Ticket Vending Machines (TVM) have become a common installation in mass rapid transit systems around the world to provide passengers with a faster and more convenient way to purchase tickets. TVMs closely resemble Automated Teller Machines (ATM) as both use an embedded computer to control the user interface and transaction devices. Although they do not perform banking transactions, TVMs allow passengers to purchase tickets and add money to stored-value cards by cash, coins, credit/bank, and even Smart Cards.

Each of these transaction methods and TVM functions, such as printing tickets and receipts, requires a designated peripheral device that is connected to the embedded computer for processing. In order to accommodate all these peripheral devices in a single machine, TVMs are beginning to use smaller PCs that come with fewer expansion slots. The CP-114EL multiport serial board can connect up to 4 RS-232/422/485 peripheral devices via a single PCI Express expansion slot, offering a cost-effective and space-saving solution for mass transit agencies to provide passengers with more services and greater convenience.

Application Requirements

- COM port connections for multiple peripheral devices
- High product reliability and quality
- Small form factor due to tight space constraints
- Good technical support and product service
- Excellent transmission speed and efficiency

Why Moxa?

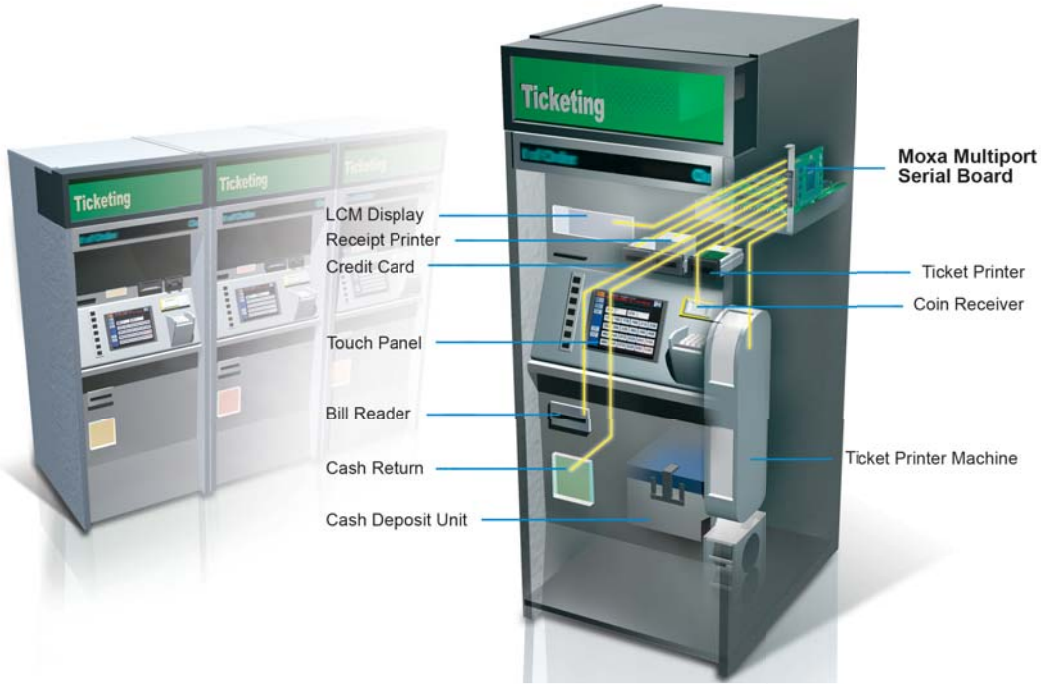
- Support for various operating systems to reduce the cost of future upgrades
- High MTBF and WHQL (Windows Hardware Qualification Laboratory) certified drivers
- Set RS-232, RS-422, RS-485 operation independently for each port
- Low profile model for small-sized computers
- On-board LED display for data transmission management
- All Moxa products are guaranteed to be of the highest quality and with a 5-year warranty
- Compatible with PCIe x1, x2, x4, x12, x16, and x32 connections
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control

Key Product

CP-114EL

4-port RS-232/422/485 low profile PCI Express board

Diagram



CP-118EL

8-port RS-232/422/485 PCI Express serial board

- PCI Express x1 compliant
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Choose from a wide range of connection cables and boxes
- Low profile form factor fits small-sized PCs
- Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64), Windows CE 5.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7
- 15 KV ESD protection on the board

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CP-118EL is a smart, 8-port PCI Express board designed for POS and ATM applications. It is a top choice of industrial automation engineers and system integrators, and supports many different operating systems, including Windows, Linux, and even Unix. In addition, each of the board's 8 serial ports can be configured independently for RS-232, RS-422, or RS-485 (either 2-wire or 4-wire), and the ports supports a super fast 921.6 Kbps baudrate. The CP-118EL provides full modem control signals to ensure compatibility with a wide range of serial peripherals, and its PCI Express "x1" classification allows it to be installed in any PCI Express slot.

Smaller Form Factor

The CP-118EL is a low profile board that is compatible with any PCI Express slot. The board requires only a 3.3 VDC power supply, which means that the board fits any host computer, ranging from shoebox to standard-sized PCs.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-118EL board is no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: PCI Express x1
Connector: VHDCI 68

Serial Interface

Number of Ports: 8
Serial Standards: RS-232/422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64), Windows CE 5.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7

Physical Characteristics

Dimensions: 67.21 x 132 mm (2.65 x 5.20 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B
EMS: EN55024, EN61000-3-2, EN61000-3-3, EN61000-6-2, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11

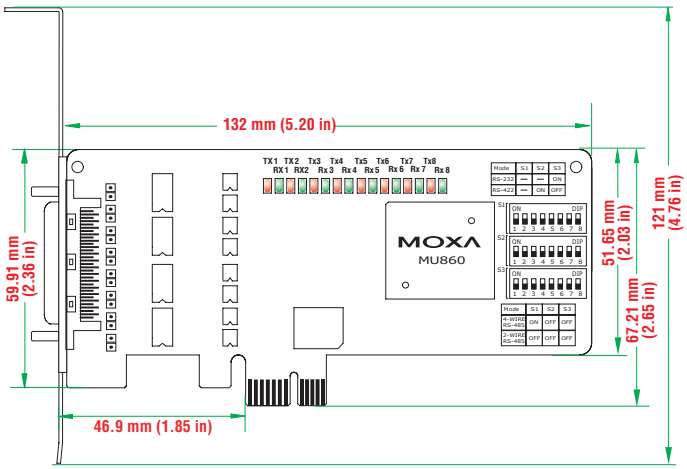
Power Requirements

Power Consumption: 860 mA @ 3.3 V

Warranty

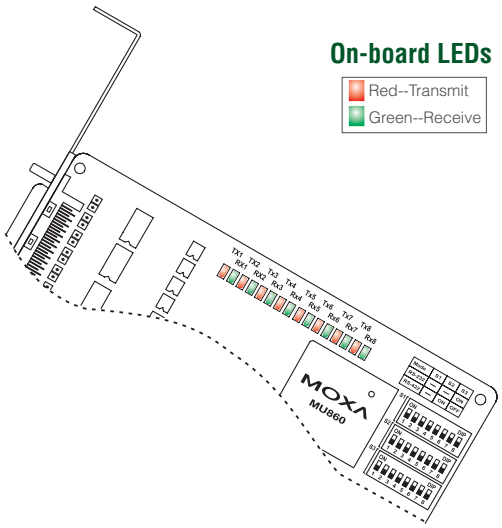
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions



On-board LEDs

Red--Transmit
Green--Receive



Ordering Information

Available Models

CP-118EL: 8-port RS-232/422/485 low profile PCI Express x1 serial board

Package Checklist

- CP-118EL board
- Standard bracket and low profile bracket
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

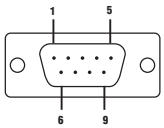
Connection Options (can be purchased separately)

OPT8-M9+
DB9 male x 8 (150 cm cable)

CBL-M68M9x8-100 (OPT8D+)
DB9 male x 8 (100 cm cable)

PIN	RS-232	RS-422/RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	---
2	RxD	TxD+(B)	---
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	---	---
7	RTS	---	---
8	CTS	---	---

DB9 male

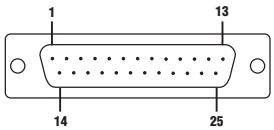


OPT8B+
DB25 male x 8 (150 cm cable)

CBL-M68M25x8-100 (OPT8C+)
DB25 male x 8, (100 cm cable)

PIN	RS-232	RS-422/RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	---
4	RTS	---	---
5	CTS	---	---
6	DSR	---	---
7	GND	GND	GND
8	DCD	TxD-(A)	---
20	DTR	RxD-(A)	Data-(A)

DB25 male

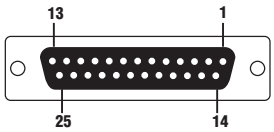


OPT8A+
DB25 female x 8 (150 cm cable)

OPT8S+
DB25 female x 8 (150 cm cable)
25 KV ESD Surge Protection

PIN	RS-232	RS-422/RS-485-4w	RS-485-2w
2	RxD	TxD+(B)	---
3	TxD	RxD+(B)	Data+(B)
4	CTS	---	---
5	RTS	---	---
6	DTR	RxD-(A)	Data-(A)
7	GND	GND	GND
8	DCD	TxD-(A)	---
20	DSR	---	---

DB25 female



CP-168EL

8-port RS-232 PCI Express serial board

- PCI Express x1 compliant
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Choose from a wide range of connection cables and boxes
- Low profile form factor fits small-sized PCs
- Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64), Windows CE 5.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64) FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7
- 15 KV ESD protection on the board

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CP-168EL is a smart, 8-port PCI Express board designed for POS and ATM applications. It is a top choice of industrial automation engineers and system integrators, and supports many different operating systems, including Windows, Linux, and even Unix. In addition, each of the board's 8 RS-232 serial ports supports a super fast 921.6 Kbps baudrate. The CP-168EL provides full modem control signals to ensure compatibility with a wide range of serial peripherals, and its PCI Express "x1" classification allows it to be installed in any PCI Express slot.

Smaller Form Factor

The CP-168EL is a low profile board that is compatible with any PCI Express slot. The board requires only a 3.3 VDC power supply, which means that the board fits any host computer, ranging from shoebox to standard-sized PCs.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-168EL board is no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: PCI Express x1
Connector: VHDCI 68

Serial Interface

Number of Ports: 8
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support

Operating Sytems: Windows (2000, XP/2003/Vista/2008 x86/x64), Windows CE 5.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7

Physical Characteristics

Dimensions: 67.21 x 102 mm (2.65 x 4.02 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B
EMS: EN55024, EN61000-3-2, EN61000-3-3, EN61000-6-2, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11

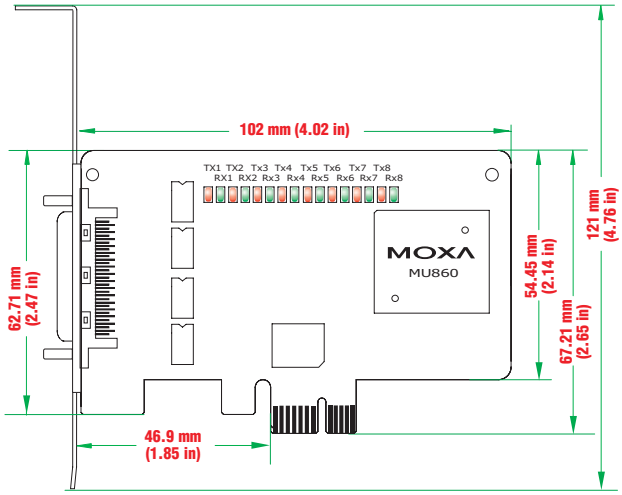
Power Requirements

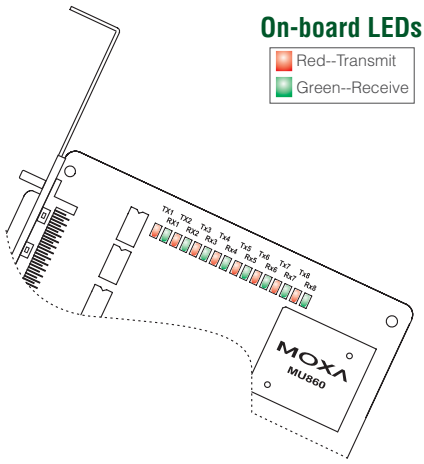
Power Consumption: 630 mA @ 3.3 V

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions





Ordering Information

Available Models

CP-168EL: 8-port RS-232 low profile PCI Express x1 serial board

Package Checklist

- CP-168EL board
- Standard bracket and low profile bracket
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Connection Options (can be purchased separately)

OPT8-M9+

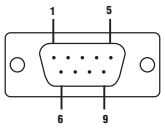
DB9 male x 8 (150 cm cable)

CBL-M68M9x8-100 (OPT8D+)

DB9 male x 8 (100 cm cable)

PIN	RS-232	PIN	RS-232
1	DCD	5	GND
2	RxD	6	DSR
3	TxD	7	RTS
4	DTR	8	CTS

DB9 male



OPT8B+

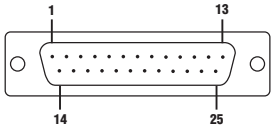
DB25 male x 8 (150 cm cable)

CBL-M68M25x8-100 (OPT8C+)

DB25 male x 8 (100 cm cable)

PIN	RS-232	PIN	RS-232
2	TxD	6	DSR
3	RxD	7	GND
4	RTS	8	DCD
5	CTS	20	DTR

DB25 male



OPT8A+

DB25 female x 8, 150 cm Cable

OPT8S+

DB25 female x 8 (150 cm cable)
25 KV ESD protection

PIN	RS-232	PIN	RS-232
2	RxD	6	DTR
3	TxD	7	GND
4	CTS	8	DCD
5	RTS	20	DSR

OPT8F+/Z+ (RS-422)

DB25 female x 8 (150 cm cable)
110 or 230 VAC power adaptor
(115.2 Kbps max. baudrate)

OPT8F+ with 500 V isolation

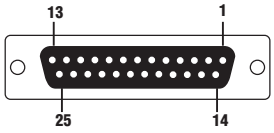
OPT8K+ (RS-422/485)

DB25 female x 8 (150 cm cable)
110 or 230 VAC power adaptor

OPT8K+ with 2 KV isolation

PIN	RS-422/RS-485-4w	RS-485-2w
2	RxD+(B)	Data+(B)
3	TxD+(B)	
7	GND	GND
14	RxD-(A)	Data-(A)
16	TxD-(A)	

DB25 female

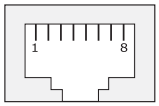


OPT8-RJ45+

8-pin RJ45 (30 cm cable)

PIN	RS-232	PIN	RS-232
1	DSR	5	RxD
2	RTS	6	DCD
3	GND	7	CTS
4	TxD	8	DTR

8-pin RJ45



CP-114EL/EL-I

4-port RS-232/422/485 PCI Express boards with optional 2 KV isolation

CP-114EL

CP-114EL-I

- PCI Express x1 compliant
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Low profile form factor fits small-sized PCs
- Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64),Linux 2.4, Linux 2.6 (x86/x64), QNX 6, Windows XP Embedded, SCO OpenServer 5/6, UnixWare 7
- 15 KV ESD protection on the board

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CP-114EL and CP-114EL-I are smart, 4-port PCI Express boards designed for POS and ATM applications. The boards are a top choice of industrial automation engineers and system integrators, and support many different operating systems, including Windows and Linux. In addition, each of the boards' 4 RS-232/422/485 serial ports supports a super fast 921.6 Kbps baudrate. The CP-114EL and CP-114EL-I provide full modem control signals to ensure compatibility with a wide range of serial peripherals, and their PCI Express "x1" classification allows the boards to be installed in any PCI Express slot.

Smaller Form Factor

The CP-114EL and CP-114EL-I are low profile boards that are compatible with any PCI Express slot. The boards require only a 3.3 VDC power supply, which means that the boards fit any host computer, ranging from shoebox to standard-sized PCs.

Drivers Provided for Windows, Linux

Moxa continues to support a wide variety of operating systems, and the CP-114EL/EL-I boards are no exception. Reliable Windows COM and Linux TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: 16C550C compatible
Bus: PCI Express x1
Connector: DB44 female

Serial Interface

Number of Ports: 4
Serial Standards: RS-232/422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board
Optical Isolation: 2 KV (CP-114EL-I only)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64), Linux 2.4, Linux 2.6 (x86/x64), QNX 6, Windows XP Embedded, SCO OpenServer 5/6, UnixWare 7

Physical Characteristics

Dimensions:
CP-114EL: 67.21 x 103.58 mm (2.69 x 4.08 in)
CP-114EL-I: 67.21 x 136.93 mm (2.69 x 5.48 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B

EMS: EN55024, EN61000-3-2, EN61000-3-3, EN61000-6-2, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11

Power Requirements

Power Consumption:
CP-114EL: 835 mA @ 3.3 V
CP-114EL-I: 1170 mA @ 3.3 V

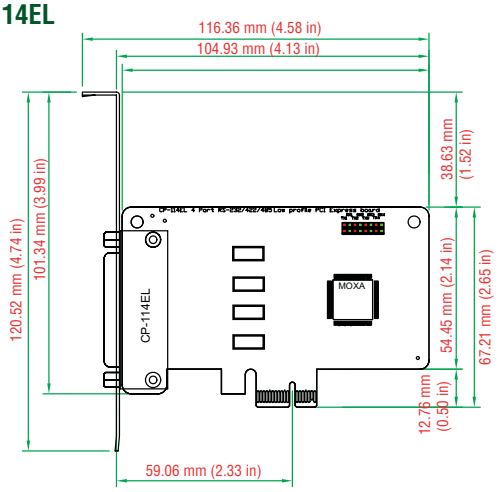
Warranty

Warranty Period: 5 years

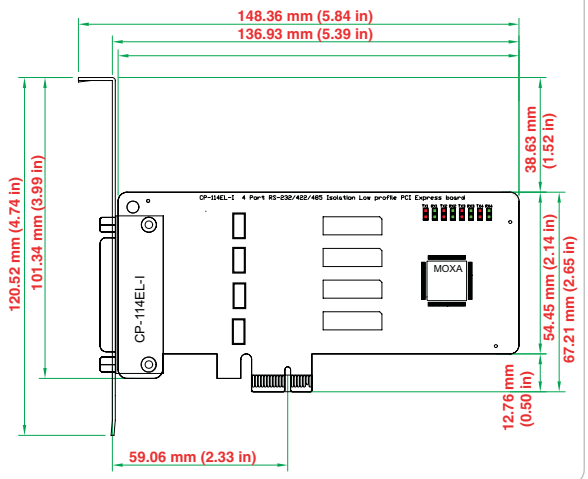
Details: See www.moxa.com/warranty

Dimensions

CP-114EL



CP-114EL-I



Ordering Information

Available Models

CP-114EL: 4-port RS-232/422/485 low profile PCI Express x1 serial board

CP-114EL-I: 4-port RS-232/422/485 low profile PCI Express x1 serial board with optical isolation

CP-114EL-DB9M: 4-port RS-232/422/485 low profile PCI Express x1 serial board (includes DB9 male cable)

CP-114EL-DB25M: 4-port RS-232/422/485 low profile PCI Express x1 serial board (includes DB25 male cable)

CP-114EL-I-DB9M: 4-port RS-232/422/485 low profile PCI Express x1 serial board with optical isolation (includes DB9 male cable)

CP-114EL-I-DB25M: 4-port RS-232/422/485 low profile PCI Express x1 serial board with optical isolation (includes DB25 male cable)

Package Checklist

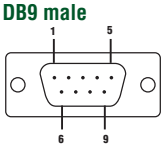
- CP-114EL or CP-114EL-I board
- Standard bracket and low profile bracket
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Connection Options (can be purchased separately)

CBL-M44M9x4-50
DB44 male to DB9 male x 4 (50 cm cable)

PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	TxD-(A)	---
2	RxD	TxD+(B)	TxD+(B)	---
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	RxD-(A)	Data-(A)
5	GND	GND	GND	GND
6	DSR	---	---	---
7	RTS	---	---	---
8	CTS	---	---	---
9	---	---	---	---

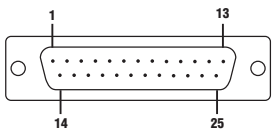
DB9 male



CBL-M44M25x4-50
DB44 male to DB25 male x 4 (50 cm cable)

PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	TxD+(B)	---
4	RTS	---	---	---
5	CTS	---	---	---
6	DSR	---	---	---
7	GND	GND	GND	GND
8	DCD	TxD-(A)	TxD-(A)	---
20	DTR	RxD-(A)	RxD-(A)	Data-(A)
22	---	---	---	---

DB25 male



CP-104EL

4-port RS-232 PCI Express serial board

- PCI Express x1 compliant
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Low profile form factor fits small-sized PCs
- Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64), Windows CE 5.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64) FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7
- Easy maintenance with on-board LEDs and management software
- 15 KV ESD protection on the board

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CP-104EL is a smart, 4-port PCI Express board designed for POS and ATM applications. It is a top choice of industrial automation engineers and system integrators, and supports many different operating systems, including Windows, Linux, and even Unix. In addition, each of the board's 4 RS-232 serial ports supports a super fast 921.6 Kbps baudrate. The CP-104EL provides full modem control signals to ensure compatibility with a wide range of serial peripherals, and its PCI Express "x1" classification allows it to be installed in any PCI Express slot.

Smaller Form Factor

The CP-104EL is a low profile board that is compatible with any PCI Express slot. The board requires only a 3.3 VDC power supply, which means that the board fits any host computer, ranging from shoebox to standard-sized PCs.

Top Serial Performance

Moxa's 20-plus years of experience in serial board design is now concentrated in a new high performance serial data transmission chip. The Turbo Serial Engine™ chip provides serial boards with a 128-byte FIFO, on-chip hardware and software flow control, and burst data mode. Thanks to the Turbo Serial Engine™, Moxa is able to offer the world's best performing smart serial boards.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-104EL board is no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: PCI Express x1
Connector: DB44 female

Serial Interface

Number of Ports: 4
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64), Windows CE 5.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7

Physical Characteristics

Dimensions: 67.21 x 100 mm (2.65 x 3.94 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B

EMS: EN55024, EN61000-3-2, EN61000-3-3, EN61000-6-2, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11

Power Requirements

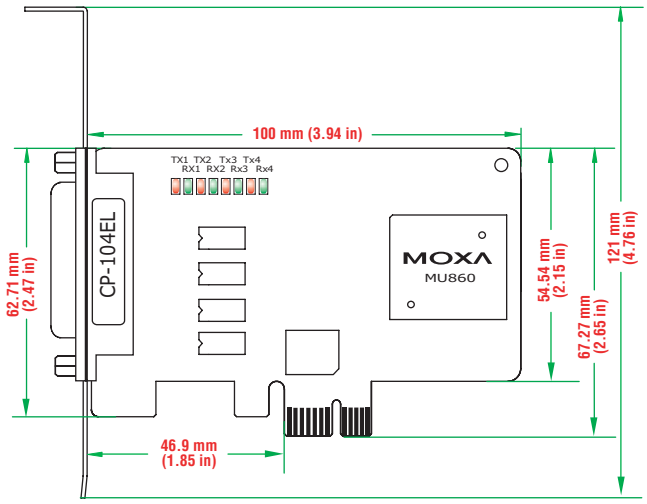
Power Consumption: 430 mA @ 3.3 V

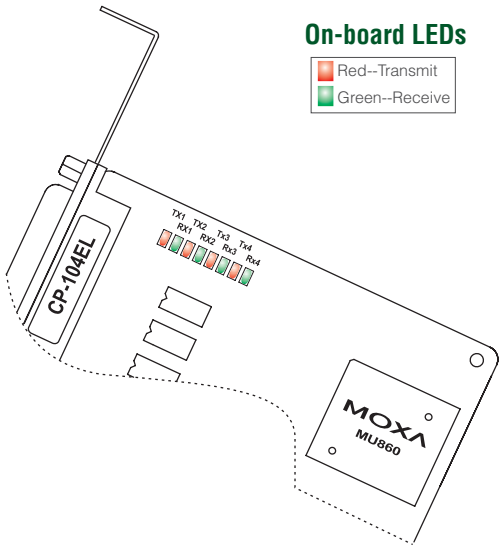
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions





Ordering Information

Available Models

CP-104EL-DB9M: 4-port RS-232 PCI low profile Express x1 serial board (includes DB9 male cable)

CP-104EL-DB25M: 4-port RS-232 low profile PCI Express x1 serial board (includes DB25 male cable)

Package Checklist

- CP-104EL board
- DB9-M or DB25-M connection cable
- Standard bracket and low profile bracket
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

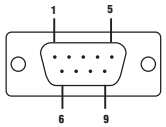
Connection Options (can be purchased separately)

CBL-M44M9x4-50

DB44 male to DB9 male x 4 (50 cm cable)

PIN	RS-232	PIN	RS-232
1	DCD	5	GND
2	RxD	6	DSR
3	TxD	7	RTS
4	DTR	8	CTS

DB9 male

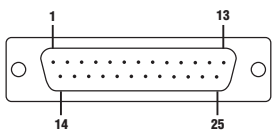


CBL-M44M25x4-50

DB44 male to DB25 male x 4 (50 cm cable)

PIN	RS-232	PIN	RS-232
2	TxD	6	DSR
3	RxD	7	GND
4	RTS	8	DCD
5	CTS	20	DTR

DB25 male



CP-102E/EL

2-port RS-232 PCI Express boards

- PCI Express x1 compliant
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Low profile form factor fits small-sized PCs Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64), Linux 2.4, Linux 2.6 (x86/x64) QNX 6, Windows XP Embedded, SCO OpenServer 5/6, UnixWare 7
- 15 KV ESD protection on the board

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CP-102E and low profile CP-102EL are 2-port PCI Express boards designed for POS and ATM applications. Moxa's PCI Express boards are a top choice of industrial automation engineers and system integrators, particularly since the boards support many different operating systems, including Windows and Linux. The CP-102E/EL's 2 RS-232 serial ports support a super fast 921.6 Kbps baudrate, and provide full modem control signals to ensure compatibility with a wide range of serial peripherals. In addition, the boards' x1 classification allows them to be installed in any PCI Express slot.

Smaller Form Factor

The CP-102EL is a low profile board that is compatible with any PCI Express slot. The CP-102EL board only requires a 3.3 VDC power supply, which means that the board fits any host computer, ranging from shoebox to standard-sized PCs.

Drivers Provided for Windows and Linux

Moxa continues to support a wide variety of operating systems, and the CP-102E/EL boards are no exception. Reliable Windows COM and Linux TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration applications.

Specifications

Hardware

Comm. Controller: 16C550C compatible

Bus: PCI Express x1

Connector:
CP-102E: DB9 male
CP-102EL: DB25 female

Serial Interface

Number of Ports: 2

Serial Standards: RS-232

Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64), Linux 2.4, Linux 2.6 (x86/x64), QNX 6, Windows XP Embedded, SCO OpenServer 5/6, UnixWare 7

Physical Characteristics

Dimensions:
CP-102E: 85.04 x 100 mm (3.40 x 4.00 in)
CP-102EL: 67.21 x 101.97 mm (2.69 x 4.08 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B

EMS: EN55024, EN61000-3-2, EN61000-3-3, EN61000-6-2, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11

Power Requirements

Power Consumption:
CP-102E: 520 mA @ 3.3 V
CP-102EL: 552 mA @ 3.3 V

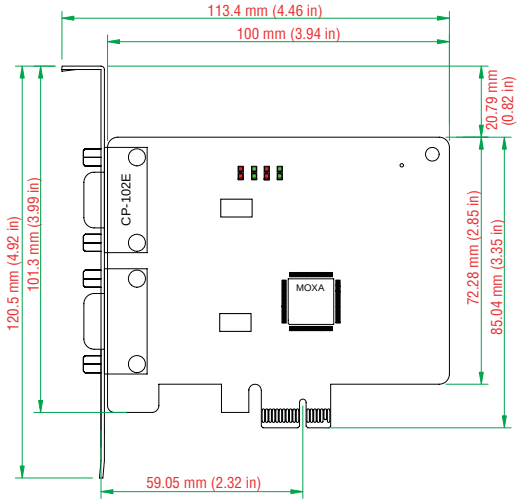
Warranty

Warranty Period: 5 years

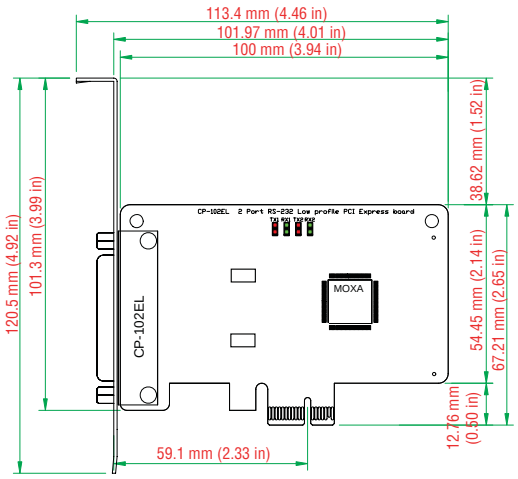
Details: See www.moxa.com/warranty

Dimensions

CP-102E



CP-102EL



Ordering Information

Available Models

CP-102E: 2-port RS-232 PCI Express x1 serial board

CP-102EL-DB9M: 2-port RS-232 low profile PCI Express serial board (includes DB9 male cable)

Package Checklist

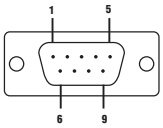
- CP-102E or CP-102EL board
- Low profile bracket (CP-102EL only)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Connection Options (CP-102EL only, can be purchased separately)

CBL-M25M9x2-50
DB25 male to DB9 male x 2 (50 cm cable)

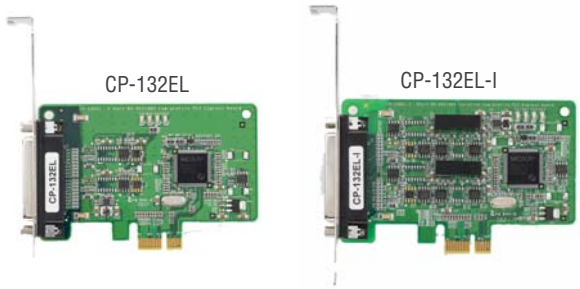
PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

DB9 male



CP-132EL/EL-I

2-port RS-422/485 PCI Express boards with optional 2 KV isolation



- PCI Express x1 compliant
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Low profile form factor fits small-sized PCs
- Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64), Linux 2.4, Linux 2.6 (x86/x64), Windows XP Embedded, SCO OpenServer 5/6, UnixWare 7
- 15 KV ESD protection on the board

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CP-132EL and CP-132EL-I are 2-port PCI Express boards designed for industrial automation applications that require a long distance, multi-point, PC-based data acquisition solution.

RS-485 multidrop for up to 31 devices within 1.2 km

The CP-132EL/EL-I boards have 2 RS-422/485 serial ports, each of which can achieve data rates up to 921.6 Kbps. In RS-485 mode, the boards can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. For long distance RS-485 communication, choose the CP-132EL-I model, which comes with 2 KV optical isolation protection to prevent equipment damage.

Drivers Provided for Windows and Linux

Moxa continues to support a wide variety of operating systems, and the CP-132EL/EL-I boards are no exception. Reliable Windows COM and Linux TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: 16C550C compatible
Bus: PCI Express x1
Connector: DB25 female

Serial Interface

Number of Ports: 2
Serial Standards: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board
Optical Isolation: 2 KV (CP-132EL-I only)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: XON/XOFF

Serial Signals

RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64), Linux 2.4, Linux 2.6 (x86/x64), QNX 6, Windows XP Embedded, SCO OpenServer 5/6, UnixWare 7

Physical Characteristics

Dimensions:
CP-132EL: 67.21 x 101.97 mm (2.65 x 4.08 in)
CP-132EL-I: 67.21 x 103.97 mm (2.65 x 4.16 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B
EMS: EN55024, EN61000-3-2, EN61000-3-3, EN61000-6-2, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11

Power Requirements

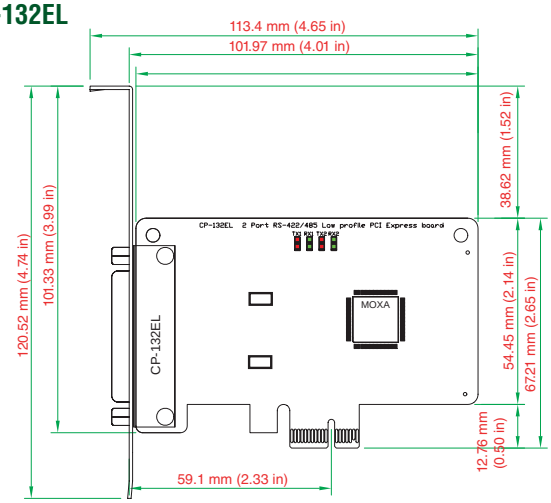
Power Consumption:
CP-132EL: 548 mA @ 3.3 V
CP-132EL-I: 636 mA @ 3.3 V

Warranty

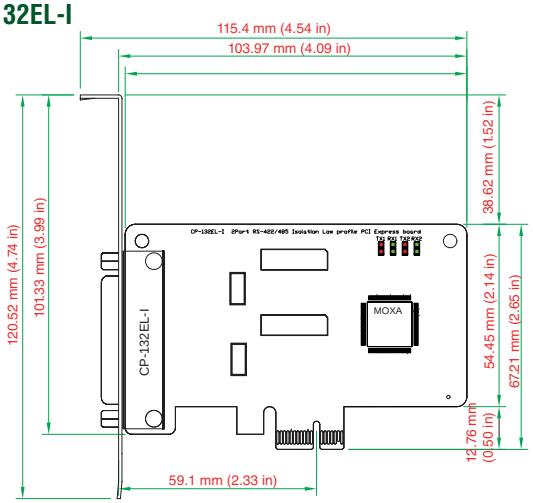
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

CP-132EL



CP-132EL-I



Ordering Information

Available Models

CP-132EL-DB9M: 2-port RS-422/485 low profile PCI Express x1 serial board (includes DB9 male cable)

CP-132EL-I-DB9M: 2-port RS-422/485 low profile PCI Express x1 serial board with optical isolation (includes DB9 male cable)

Package Checklist

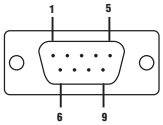
- CP-132EL or CP-132EL-I board
- Low profile bracket
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Connection Options (can be purchased separately)

CBL-M25M9x2-50
DB25 male to DB9 male x 2 (50 cm cable)

PIN	RS-422/RS-485-4w	RS-485-2w
1	TxD-(A)	---
2	TxD+(B)	---
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND
6	---	---
7	---	---
8	---	---

DB9 male

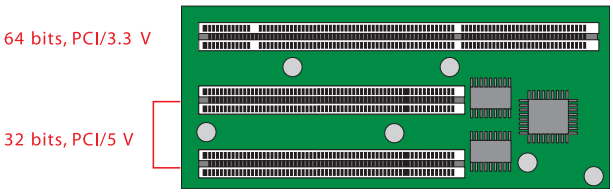


Introduction to Universal PCI

The universal PCI standard was created to give users greater versatility. Universal PCI boards can be used in either 3.3-volt or 5-volt PCI slots, which means that Moxa's universal PCI boards can be used in any PC that has a PCI slot. Choose from boards with 2, 4, or 8 independent serial ports (RS-232, RS-422, RS-485) for connecting data acquisition equipment and other serial devices to your PC.

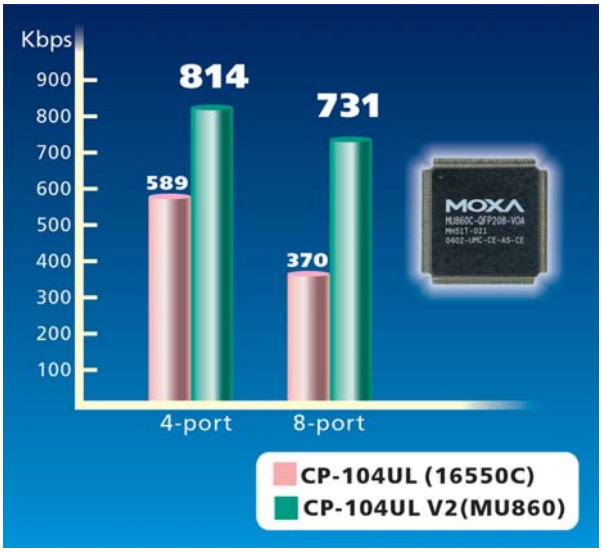
One of the drawbacks of the original PCI bus standard is that it only supports a 32-bit bus and 5V connector key. The need for increased bandwith, reduced power consumption, and high-speed transmission gave rise to a new 64-bit/3.3V PCI standard. Moxa's universal PCI boards have it all:

- Support for both 32-bit and 64-bit PCI buses
- Suport for both 3.3V and 5V connector keys



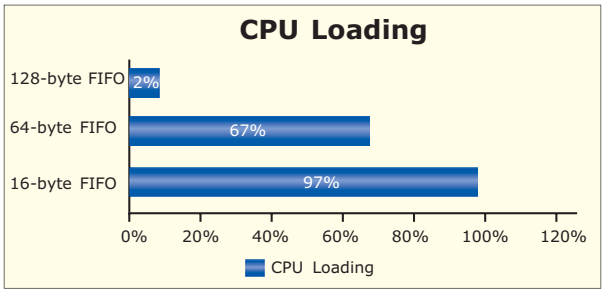
Increased FIFO Buffer for Better Performance

The larger FIFO buffer on Moxa's universal PCI boards takes a big load off your PC's CPU, resulting in better overall performance.



Testing Environment

CPU: AMD-K6-500
Main Board: GA-5AX
Memory: 128 MB
OS: Win2K
Products: CP-104UL (16550C), CP-104UL V2 (MU860)
Ports: 16 ports (4 boards)
Flow Control: Hardware Flow Control
Test Procedure: Performance Analyzer for burn-in test



Forward and Backward Compatibility

Compatible with all major operating systems

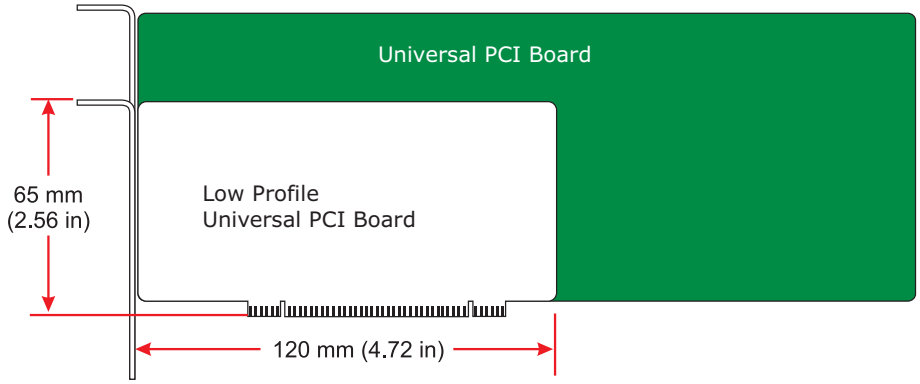
DOS — Win 95 — Win 98 — Win ME — Win NT

Win 2K — Win XP — Win XP Embedded — Win 2003 — Win 64-bit — WEPOS — Win Vista — Win 2008

Linux 2.4 — Linux 2.6 — Linux 64-bit

SCO Open Server 5 — SCO Unixware 7 — SCO Open Server 6

MD1 low profile boards fit most systems



Moxa's universal PCI boards are compatible with Moxa's PCI Boards

CP-168U = C168H/PCI
CP-134U Series = CP-114 Series
CP-104UL = C104H/PCI
CP-132UL Series = CP-132 Series

Universal PCI Board Quick Selection Guide

Interface	Ports	Product	Universal PCI	15 KV ESD Protection	2 KV Optical Isolation	Low Profile	Serial Port Power
RS-232	2	CP-102U	√	√	---	---	---
		CP-102UL	√	√	---	√	---
	4	CP-104UL	√	√	---	√	---
		CP-104JU	√	√	---	---	---
		POS-104UL	√	√	---	√	√
	8	CP-168U	√	√	---	---	---
RS-422/485	2	CP-132UL-I	√	√	√	√	---
		CP-132UL	√	√	---	√	---
	4	CP-134U	√	√	---	---	---
		CP-134U-I	√	√	√	---	---
	8	CP-138U	√	√	---	---	---
		CP-138U-I	√	√	√	---	---
RS-232/422/485	2	CP-112UL	√	√	---	√	---
		CP-112UL-I	√	√	√	√	---
	4	CP-114UL	√	√	---	√	---
		CP-114UL-I	√	√	√	√	---
	8	CP-118U	√	√	---	---	---
		CP-118U-I	√	√	√	---	---
Serial-over-Fiber	2	CP-102UF	√	√	---	---	---

Wide Temperature Models of Moxa's Universal PCI Boards Fit for Harsh Industrial Applications

Industrial applications are often associated with harsh, demanding environments, and of all the features that distinguish industrial products from commercial-grade products, the "Wide Temperature" feature is considered the most important. Facilities or key devices may be located at remote sites where there is no protection from severe weather conditions. For devices that are not designed to tolerate harsh conditions, this often presents significant limitations in how they can be used for the application.

Moxa offers wide temperature Universal PCI models that can operate reliably between -40 and 85˚C. Wide temperature models present a much more reliable and affordable alternative to using regular industrial-grade devices. They are an ideal solution for any application that involves harsh industrial environments, such as power substation automation, intelligent transportation systems, environmental monitoring, manufacturing automation, and other similar systems.

- Outdoor applications, such as deserts or mountains, where it is difficult or costly to build a climate-controlled shelter for sensitive electronic equipment
- Indoor applications, such as in factories or laboratories, where equipment must be placed near machines that generate extreme heat or cold
- Mobile or mixed applications in harsh environments, such as in the military, where machines must operate reliably in low and high temperatures

Moxa's wide temperature Universal PCI boards support an operating temperature range from -40 to 85°C, which is one more reason why Moxa is a leading provider of multiport serial boards.

Wide Temperature Universal PCI Board Quick Selection Guide

Interface	Ports	Product
RS-232	2	CP-102U-T
		CP-102UL-T
	4	CP-104UL-T
		CP-104JU-T
		POS-104UL-T*
	8	CP-168U-T
RS-422/485	2	CP-132UL-T
		CP-132UL-I-T
	4	CP-134U-T
		CP-134U-I-T
	8	CP-138U-T
		CP-138U-I-T
RS-232/422/485	2	CP-112UL-T
		CP-112UL-I-T
	4	CP-114UL-T
		CP-114UL-I-T
	8	CP-118U-T
		CP-118U-I-T
Serial-over-Fiber	2	CP-102UF-T

* Supports power over serial

CASE STUDY

Automated Teller Machine

Reliable and easy integration of peripheral devices

An ATM (Automated Teller Machine) is a computerized telecommunications device that allows customers to conduct financial transactions in a public space without the need for a human clerk or bank teller. Most modern ATMs require customers to insert a credit card sized card, which identifies the customer with a unique card number and additional security information. By using an ATM, customers can access their bank accounts in order to make cash withdrawals, transfer money to other accounts, and check their account balances.

ATMs use an embedded PC that connects to multiple serial peripherals, such as card readers, keypads, touch screens, receipt printers, and cash dispensers. The PC connects to these serial devices through a multiport serial board, and some embedded PCs even require low profile boards due to the limited space available inside a typical ATM.

One of Moxa's customers is an ATM vendor whose business is growing by leaps and bounds due to the booming ATM market in Asia and other parts of the world. To maintain its competitive edge, the vendor turned to Moxa because of the high quality of Moxa's multiport serial boards, and Moxa's proven ability to deliver products on time and with high product reliability.

Forward and Backward Compatibility

- High product reliability and quality
- Small size due to space limitations
- Versatile operating system support
- Good technical support and product service
- Instant troubleshooting

Why Moxa?

- Cost-effective COM port expansion solutions
- Support for a variety of operating systems to reduce the cost of future upgrades
- High MTBF and WHQL (Windows Hardware Qualification Laboratory) certified drivers
- Low profile model suitable for small sized computer
- On-board LED display for monitoring data transmission
- All Moxa products are guaranteed to be of the highest quality and come with a 5-year warranty
- Compatible with 3.3/5 V PCI and PCI-X
- Baudrate up to 921.6 Kbps for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control

Key Products

CP-104UL: 4-port RS-232 low profile Universal PCI board CP-168U: 8-port RS-232 Universal PCI board

Diagram

C320Turbo Series

8 to 32-port intelligent RS-232 Universal PCI and ISA serial boards

- Supports 128 high-performance serial ports per system
- Dramatically decreases host CPU loading
- Modular design makes port expansion easy
- Monitor transmission status with LEDs on the module and two 7-segment displays
- Drivers provided for a broad selection of operating systems
- 460.8 Kbps maximum baudrate

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The intelligent C320Turbo serial boards are expandable and flexible COM/TTY solutions for RS-232 applications that require connecting up to 128 serial devices to one computer. The C320Turbo's on-board CPU and large dual-port memory take the load off host systems whose performance and scalability are critical for large-scale systems.

Drivers Provided for a Broad Selection of Operating Systems

In addition to providing COM port drivers for all major operating systems, Moxa also supports the following dedicated operating systems for customers' special needs.

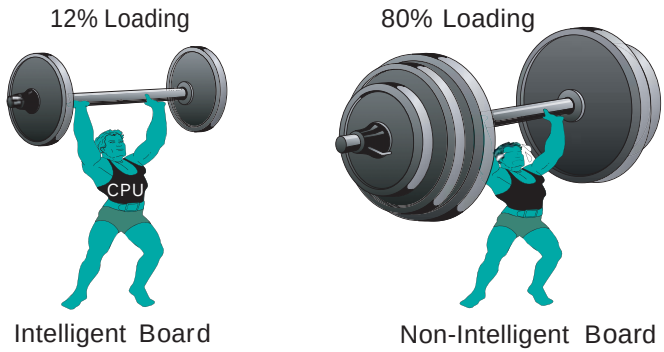
DOS
Windows
Windows (x64)
SCO UnixWare 7
SCO OpenServer 5/6
SCO UNIX SVR 4.2
QNX 4.2x
Linux 2.4/2.6
Linux (x64)

Dramatically Decreases Host Computer's CPU Loading

The C320Turbo boards have a state-of-the-art onboard CPU that dramatically reduces the host computer's loading **by up to 68%*** for applications that use 32 ports per board.

*Testing Environment

- Pentium 4, 1.8 GB CPU, 128 MB RAM
- Windows 2000 Professional
- Moxa PComm Pro Performance Analyzer
- 115.2 Kbps, full duplex, 24-hour burn-in



Specifications

Hardware

Comm. Controller: 16C550C or compatible x 8

Bus:
C320Turbo/PCI: 32-bit Universal PCI
C320Turbo: 16-bit ISA

Connector: DB25 female
Processor: TMS320BC52-40 RISC CPU
Memory: 512 KB

Serial Interface

Number of Ports: 32 per control board (max.)

Serial Standards: RS-232 (RS-422 available with desktop option)

Max. No. of Boards per PC: 4

Performance

Baudrate: 50 bps to 460.8 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

IRQ:
C32010T/PCI: Assigned by BIOS
C32010T: 2 (9), 3, 4, 5, 7, 10 (default), 11, 12, 15

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: TxD+/-, RxD+/-, RTS+/-, CTS+/-, GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), DOS, Linux 2.4, Linux 2.6 (x86/x64), SCO Open Server 5/6, UnixWare 7, QNX 4/6

Physical Characteristics

Dimensions:
C32010T/PCI: 90 x 120 mm (3.54 x 4.72 in)
C32010T: 107 x 158 mm (4.21 x 6.22 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class A

EMS: EN61000-4-2, EN61000-4-3, EN61000-4-4, ENV5204

Power Requirements

Power Consumption:
C32010T/PCI: 500 mA max. @ +5 V
C32010T: 840 mA max. @ +5 V

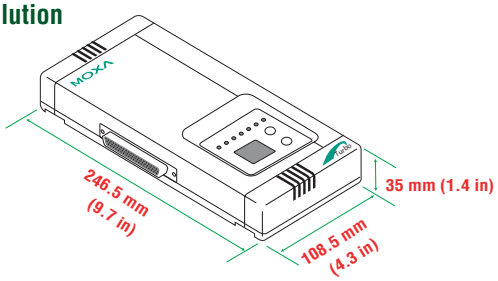
Warranty

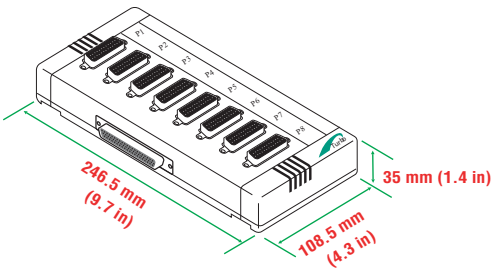
Warranty Period: 5 years

Details: See www.moxa.com/warranty

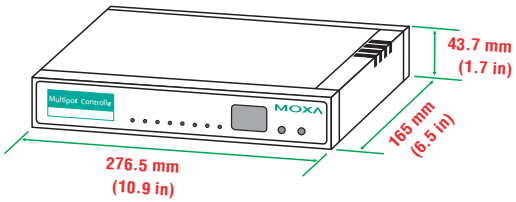
Dimensions

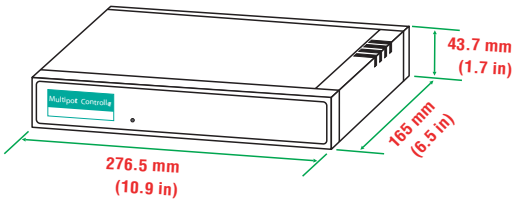
Desktop Solution





Rackmount Solution





	C32010T/ PCI	C32010T	C32030T	C32045T	C32047T	C32061T
Dimensions (mm)	120 x 90 x 15	158 x 107 x 15	247 x 108 x 35	247 x 108 x 35	247 x 108 x 35	247 x 108 x 35
Weight (g)	90	120	425	500	485	488
Power Requirements	0.5A (+5V)	0.84A (+5V)	0.59A (+5V)	0.28A (+5V) 0.095A (+12V) 0.06A (-12V)	0.28A (+5V) 0.095A (+12V) 0.06A (-12V)	0.485A (+5V)

	C32065T	C32071T	C32080T	C32081T	C32082T	C32083T
Dimensions (mm)	247 x 108 x 35	247 x 108 x 35	277 x 165 x 44	277 x 165 x 44	277 x 165 x 44	277 x 165 x 44
Weight (g)	525	525	1020	1120	920	1000
Power Requirements	1.32A (+5V)	0.28A (+5V) 0.095A (+12V) 0.06A (-12V)	0.88A (+5V) 0.095A (+12V) 0.06A (-12V)	1.22A (+5V) 0.19A (+12V) 0.12A (-12V)	0.34A (+5V) 0.095A (+12V) 0.06A (-12V)	0.67A (+5V) 0.19A (+12V) 0.12A (-12V)

Ordering Information

Package Checklist

- C320Turbo/PCI or C320Turbo board
- 2-meter DB25-M to DB25-F connection cable
- Long-range extension kit (optional)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Available Models

Control Boards (must choose one)

C32010T/PCI: Universal PCI board
C32010T: ISA board

External Modules

Rackmount Option

Basic Modules (must choose one)
C32080T: 8 RS-232 ports, 10-pin RJ45 connectors
C32081T: 16-port, RS-232, 10-pin RJ45

Expansion Modules (optional)
C32082T: 8 RS-232 ports, 10-pin RJ45 connectors
C32083T: 16 RS-232 ports, 10-pin RJ45 connectors

Long-range Extension Kit (optional)

C32050T: Includes the following items

- 2 meter DB25-M to DB25-F 10-wire cable (generally used for set-up)
- 90-240 VAC switching power adaptor (0-30°C operating temperature)

NOTE: Build your own DB25-M to DB25-F 10-wire cable for connecting up to 100 meters.

Desktop Option

- CPU module
- One or more UART modules (32 ports maximum per board)

Rackmount Option

- Basic module
- Zero or more expansion modules (32 ports maximum per board)

Connection Cable (required)

C32020T: 2 meter DB25-M to DB25-F cable with 25 pins for short-range usage

Desktop Option

CPU Module (required)
C32030T: Connects directly to one UART module

8-port UART Modules (choose at least one)
C32045T: RS-232, DB25-F connectors
C32047T: RS-232, DB25-M connectors
C32071T: RS-232, DB25-F connectors (25 KV ESD surge protection)
C32061T: RS-422, DB25-F connectors
C32065T: RS-422, DB25-F connectors (2 KV optical isolation)

Ordering Examples

Rackmount Ordering Examples

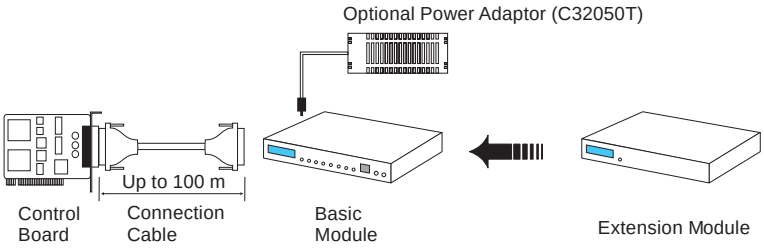
16 RS-232 ports

Control Board: C32010T/PCI
Connection Cable: C32020T
Basic Module: C32081T

32 RS-232 ports

Control Board: C32010T/PCI
Connection Cable: C32020T
Basic Module: C32081T x 1
Expansion Module: C32083T x 1

Rackmount Setup Diagram



Desktop Ordering Examples

8 RS-232 ports

Control Board: C32010T/PCI
Connection Cable: C32020T
CPU Module: C32030T
UART Module: C32045T x 1

8 RS-232 ports + 16 RS-422 ports

Control Board: C32010T/PCI
Connection Cable: C32020T
CPU Module: C32030T
UART Module: C32045T x 1 + C32061T x 2

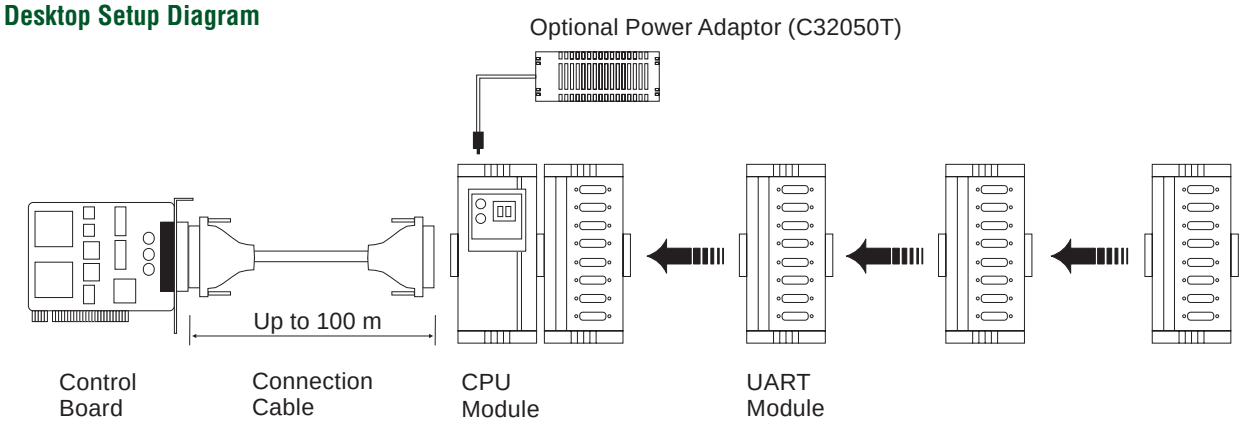
16 RS-232 ports

Control Board: C32010T/PCI
Connection Cable: C32020T
CPU Module: C32030T
UART Module: C32045T x 2 or C32047T x 2

32 RS-232 ports

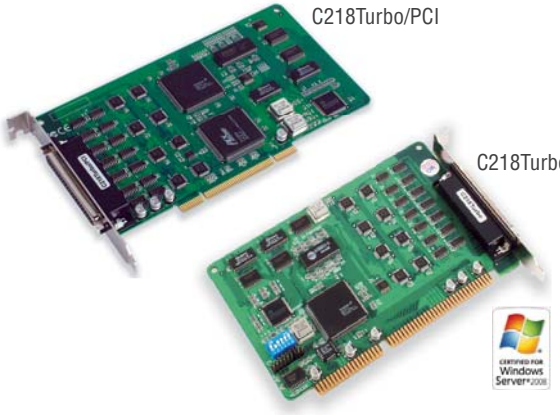
Control Board: C32010T/PCI
Connection Cable: C32020T
CPU Module: C32030T
UART Module: C32045T x 4 or C32047T x 4

Desktop Setup Diagram



C218Turbo Series

8-port RS-232 intelligent Universal PCI and ISA serial boards



- Effectively reduces CPU loading
- Drivers provided for a variety of operating systems (Windows, Linux, and Unix)
- Choose from a wide range of connection cables and boxes
- 921.6 Kbps maximum baudrate for super fast data transmission
- Provides up to 512 KB of embedded memory
- High data throughput for great performance

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The 8-port C218Turbo RS-232 universal PCI and ISA boards come with an ASIC, RISC processor, and large I/O buffer to provide a sustained high throughput on all 8 ports simultaneously. Drivers are available for Windows, Linux, and Unix, making the boards suitable for a wide range of applications. Models are available for PCI, PCI-X, and ISA buses to provide reliable, high performance solutions for multiport serial communications.

Specifications

Hardware

Comm. Controller: 16C550C or compatible x 8

Bus:
C218Turbo/PCI: 32-bit Universal PCI
C218Turbo: 16-bit ISA

Connector: DB62 female

Processor: TMS320BC203-57 RISC CPU

Memory: 512 KB

Serial Interface

Number of Ports: 8

Serial Standards: RS-232 (RS-422/485 with optional accessory)

Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 25 KV per port with connection box Opt8S (must be purchased separately)

Optical Isolation: 500 V with connection box Opt8F (must be purchased separately)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), DOS, Linux 2.4, Linux 2.6 (x86/x64), SCO Open Server 5/6, UnixWare 7, QNX 4/6

Physical Characteristics

Dimensions: 105 x 180 mm (4.13 x 7.09 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class A

EMS: EN55024, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-11 (DIPS)

Power Requirements

Power Consumption:
C218Turbo/PCI: 530 mA max. @ +5 V, 110 mA max. @ +12 V, 35 mA max. @ -12 V
C218Turbo: 400 mA max. @ +5 V, 100 mA max. @ +12 V, 60 mA max. @ -12 V

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Ordering Information

Available Models

C218Turbo/PCI: 8-port RS-232 intelligent Universal PCI serial board
C218Turbo: 8-port RS-232 intelligent ISA serial board

Package Checklist

- C218Turbo/PCI or C218Turbo board
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Connection Options (can be purchased separately)

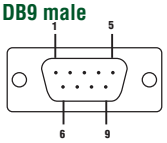
OPT8-M9
DB9 male x 8 (150 cm cable)

CBL-M62M9x8-100 (OPT8D)
DB9 male x 8 (100 cm cable)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR

PIN	RS-232
5	GND
6	DSR
7	RTS
8	CTS

DB9 male



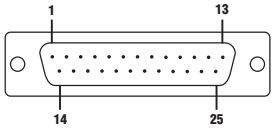
OPT8B
DB25 male x 8 (150 cm cable)

CBL-M62M25x8-100 (OPT8C)
DB25 male x 8 (100 cm cable)

PIN	RS-232
2	TxD
3	RxD
4	RTS
5	CTS

PIN	RS-232
6	DSR
7	GND
8	DCD
20	DTR

DB25 male



OPT8A
DB25 female x 8 (150 cm cable)

OPT8S
DB25 female x 8 (150 cm cable)
25 KV ESD Surge Protection

OPT8F/Z (RS-422)
DB25 female x 8 (150 cm cable)
110 or 230 VAC power adaptor
(115.2 Kbps max. baudrate)

OPT8F with 500 V isolation

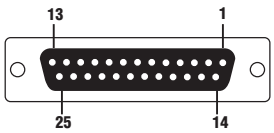
OPT8K (RS-422/485)
DB25 female x 8 (150 cm cable)
110 or 230 VAC power adaptor

PIN	RS-232
2	RxD
3	TxD
4	CTS
5	RTS

PIN	RS-232
6	DTR
7	GND
8	DCD
20	DSR

PIN	RS-422/RS-485-4w	RS-485-2w
2	RxD+(B)	Data+(B)
3	TxD+(B)	---
7	GND	GND
14	RxD-(A)	Data-(A)
16	TxD-(A)	---

DB25 female

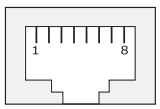


OPT8-RJ45
8-pin RJ45 x 8 (30 cm cable)

PIN	RS-232
1	DSR
2	RTS
3	GND
4	TxD

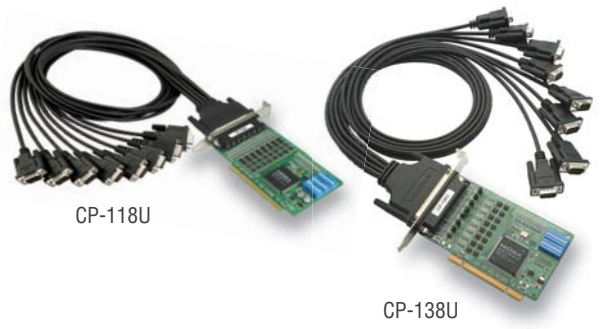
PIN	RS-232
5	RxD
6	DCD
7	CTS
8	DTR

8-pin RJ45



CP-118U/138U

8-port RS-232/422/485 Universal PCI serial board



- Over 700 Kbps data throughput for top performance
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5V PCI and PCI-X
- Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7
- Easy maintenance with on-board LED display, and management software
- 15 KV ESD protection on the board
- Wide temperature model available for -40 to 85°C environments

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CP-118U and CP-138U are smart, 8-port Universal PCI serial boards designed for POS and ATM applications and for use by industrial automation system manufacturers and system integrators. Both boards are compatible with all major operating systems. In addition, the CP-118U's 8 RS-232/422/485 ports and the CP-138U's 8 RS-422/485 ports support data rates up to 921.6 Kbps, and provide full modem control signals to ensure compatibility with a wide range of serial peripherals. The CP-118U and CP-138U support both 3.3V and 5V PCI buses, making them suitable for installation in most PC servers.

Drivers Provided for Windows, Linux, and Unix

One of Moxa's highest priorities is to provide drivers for all mainstream operating systems. Reliable, well-tested Windows COM and Linux/Unix TTY drivers are available for use with the CP-118U and CP-138U serial boards. Other operating systems, such as Windows XP embedded and WEPOS, are also supported to accommodate embedded integration applications.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB62 female

Serial Interface

Number of Ports: 8
Serial Standards:
CP-118U: RS-232/422/485
CP-138U: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7

Physical Characteristics

Dimensions: 82 x 135 mm (3.22 x 5.31 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B
EMS: EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

Power Requirements

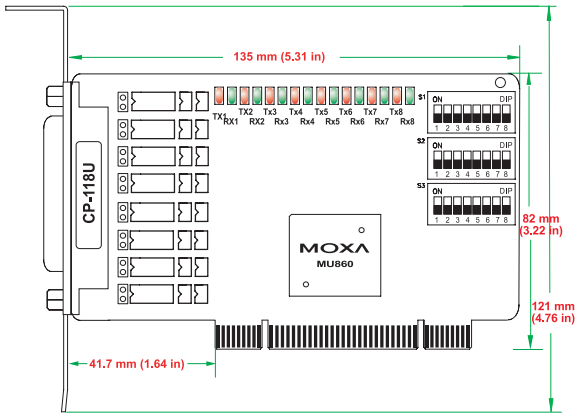
Power Consumption:
CP-118U: 240 mA @ +5 V (RS-232), 300 mA @ +5 V (RS-422)
CP-138U: 135 mA @ +5V (RS-422)

Warranty

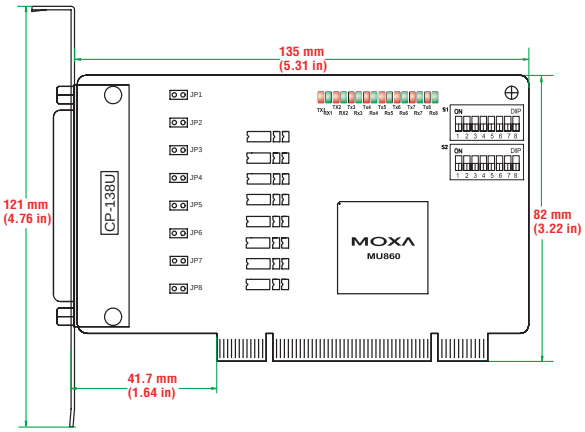
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

CP-118U



CP-138U



Ordering Information

Available Models

CP-118U: 8-port RS-232/422/485 Universal PCI serial board, 0 to 55°C operating temperature

CP-138U: 8-port RS-422/485 Universal PCI serial board, 0 to 55°C operating temperature

CP-118U-T: 8-port RS-232/422/485 Universal PCI serial board, -40 to 85°C operating temperature

CP-138U-T: 8-port RS-422/485 Universal PCI serial board, -40 to 85°C operating temperature

Package Checklist

- CP-118U or CP-138U board
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Connection Options (can be purchased separately)

OPT8-M9

DB9 male x 8 (150 cm cable)

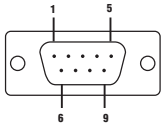
CBL-M62M9x8-100 (OPT8D)

DB9 male x 8 (100 cm cable)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR

PIN	RS-232
5	GND
6	DSR
7	RTS
8	CTS

DB9 male



OPT8B

DB25 male x 8 (150 cm cable)

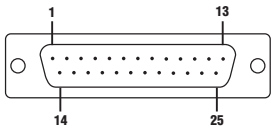
CBL-M62M25x8-100 (OPT8C)

DB25 male x 8 (100 cm cable)

PIN	RS-232
2	TxD
3	RxD
4	RTS
5	CTS

PIN	RS-232
6	DSR
7	GND
8	DCD
20	DTR

DB25 male



OPT8A

DB25 female x 8 (150 cm cable)

OPT8S

DB25 female x 8 (150 cm cable)
25 KV ESD Surge Protection

OPT8F/Z (RS-422)

DB25 female x 8 (150 cm cable)
110 or 230 VAC power adaptor
(115.2 Kbps max. baudrate)

OPT8F with 500 V isolation

OPT8K (RS-422/485)

DB25 female x 8 (150 cm cable)
110 or 230 VAC power adaptor

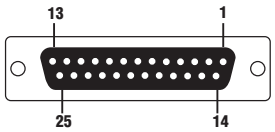
PIN	RS-232
2	RxD
3	TxD
4	CTS
5	RTS

PIN	RS-232
6	DTR
7	GND
8	DCD
20	DSR

PIN	RS-422
2	RxD+(B)
3	TxD+(B)
7	GND
14	RxD-(A)
16	TxD-(A)

PIN	RS-422/RS-485-4w	RS-485-2w
2	RxD+(B)	Data+(B)
3	TxD+(B)	
7	GND	GND
14	RxD-(A)	Data-(A)
16	TxD-(A)	

DB25 female



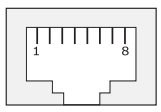
OPT8-RJ45

8-pin RJ45 x 8 (30 cm cable)

PIN	RS-232
1	DSR
2	RTS
3	GND
4	TxD

PIN	RS-232
5	RxD
6	DCD
7	CTS
8	DTR

8-pin RJ45



CP-118U-I/138U-I

8-port RS-232/422/485 Universal PCI serial boards with 2 KV isolation

CP-118U-I

CP-138U-I

- Over 700 Kbps data throughput for top performance
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5V PCI and PCI-X
- Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7
- Easy maintenance with on-board LED display, and management software
- 15 KV ESD protection and 2 KV optical isolation on the board
- Wide temperature model available for -40 to 85°C environment

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CP-118U-I and CP-138U-I are, 8-port serial boards designed for long distance, multi-point, PC-based data acquisition applications. Industrial automation system integrators will be eager to use these boards for many of their industrial automation projects.

On-chip ADDC® for precision RS-485 communication

RS-485 communication requires precise timing control to enable and disable the line driver, and the Moxa Turbo Serial Engine™ chip that powers the CP-118U-I and CP-138U-I boards come with on-chip ADDC® (automatic data direction control) to make RS-485 as easy to use as RS-232.

RS-485 multidrop for up to 31 devices within 1.2 km

The CP-118U-I's 8 RS-232/422/485 ports and the CP-138U-I's 8 RS-422/485 ports can achieve data rates up to 921.6 Kbps, and in RS-485 mode, one serial port can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. In addition, the 2 KV optical isolation protection on the CP-118U-I and CP-138U-I boards helps prevent equipment damage for long distance RS-485 communication.

Top Serial Performance

Moxa's 20-plus years of experience in serial board design is now concentrated in a new high performance serial data transmission chip. The Turbo Serial Engine™ chip provides serial boards with a 128-byte FIFO, on-chip hardware and software flow control, and burst data mode. Thanks to the Turbo Serial Engine™, Moxa is able to offer the world's best performing smart serial boards.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-118U-I and CP-138U-I boards are no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for most Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB78 female

Serial Interface

Number of Ports: 8
Serial Standards:
CP-118U-I: RS-232/422/485
CP-138U-I: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board
Optical Isolation: 2 KV

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND

RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND

RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7

Physical Characteristics

Dimensions: 105 x 133 mm (4.13 x 5.23 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B

EMS: EN55022, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

Power Requirements

Power Consumption:
CP-118U-I: 860 mA @ +5 V
CP-138U-I: 330 mA @ +5V

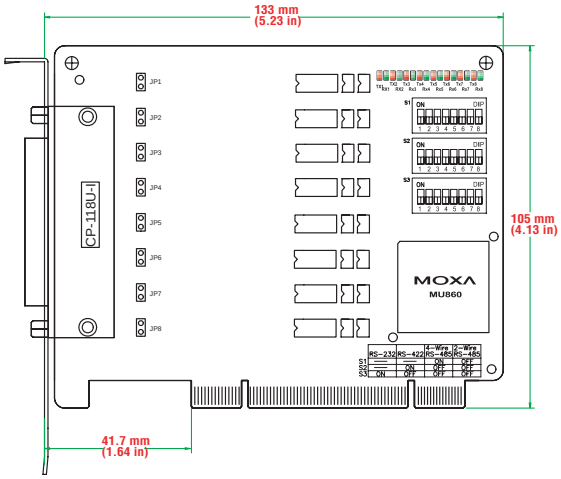
Warranty

Warranty Period: 5 years

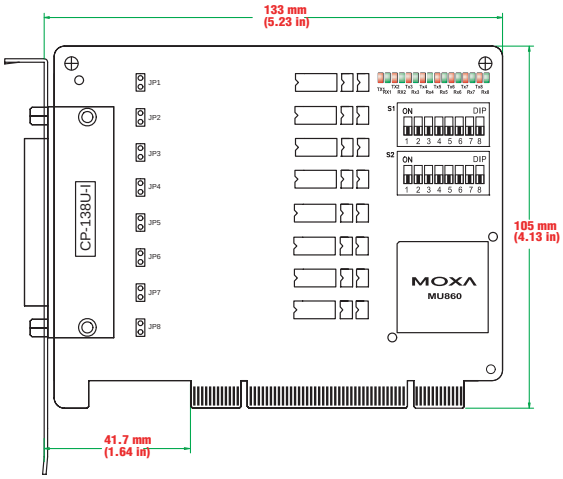
Details: See www.moxa.com/warranty

Dimensions

CP-118U-I



CP-138U-I



Ordering Information

Available Models

CP-118U-I: 8-port RS-232/422/485 Universal PCI serial board with optical isolation, 0 to 55°C operating temperature

CP-138U: 8-port RS-422/485 Universal PCI serial board with optical isolation, 0 to 55°C operating temperature

CP-118U-I-T: 8-port RS-232/422/485 Universal PCI serial board with optical isolation, -40 to 85°C operating temperature

CP-138U-T: 8-port RS-422/485 Universal PCI serial board with optical isolation, -40 to 85°C operating temperature

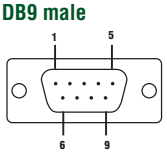
Package Checklist

- CP-118U-I or CP-138U-I board
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Connection Options (can be purchased separately)

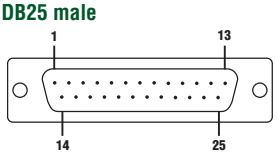
CBL-M78M9x8-100

DB9 male



CBL-M78M25x8-100

DB25 male



CP-168U

8-port RS-232 Universal PCI serial board

- Over 700 Kbps data throughput for top performance
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Choose from a wide range of connection cables and boxes
- Compatible with 3.3/5V PCI and PCI-X
- Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7
- 15 KV ESD protection on the board
- Wide temperature model available for -40 to 85°C environment

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CP-168U is a smart, 8-port universal PCI board designed for POS and ATM applications. It is a top choice of industrial automation engineers and system integrators, and supports many different operating systems, including Windows, Linux, and even Unix. In addition, each of the board's 8 RS-232 serial ports supports a super fast 921.6 Kbps baudrate. The CP-168U provides full modem control signals to ensure compatibility with a wide range of serial peripherals, and works with both 3.3V and 5V PCI buses, allowing the board to be installed in virtually any available PC server.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)

Bus: 32-bit Universal PCI

Connector: DB62 female

Serial Interface

Number of Ports: 8

Serial Standards: RS-232

Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Optical Isolation: 500 V with connection box Opt8F (must be purchased separately)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF

I/O Address: Assigned by BIOS

IRQ: Assigned by BIOS

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7

Physical Characteristics

Dimensions: 82 x 120 mm (3.22 x 4.72 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B

EMS: EN55022, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

Power Requirements

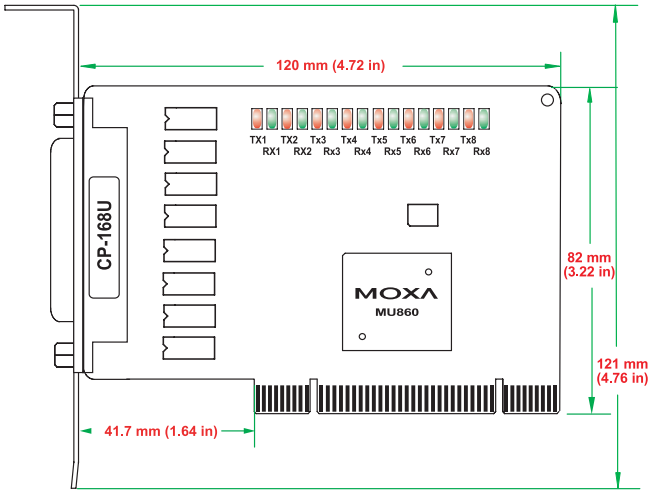
Power Consumption: 180 mA @ +5 V

Warranty

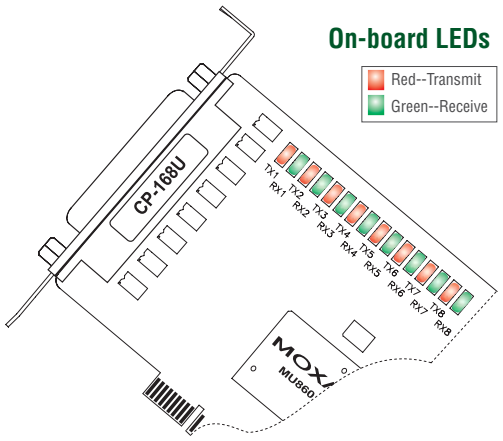
Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



On-board LEDs



Ordering Information

Available Models

CP-168U: 8-port RS-232 Universal PCI serial board, 0 to 55°C operating temperature

CP-168U-T: 8-port RS-232 Universal PCI serial board, -40 to 85°C operating temperature

Package Checklist

- CP-168U board
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Connection Options (can be purchased separately)

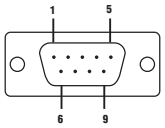
OPT8-M9
DB9 male x 8 (150 cm cable)

CBL-M62M9x8-100 (OPT8D)
DB9 male x 8 (100 cm cable)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR

PIN	RS-232
5	GND
6	DSR
7	RTS
8	CTS

DB9 male



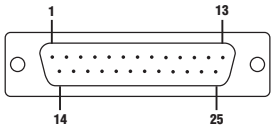
OPT8B
DB25 male x 8 (150 cm cable)

CBL-M62M25x8-100 (OPT8C)
DB25 male x 8 (100 cm cable)

PIN	RS-232
2	TxD
3	RxD
4	RTS
5	CTS

PIN	RS-232
6	DSR
7	GND
8	DCD
20	DTR

DB25 male



OPT8A
DB25 female x 8 (150 cm cable)

OPT8S
DB25 female x 8 (150 cm cable)
25 KV ESD Surge Protection

OPT8F/Z (RS-422)
DB25 female x 8 (150 cm cable)
110 or 230 VAC power adaptor
(115.2 Kbps max. baudrate)

OPT8F with 500 V isolation

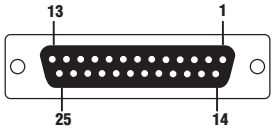
OPT8K(RS-422/485)
DB25 female x 8 (150 cm cable)
110 or 230 VAC power adaptor

PIN	RS-232
2	RxD
3	TxD
4	CTS
5	RTS

PIN	RS-232
6	DTR
7	GND
8	DCD
20	DSR

PIN	RS-422/RS-485-4w	RS-485-2w
2	RxD+(B)	Data+(B)
3	TxD+(B)	
7	GND	GND
14	RxD-(A)	Data-(A)
16	TxD-(A)	

DB25 female

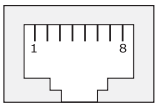


OPT8-RJ45
8-pin RJ45 x 8 (30 cm cable)

PIN	RS-232
1	DSR
2	RTS
3	GND
4	TxD

PIN	RS-232
5	RxD
6	DCD
7	CTS
8	DTR

8-pin RJ45



CP-114UL/UL-I

4-port RS-232/422/485 Universal PCI serial board with optional 2 KV isolation

- Over 700 Kbps data throughput for top performance
- 128-byte FIFO and on-chip H/W, S/W flow control
- Universal PCI compatible with 3.3/5 V PCI and PCI-X
- Serial communication speed up to 921.6 Kbps
- Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7
- Easy maintenance with on-board LED display
- On-board 15 KV ESD and 2 KV optical isolation protection
- Wide temperature model available for -40 to 85°C environment

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

Moxa's CP-114UL/UL-I series of multiport serial boards are designed to be used by industrial automation system integrators for long distance, multi-point, PC-based data acquisition applications. On-chip Automatic Data Direction Control for precision RS-485 communication requires precise timing control to enable and disable the line driver. The Moxa Turbo Serial Engine™ chip that powers the CP-114UL/UL-I boards come with on-chip ADDC®, which makes RS-485 as easy to use as RS-232. In RS-485 mode, the serial port can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. For long distance RS-485 communication, 2 KV optical isolation protections are available to prevent equipment damage.

Support for Major Windows and Linux/Unix OS drivers

Moxa continues to support a wide variety of operating systems, and the CP-114UL/UL-I boards are no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB44 female

Serial Interface

Number of Ports: 4
Serial Standards: RS-232/422/485
Max. Number of Boards per PC: 4
ESD Protection: 15 KV on the board
Optical Isolation: 2 KV (CP-114UL-I only)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7

Physical Characteristics

Dimensions: 64.4 x 120 mm (2.53 x 4.72 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B

EMS: EN55022, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

Power Requirements

Power Consumption:
CP-114UL: 320 mA @ +5 V (for RS-232)

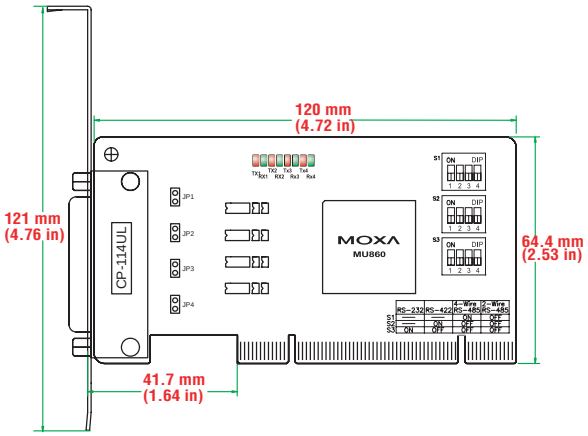
Warranty

Warranty Period: 5 years

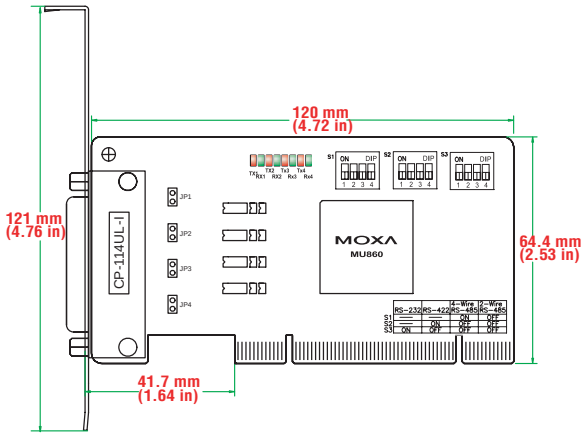
Details: See www.moxa.com/warranty

Dimensions

CP-114UL



CP-114UL-I



Ordering Information

Available Models

CP-114UL: 4-port RS-232/422/485 low profile Universal PCI board, 0 to 55°C operating temperature

CP-114UL-DB9: 4-port RS-232/422/485 low profile Universal PCI serial board, 0 to 55°C operating temperature (includes DB9 male cable)

CP-114UL-DB25: 4-port RS-232/422/485 low profile Universal PCI serial board, 0 to 55°C operating temperature (includes DB25 male cable)

CP-114UL-I: 4-port RS-232/422/485 low profile Universal PCI serial board with optical isolation, 0 to 55°C operating temperature

CP-114UL-I-DB9: 4-port RS-232/422/485 low profile Universal PCI serial board with optical isolation, 0 to 55°C operating temperature (includes DB9 male cable)

CP-114UL-I-DB25: 4-port RS-232/422/485 low profile Universal PCI serial board with optical isolation, 0 to 55°C operating temperature (includes DB25 male cable)

CP-114UL-T: 4-port RS-232/422/485 low profile Universal PCI serial board, -40 to 85°C operating temperature

CP-114UL-I-T: 4-port RS-232/422/485 low profile Universal PCI serial board with optical isolation, -40 to 85°C operating temperature

Package Checklist

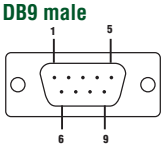
- CP-114UL or CP-114UL-I board
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Connection Options (can be purchased separately)

CBL-M44M9x4-50
DB44 male to DB9 male x 4
(50 cm cable)

PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	TxD-(A)	---
2	RxD	TxD+(B)	TxD+(B)	---
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	RxD-(A)	Data-(A)
5	GND	GND	GND	GND
6	DSR	---	---	---
7	RTS	---	---	---
8	CTS	---	---	---
9	---	---	---	---

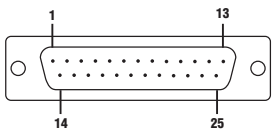
DB9 male



CBL-M44M25x4-50
DB44 male to DB25 male x 4
(50 cm cable)

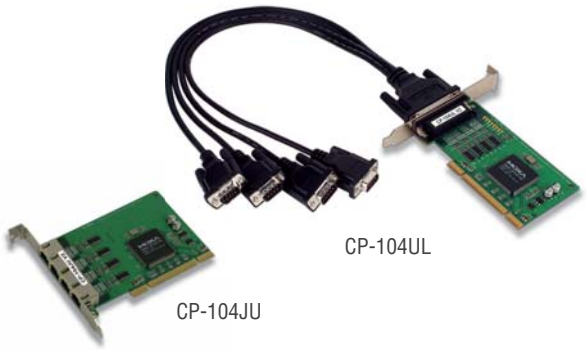
PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	TxD+(B)	---
4	RTS	---	---	---
5	CTS	---	---	---
6	DSR	---	---	---
7	GND	GND	GND	GND
8	DCD	TxD-(A)	TxD-(A)	---
20	DTR	RxD-(A)	RxD-(A)	Data-(A)
22	---	---	---	---

DB25 male



CP-104UL/JU

4-port RS-232 smart Universal PCI serial boards



- Over 800 Kbps data throughput for top performance
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5V PCI and PCI-X
- Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7
- 15 KV ESD protection on the board
- Wide temperature model available for -40 to 85°C environments

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CP-104UL and CP-104JU 4-port universal PCI boards are designed for POS and ATM applications. They are a top choice of industrial automation engineers and system integrators, and support many different operating systems, including Windows, Linux, and even Unix. In addition, each of the boards' RS-232 serial ports supports a super fast 921.6 Kbps baudrate. The CP-104UL and CP-104JU provide full modem control signals to ensure compatibility with a wide range of serial peripherals, and they work with both 3.3V and 5V PCI buses, allowing the boards to be installed in virtually any available PC server.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connectors:
CP-104UL: DB44 female
CP-104JU: RJ45 x 4

Serial Interface

Number of Ports: 4
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7

Physical Characteristics

Dimensions:
CP-104UL: 64.4 x 120 mm (2.53 x 4.72 in)
CP-104JU: 83 x 120 mm (3.27 x 4.72 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B
EMS: EN55022, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

Power Requirements

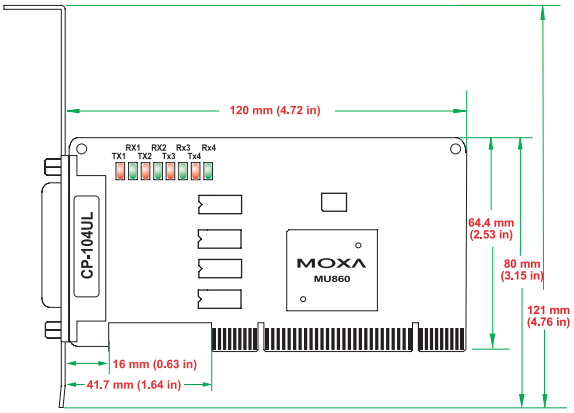
Power Consumption:
CP-104UL: 120 mA @ +5 V
CP-104JU: 135 mA @ +5 V

Warranty

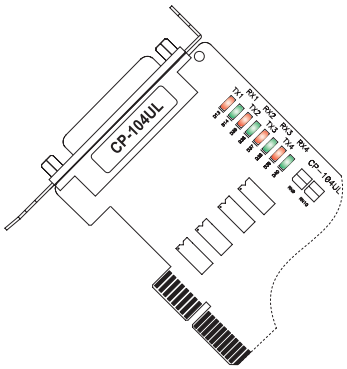
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

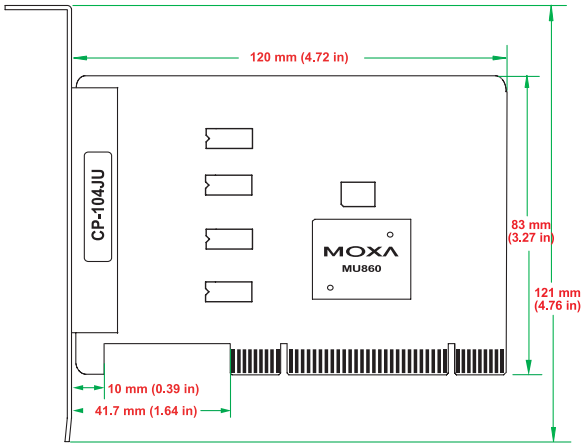
CP-104UL

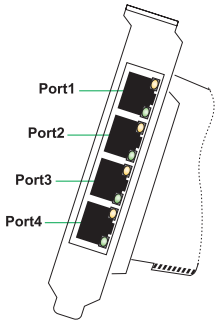


On-board LEDs



CP-104JU





Ordering Information

Available Models

CP-104UL-DB9: 4-port RS-232 low profile Universal PCI serial board, 0 to 55°C operating temperature (includes DB9 male cable)

CP-104UL-DB25: 4-port RS-232 low profile Universal PCI serial board, 0 to 55°C operating temperature (includes DB25 male cable)

CP-104JU: 4-port RS-232 Universal PCI serial board with RJ45 ports on the board, 0 to 55°C operating temperature

CP-104UL-T: 4-port RS-232 low profile Universal PCI serial board, -40 to 85°C operating temperature

CP-104JU-T: 4-port RS-232 Universal PCI serial board with RJ45 ports on the board, -40 to 85°C operating temperature

Package Checklist

- CP-104UL or CP-104JU board
- Low profile bracket (CP-104UL only)
- DB9-M or DB25-M cable included (CP-104UL only)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Connection Options (can be purchased separately)

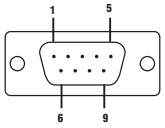
CBL-M44M9x4-50
DB44 male to DB9 male x 4 (50 cm cable)

CBL-RJ45M9-150
8-pin RJ45 to DB9 male (150 cm cable)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR

PIN	RS-232
5	GND
6	DSR
7	RTS
8	CTS

DB9 male



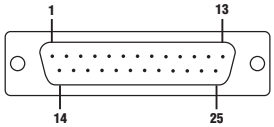
CBL-M44M25x4-50
DB44 male to DB25 male x 4 (50 cm cable)

CBL-RJ45M25-150
8-pin RJ45 to DB25 male (150-cm cable)

PIN	RS-232
2	TxD
3	RxD
4	RTS
5	CTS

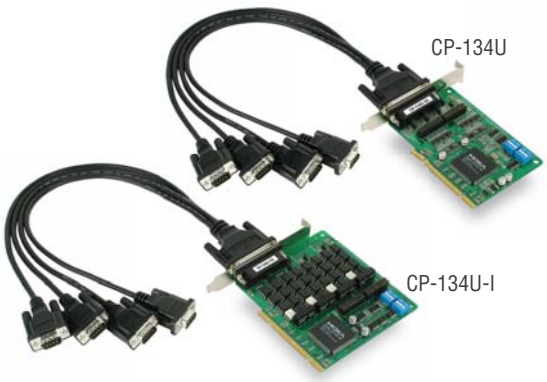
PIN	RS-232
6	DSR
7	GND
8	DCD
20	DTR

DB25 male



CP-134U/U-I

4-port RS-422/485 Universal PCI serial boards with optional 2 KV isolation



- Over 700 Kbps data throughput for top performance
- 921.6 Kbps maximum baudrate for super fast data transmission
- ADDC® provides automatic data direction control for RS-485 signals
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5V PCI and PCI-X
- Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO OpenServer 5/6, UnixWare 7
- 15 KV ESD protection on the board
- Added bonus! Ports 1 and 2 support RS-232 and RS-422/485
- Wide temperature model available for -40 to 85°C environments

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CP-134U and CP-134U-I 4-port universal PCI boards are designed for industrial automation applications that require a long distance, multi-point, PC-based data acquisition solution.

On-chip Automatic Data Direction Control for precision RS-485 communication

RS-485 communication requires precise timing control to enable and disable the line driver. The Moxa Turbo Serial Engine™ chip that powers the CP-134U board comes with on-chip ADDC®, which makes RS-485 as easy to use as RS-232.

RS-485 multidrop for up to 31 devices within 1.2 km

The CP-134U universal PCI board has 4 RS-422/485 serial ports, each of which can achieve data rates up to 921.6 Kbps. In RS-485 mode, the board can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. For long distance RS-485 communication, choose the CP-134U-I, which comes with 2 KV optical isolation protection to prevent equipment damage.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-134U and CP-134U-I boards are no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB44 female

Serial Interface

Number of Ports: 4
Serial Standards: 2 x RS-232/422/485, 2 x RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board
Optical Isolation: 2 KV (CP-134U-I configured for RS-422/485 only)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO OpenServer 5/6, UnixWare 7

Physical Characteristics

Dimensions:
CP-134U: 82.5 x 120 mm (3.24 x 4.72 in)
CP-134U-I: 115 x 120 mm (4.52 x 4.72 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B
EMS: EN55022, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

Power Requirements

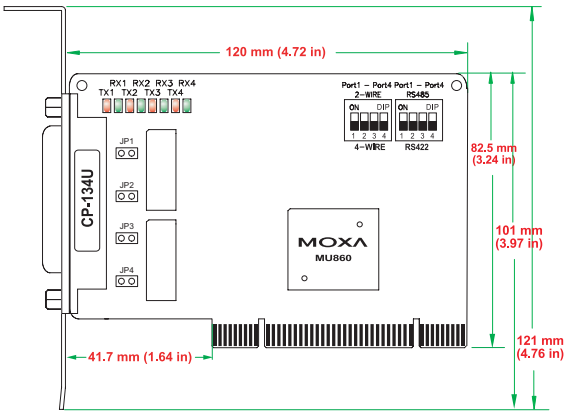
Power Consumption:
CP-134U: 180 mA @ +5 V
CP-134U-I: 850 mA @ +5 V

Warranty

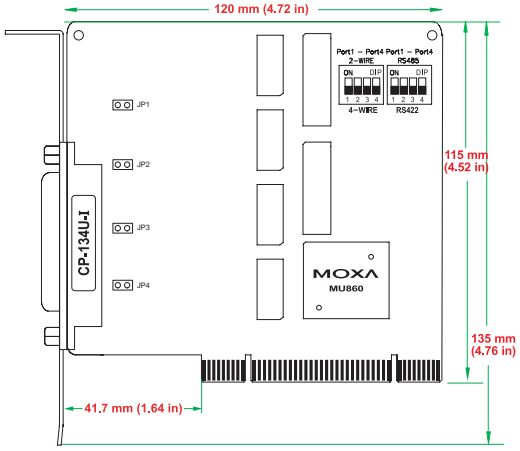
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

CP-134U



CP-134U-I



Ordering Information

Available Models

CP-134U: 4-port RS-422/485 Universal PCI serial board, 0 to 55°C operating temperature
CP-134U-DB9M: 4-port RS-422/485 Universal PCI serial board, 0 to 55°C operating temperature (includes DB9 male cable)
CP-134U-DB25M: 4-port RS-422/485 Universal PCI serial board, 0 to 55°C operating temperature (includes DB25 male cable)
CP-134U-I: 4-port RS-422/485 Universal PCI serial board with optical isolation, 0 to 55°C operating temperature
CP-134U-I-DB9M: 4-port RS-422/485 Universal PCI serial board with optical isolation, 0 to 55°C operating temperature (includes DB9 male cable)
CP-134U-I-DB25M: 4-port RS-422/485 Universal PCI serial board with optical isolation, 0 to 55°C operating temperature (includes DB25 male cable)
CP-134U-T: 4-port RS-422/485 Universal PCI serial board, -40 to 85°C operating temperature
CP-134U-I-T: 4-port RS-422/485 Universal PCI serial board with optical isolation, -40 to 85°C operating temperature

Package Checklist

- CP-134U or CP-134U-I board
- DB9 or DB25 cable included
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

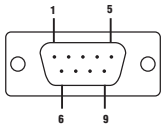
Connection Options (can be purchased separately)

CBL-M44M9x4-50

DB44 male to DB9 male x 4 (50 cm cable)

PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	TxD-(A)	---
2	RxD	TxD+(B)	TxD+(B)	---
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	RxD-(A)	Data-(A)
5	GND	GND	GND	GND
6	DSR	---	---	---
7	RTS	---	---	---
8	CTS	---	---	---
9	---	---	---	---

DB9 male

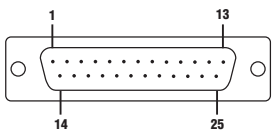


CBL-M44M25x4-50

DB44 male to DB25 male x 4 (50 cm cable)

PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	TxD+(B)	---
4	RTS	---	---	---
5	CTS	---	---	---
6	DSR	---	---	---
7	GND	GND	GND	GND
8	DCD	TxD-(A)	TxD-(A)	---
20	DTR	RxD-(A)	RxD-(A)	Data-(A)
22	---	---	---	---

DB25 male



CP-112UL/UL-I Series

2-port RS-232/422/485 Universal PCI serial boards with optional 2 KV isolation

CP-112UL-I

CP-112UL

- Over 700 Kbps data throughput for top performance
- 128-byte FIFO and on-chip H/W, S/W flow control
- Universal PCI compatible with 3.3/5 V PCI and PCI-X
- Serial communication speed up to 921.6 Kbps
- Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64), Windows CE 5.0/6.0, Windows XP Embedded, Linux 2.4, Linux 2.6 (x86/x64), SCO OpenServer 5/6, UnixWare 7
- Easy maintenance with on-board LED display
- On-board 15 KV ESD and 2 KV optical isolation protection
- Wide temperature model available for -40 to 85°C environments

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

Moxa's CP-112UL/UL-I series of multiport serial boards are designed to be used by industrial automation system integrators for long distance, multi-point, PC-based data acquisition applications. On-chip Automatic Data Direction Control for precision RS-485 communication requires precise timing control for enabling and disabling the line driver. The Moxa Turbo Serial Engine™ chip that powers the CP-112UL/UL-I boards comes with on-chip ADDC®, which makes RS-485 as easy to use as RS-232. The boards come with 2 RS-422/485 serial ports, each of which can achieve data rates up to 921.6 Kbps. In RS-485 mode, the serial port can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. For long distance RS-485 communication, 2 KV optical isolation protection is available to prevent equipment damage.

Support for Major Windows and Linux/Unix OS drivers

Moxa continues to support a wide variety of operating systems, and the CP-112UL/UL-I boards are no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB25 female

Serial Interface

Number of Ports: 2
Serial Standards: RS-232/422/485
Max. Number of Boards per PC: 4
ESD Protection: 15 KV on the board
Optical Isolation: 2 KV (CP-112UL-I only)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64), Windows CE 5.0/6.0, Windows XP Embedded, Linux 2.4, Linux 2.6 (x86/x64), SCO OpenServer 5/6, UnixWare 7

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B
EMS: EN55022, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

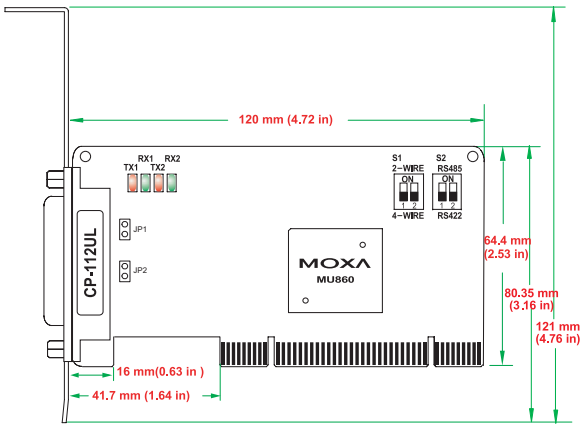
Warranty

Warranty Period: 5 years

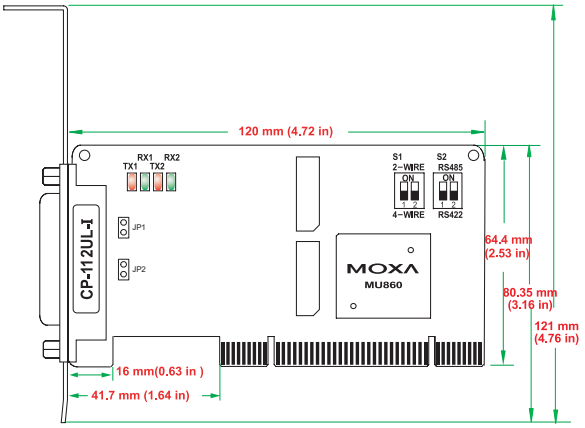
Details: See www.moxa.com/warranty

Dimensions

CP-112UL



CP-112UL-I



Ordering Information

Available Models

CP-112UL-DB9: 2-port RS-232/422/485 low profile Universal PCI board, 0 to 55°C operating temperature (includes DB9 male cable)

CP-112UL-I-DB9: 2-port RS-232/422/485 low profile Universal PCI board with optical isolation, 0 to 55°C operating temperature (includes DB9 male cable)

CP-112UL-T: 2-port RS-232/422/485 low profile Universal PCI board, -40 to 85°C operating temperature

CP-112UL-I-T: 2-port RS-232/422/485 low profile Universal PCI board with optical isolation, -40 to 85°C operating temperature

Package Checklist

- CP-112UL or CP-112UL-I board
- Low profile bracket
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

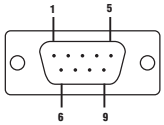
Connection Options (can be purchased separately)

CBL-M25M9x2-50

DB25 male to DB9 male x 2 (50 cm cable)

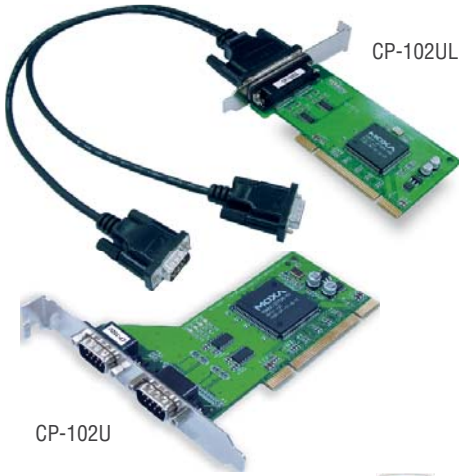
PIN	RS-232	RS-422	RS-485-4W	RS-485-2W
1	DCD	Txd-(A)	Txd-(A)	---
2	RxD	Txd+(B)	Txd+(B)	---
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	RxD-(A)	Data+(A)
5	GND	GND	GND	GND
6	DSR	---	---	---
7	RTS	---	---	---
8	CTS	---	---	---
9	---	---	---	---

DB9 male



CP-102U/UL

2-port RS-232 Universal PCI serial boards



- Over 800 Kbps data throughput for top performance
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5V PCI and PCI-X
- Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7
- 15 KV ESD protection on the board
- The CP-102UL's MD1 low profile form factor fits small-sized PCs
- Wide temperature model available for -40 to 85°C environments

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CP-102U and CP-102UL are 2-port Universal PCI boards designed for POS and ATM applications. They are a top choice of industrial automation engineers and system integrators, and support many different operating systems, including Windows, Linux, and even Unix. In addition, each of the boards' RS-232 serial ports supports a super fast 921.6 Kbps baudrate. The CP-102U and CP-102UL provide full modem control signals to ensure compatibility with a wide range of serial peripherals, and they work with both 3.3V and 5V PCI buses, allowing the boards to be installed in virtually any available PC server.

Designed for Standard and Small-sized PCs

The CP-102UL is a low profile board that only requires a 5 VDC power supply. It is compatible with both a 3.3V and 5V PCI bus, which means that the CP-102UL fits any host computer, ranging from shoebox to standard-sized PCs.

Top Serial Performance

Moxa's 20-plus years of experience in serial board design is now concentrated in a new high performance serial data transmission chip. The Turbo Serial Engine™ chip provides serial boards with a 128-byte FIFO, on-chip hardware and software flow control, and burst data mode. Thanks to the Turbo Serial Engine™, Moxa is able to offer the world's best performing smart serial boards.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-102U/UL boards are no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector:
CP-102U: DB9 male x 2
CP-102UL: DB25 female

Serial Interface

Number of Ports: 2 (only one IRQ required)
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7

Physical Characteristics

Dimensions:
CP-102U: 120 x 120 mm (3.15 x 4.72 in)
CP-102UL: 64.5 x 120 mm (2.53 x 4.72 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B
EMS: EN55022, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

Power Requirements

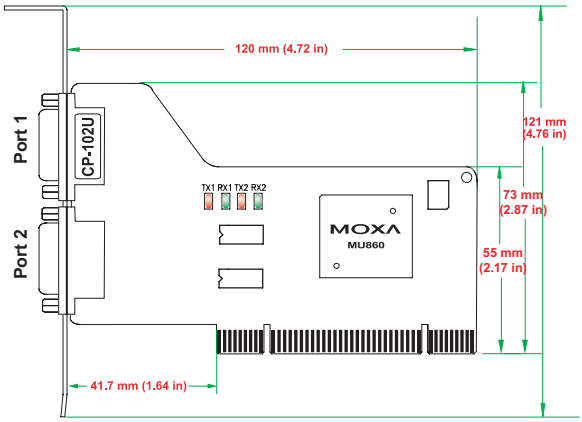
Power Consumption: 93 mA @ +5 V

Warranty

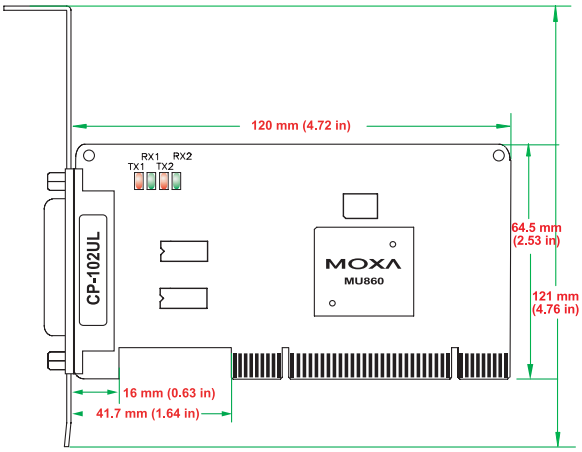
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

CP-102U



CP-102UL



Ordering Information

Available Models

CP-102U: 2-port RS-232 Universal PCI serial board, 0 to 55°C operating temperature

CP-102UL-DB9M: 2-port RS-232 low profile Universal PCI serial board, 0 to 55°C operating temperature (includes DB9 male cable)

CP-102U-T: 2-port RS-232 Universal PCI serial board, -40 to 85°C operating temperature

CP-102UL-T: 2-port RS-232 low profile Universal PCI serial board, -40 to 85°C operating temperature

Package Checklist

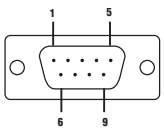
- CP-102U or CP-102UL board
- Document and Software CD
- Low profile bracket (CP-102UL only)
- Quick Installation Guide (printed)
- Warranty Card

Connection Options (can be purchased separately)

CBL-M25M9x2-50
DB25 male to DB9 male x 2 (50 cm cable)

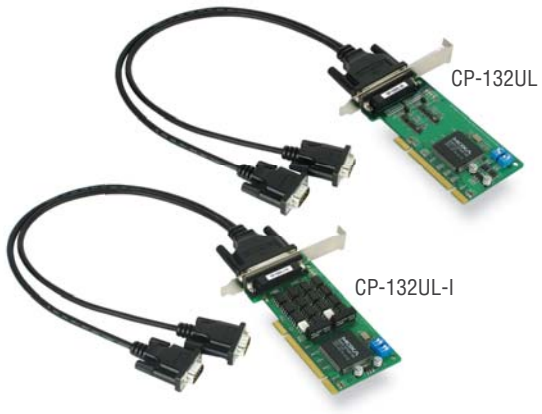
PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

DB9 male



CP-132UL/UL-I

2-port RS-422/485 Universal PCI serial boards with optional 2 KV isolation



- Over 800 Kbps data throughput for top performance
- 921.6 Kbps maximum baudrate for super fast data transmission
- ADDC® provides automatic data direction control for RS-485 signals
- Transmit data up to 1.2 km with RS-422/485
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5V PCI and PCI-X
- Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7
- 15 KV ESD protection on the board
- MD1 low profile form factor fits small-sized PCs
- Wide temperature model available for -40 to 85°C environments

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CP-132UL and CP-132UL-I are 2-port Universal PCI boards designed for industrial automation applications that require a long distance, multi-point, PC-based data acquisition solution.

On-chip Automatic Data Direction Control for precision RS-485 communication

RS-485 communication requires precise timing control to enable and disable the line driver. The Moxa Turbo Serial Engine™ chip that powers the CP-132UL/UL-I boards comes with on-chip ADDC®, which makes RS-485 as easy to use as RS-232.

RS-485 multidrop for up to 31 devices within 1.2 km

The CP-132UL/UL-I Universal PCI boards have 2 RS-422/485 serial ports, each of which can achieve data rates up to 921.6 Kbps. In RS-485 mode, the boards can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. For long distance RS-485 communication, choose the CP-132UL-I model, which comes with 2 KV optical isolation protection to prevent equipment damage.

Top Serial Performance

Moxa's 20-plus years of experience in serial board design is now concentrated in a new high performance serial data transmission chip. The Turbo Serial Engine™ chip provides serial boards with a 128-byte FIFO, on-chip hardware and software flow control, and burst data mode. Thanks to the Turbo Serial Engine™, Moxa is able to offer the world's best performing smart serial boards.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-132UL/UL-I boards are no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB25 female

Serial Interface

Number of Ports: 2
Serial Standards: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board
Optical Isolation: 2 KV (CP-132UL-I only)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals

RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND

RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND

RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7

Physical Characteristics

Dimensions: 64.5 x 120 mm (2.53 x 4.72 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B

EMS: EN55022, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

Power Requirements

Power Consumption:
CP-132UL: 120 mA @ +5 V
CP-132UL-I: 490 mA @ +5 V

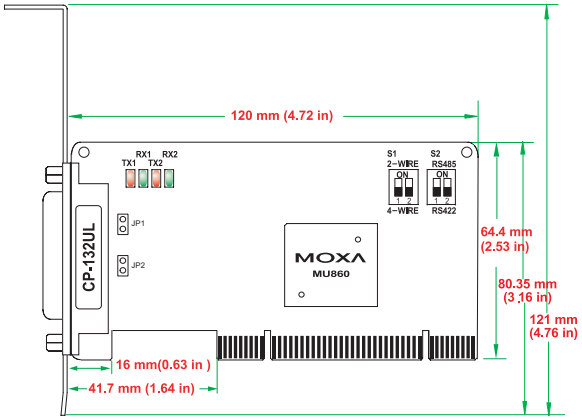
Warranty

Warranty Period: 5 years

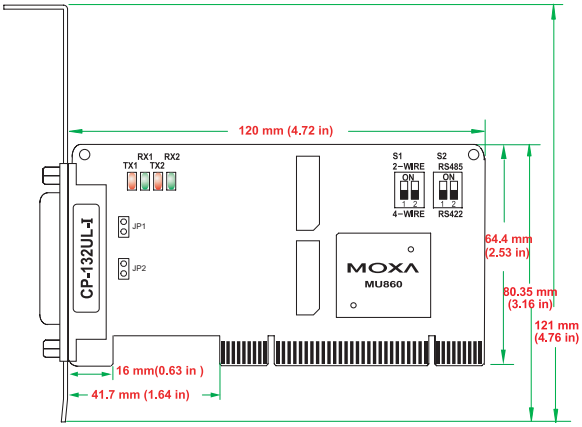
Details: See www.moxa.com/warranty

Dimensions

CP-132UL



CP-132UL-I



Ordering Information

Available Models

CP-132UL-DB9M: 2-port RS-422/485 low profile Universal PCI serial board, 0 to 55°C operating temperature (includes DB9 male cable)

CP-132UL-I-DB9M: 2-port RS-422/485 low profile Universal PCI serial board with optical isolation, 0 to 55°C operating temperature (includes DB9 male cable)

CP-132UL-T: 2-port RS-422/485 low profile Universal PCI serial board, -40°C to 85 operating temperature

CP-132UL-I-T: 2-port RS-422/485 low profile Universal PCI serial board with optical isolation, -40°C to 85 operating temperature

Package Checklist

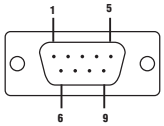
- CP-132UL or CP-132UL-I board
- Low profile bracket
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Connection Options (can be purchased separately)

CBL-M25M9x2-50
DB25 male to DB9 male x 2 (50 cm cable)

PIN	RS-422	RS-485-4w	RS-485-2w
1	TxD-(A)	TxD-(A)	---
2	TxD+(B)	TxD+(B)	---
3	RxD+(B)	RxD+(B)	Data+(B)
4	RxD-(A)	RxD-(A)	Data-(A)
5	GND	GND	GND
6	---	---	---
7	---	---	---
8	---	---	---
9	---	---	---

DB9 male



POS-104UL

4-port RS-232 Universal PCI board with power over serial

- Over 800 Kbps data throughput, for top performance
- Power options for each port: 5V (output), 12V (output), RI (input)
- Serial port power from bus or power supply
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5V PCI and PCI-X
- Low profile board, suitable for compact-sized PCs
- Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows XP Embedded, Windows CE 5.0/6.0, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO OpenServer 5/6, UnixWare 7
- 15 KV ESD protection on the board
- Wide temperature model available for -40 to 85°C environments

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The POS-104UL is a smart, 4-port Universal PCI serial board designed for POS and ATM applications and for use by industrial automation system manufacturers and system integrators. The POS-104UL is compatible with all major operating systems. In addition, each of the board's 4 RS-232 serial ports supports data rates up to 921.6 Kbps, and provides full modem control signals to ensure compatibility with a wide range of serial peripherals. The POS-104UL supplies 5 or 12 volts of power from each serial port, and works with both 3.3V and 5V PCI buses, making it suitable for installation in most PC servers.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB44 female

Serial Interface

Number of Ports: 4
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND, RI (optional)

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64, 9X/ME/NT), Windows XP Embedded, Windows CE 5.0/6.0, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO OpenServer 5/6, UnixWare 7

Physical Characteristics

Dimensions: 64.4 x 120 mm (2.53 x 4.72 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B
EMS: EN55022, EN61000-6-2, EN61000-6-4, EN61000-3-2, EN61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

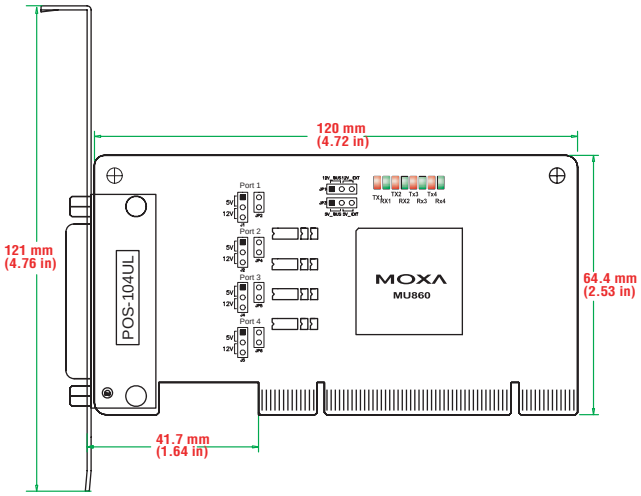
Power Requirements

Power Consumption: 145 mA @ +5 V
Power Output (per port): 1 A @ 5 V, 1 A @ 12 V

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Available Models

POS-104UL-DB9: 4-port RS-232 low profile Universal PCI board with serial port power, 0 to 55°C operating temperature (DB9 male cable included)

POS-104UL-T: 4-port RS-232 low profile Universal PCI board with serial port power, -40 to 85°C operating temperature

Package Checklist

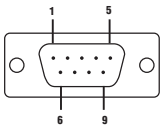
- POS-104UL board
- Low profile bracket
- DB9 male cable (POS-104UL-DB9 only)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Connection Options (can be purchased separately)

CBL-M44M9x4-50 (POS)

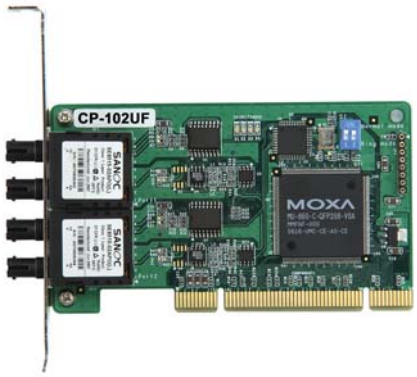
PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	5V/12V/RI

DB9 male



CP-102UF Series

2-port Universal PCI serial over fiber boards



- Extend serial transmission distance up to:
  - 40 km with single-mode (CP-102UF-S-ST)
  - 5 km with multi-mode (CP-102UF-M-ST)
- Supports "Ring" and "Point-to-Point" transmission modes
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5V PCI and PCI-X
- Drivers provided for Windows (2000, XP/2003/Vista/2008 x86/x64), Windows XP Embedded, Windows CE 5.0/6.0, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 6, SCO OpenServer 5/6, UnixWare 7
- Easy maintenance with on-board LED display and management software
- Immune from signal interference
- Guards against electronic degradation and chemical corrosion
- Wide temperature model available for -40 to 85°C environments

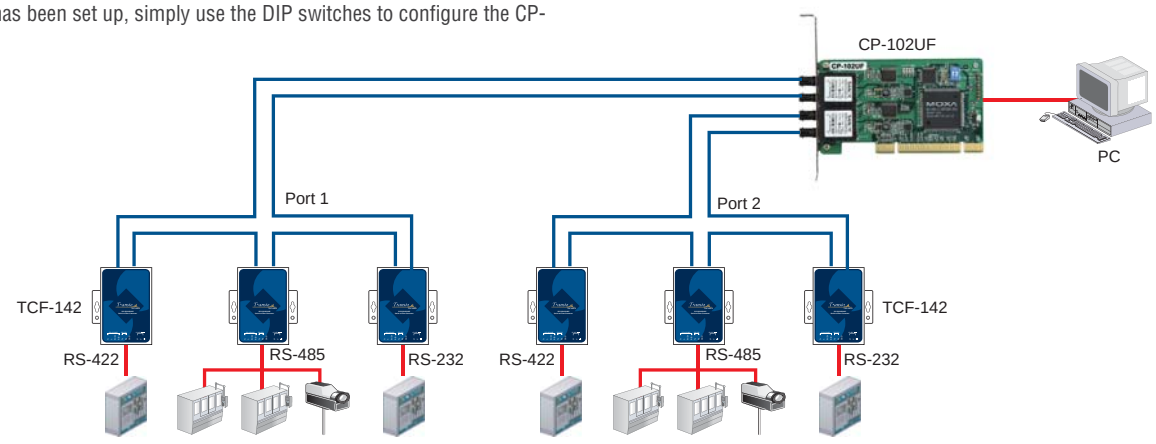
The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CP-102UF Universal PCI boards are designed for industrial automation applications that require a long distance, multi-point, PC-based data acquisition solution. The boards are compatible with all popular operating systems, and each of the 2 serial ports support data rates up to 921.6 Kbps. In addition, the CP-102UF boards work with both 3.3V and 5V PCI buses, allowing them to be installed in virtually any available PC server. With a maximum data transmission distance of 40 km (with the single-mode model), the CP-102UF cards beat the 15 meter maximum for RS-232, and even the 1.2 km maximum for RS-422/485. For many industrial applications, an even bigger benefit is that optical fiber isolates the data from dangerous increases in ground potential, ground loops, and electrical EMI/RFI electromagnetic radiation.

Ring Operation

With the CP-102UF board, your PC can be included as one node of a fiber ring formed using Moxa's own TCF-142 serial-to-fiber converter. Since each TCF-142 has two fiber ports and one serial port, PCs that are part of the ring will be able to communicate with all serial devices connected to the ring. Note that the Tx port of the CP-102UF connects to a neighboring converter's Rx port to form the ring. Once the ring has been set up, simply use the DIP switches to configure the CP-102UF to "Ring mode." When one node transmits a signal, the signal travels around the ring until it returns back to the transmitting unit, which then blocks the signals. With the CP-102UF, you can set up fiber rings that are up to 100 km in total length.



Specifications

Hardware

Bus: 32-bit Universal PCI

Number of Ports: 2

Max. Number of Boards per PC: 4

Optical Fiber Interface

Mode:
CP-102UF-M: Multi-mode
CP-102UF-S: Single-mode

Fiber Connectors: ST type

Cable Requirements:
CP-102UF-M: 50/125, 62.5/125, or 100/140 µm
CP-102UF-S: 8.3/125, 8.75/125, 9/125 or 10/140 µm

Transmission Distance:
CP-102UF-M: Up to 5 km with multi-mode fiber
CP-102UF-S: Up to 40 km with single-mode fiber

Wavelength:
CP-102UF-M: 820 nm
CP-102UF-S: 1310 nm

Tx Output: -5 dBm

Rx Sensitivity:
CP-102UF-M: -20 dBm
CP-102UF-S: -24 dBm

Point-to-Point Transmission: Half or full duplex

Ring Transmission: Half duplex

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: XON/XOFF

I/O Address: Assigned by BIOS

IRQ: Assigned by BIOS

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64), Windows XP Embedded, Windows CE 5.0/6.0, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 6, SCO OpenServer 5/6, UnixWare 7

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B

EMS: EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

Power Requirements

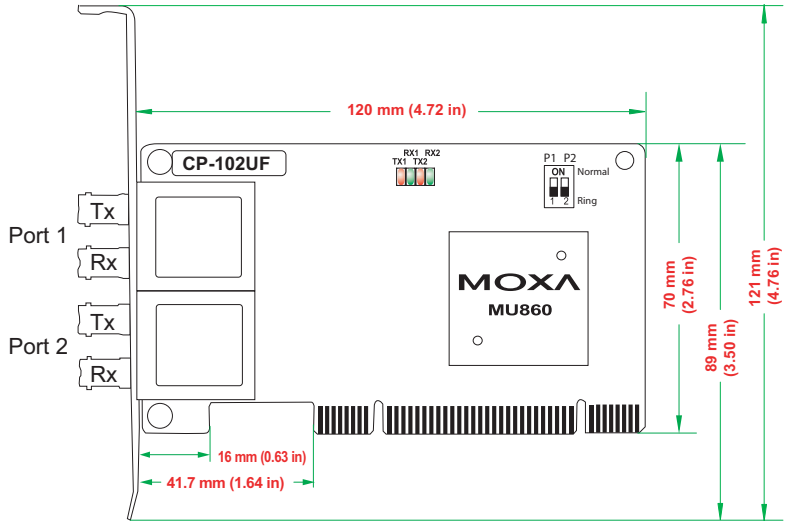
Power Consumption:
CP-102UF-M: 429 mA @ +5V
CP-102UF-S: 424 mA @ +5V

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Available Models

CP-102UF-M-ST: 2-port Universal PCI serial over fiber board with multi-mode fiber for 5 km transmission (ST connector), 0 to 55°C operating temperature

CP-102UF-S-ST: 2-port Universal PCI serial over fiber board with single-mode fiber for 40 km transmission (ST connector), 0 to 55°C operating temperature

CP-102UF-M-ST-T: 2-port Universal PCI serial over fiber board with multi-mode fiber for 5 km transmission (ST connector), -40 to 85°C operating temperature

CP-102UF-S-ST-T: 2-port Universal PCI serial over fiber board with single-mode fiber for 40 km transmission (ST connector), -40 to 85°C operating temperature

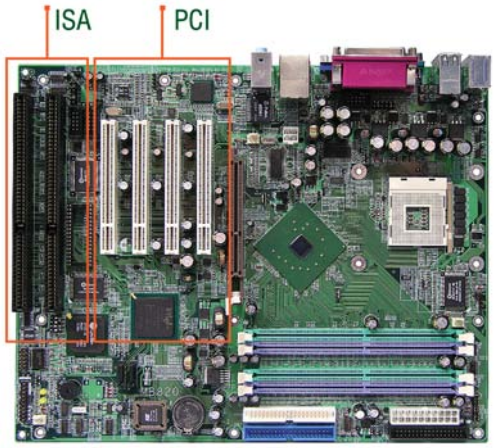
Package Checklist

- CP-102UF-M-ST or CP-102UF-S-ST board
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Introduction to ISA

ISA, which stands for Industry Standard Architecture, is one of the original standards for PC serial boards. The original interface was developed in the early 1980s to run at an 8 Mhz speed. ISA cards were required to transmit data between the motherboard and peripheral devices in 16-bit chunks.

Since ISA boards run much more slowly than PCI boards, people buying new serial boards or designing new systems will undoubtedly choose PCI. However, many systems in use today still have ISA slots, and a wide range of ISA peripherals, such as LAN cards and sound cards, are still available on the market.



Features of Moxa's ISA Boards

Moxa's ISA boards are smart, multiport serial I/O solutions that are used for connecting terminals, modems, printers, data acquisition equipment, and other serial devices to a PC. Both 4-port and 8-port ISA boards are available. One of the most attractive features of Moxa's ISA boards are the device drivers, which are fine-tuned to make full use of the 16-byte Tx/Rx FIFO and on-chip H/W flow control. The boards can transfer data without data loss even at speeds as high as 921.6 Kbps. Moxa's ISA boards offer a reliable and high performance solution for multiport communication applications.

Moxa's ISA boards are equipped with a custom-designed ASIC chip that combines several chips into one and results in a board that's half the size of other ISA boards. The entire family of Moxa ISA boards supports a 16-bit architecture, and a full range of I/O addresses and IRQs are available. In addition, due to the on-board EEPROM that is used for storing configuration data, the boards do not need jumpers or DIP switches. The ports on Moxa's ISA boards run independent of each other, making the boards compatible with most existing multiport boards.

Moxa's ISA Boards are Ideal for POS and Hospitality Applications

Moxa's ISA boards are used by many of the world's top companies as part of POS (Point-Of-Sale) or POS-related systems. Moxa's products are highly successful and continue to be selected in large numbers by providers of POS systems.

A prime example is Delta Airlines, which uses more than 10,000 of Moxa's C168H ISA boards as part of its flight schedule display system. In addition, IBM uses thousands of Moxa's C168H ISA boards as part of their advanced MMS (Multi-Media Station) e-commerce technology that provides information about a location as well as other sales services.

Typical POS system applications are PC-based POS cash registers, PC-based kiosk machines, PC-based lottery machines, PC-based ticket vending machines, as well as any other self-service machine connection. Since POS machines are placed at many different locations, POS system providers demand a highly reliable solution to avoid maintenance problems. Furthermore, since a large number of multiport boards are usually needed for POS projects, POS system providers are also very concerned about cost. This means that reliability and competitive price are the two key factors that POS customers consider. Moxa's ISA boards are specially designed for these POS applications, and meet customers' many needs and concerns.

Drivers are provided for use with operating systems such as Windows NT, 2000, XP, and 2003. The boards are low cost, but provide high performance, and outrank similar products from all other major multiport serial product manufactures.

C168H/HS

8-port RS-232 ISA serial boards

- Compact ISA boards with 8 RS-232 ports
- 921.6 Kbps maximum baudrate for super fast data transmission
- 16-byte FIFO and on-chip H/W flow control
- Choose from a wide range of connection cables and boxes
- Drivers provided for Windows (2000/XP/2003/Vista/2008, 9X/ME/NT), Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 4/6, FreeBSD 4/5, SCO OpenServer 5/6, UnixWare 7
- Easy configuration without switches or jumpers

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The 8-port C168H/HS ISA boards offer users a basic, high performance multiport serial communication solution for connecting terminals, modems, printers, data acquisition equipment, and other serial devices to a PC. The boards are a top choice of industrial automation engineers and system integrators, and support many different operating systems, including Windows, Linux, and even Unix. In addition, each of the boards' 8 RS-232 ports support a super fast 921.6 Kbps baudrate.

Specifications

Hardware

Comm. Controller: 16C550C or compatible x 8
Bus: 16-bit ISA
Connector: DB62 female

Serial Interface

Serial Standards: RS-232
Number of Ports: 8
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 25 KV on the board (C168HS only)
Optical Isolation: 500 V with connector Opt8F (must be purchased separately)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: 0x0000-0xFFFF (default = 0x180)
IRQ: 2 (9), 3, 4, 5, 7, 10 (default), 11, 12, 15

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support

Operating Systems: Windows (2000/XP/2003/Vista/2008, 9X/ME/NT), Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 4/6, FreeBSD 4/5, SCO OpenServer 5/6, UnixWare 7

Physical Characteristics

Dimensions: 93 x 157 mm (3.66 x 6.18 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class A
EMS: EN55022, EN61000-4-2, EN61000-4-3, EN61000-4-4, ENV50204

Power Requirements

Power Consumption: 170 mA max. @ +5 V, 100 mA max. @ +12 V, 60 mA max. @ -12 V

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

C168H: 8-port RS-232 ISA serial board
C168HS: 8-port RS-232 ISA serial board with surge protection

Connection Options (can be purchased separately)

Choose from a wide selection of cables and boxes: See page 10-41 for details

Package Checklist

- C168H or C168HS board
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

C104H/HS

4-port RS-232 ISA serial boards

- Economical, compact ISA boards with 4 RS-232 ports
- 921.6 Kbps maximum baudrate for super fast data transmission
- 16-byte FIFO and on-chip H/W, S/W flow control
- Drivers provided for Windows (2000/XP/2003/Vista/2008, 9X/ME/NT, 3.x), Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 4/6, FreeBSD 4/5, SCO OpenServer 5/6, UnixWare 7
- Easy configuration without switches or jumpers

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The 4-port C104H/HS ISA boards offer users an economical, high performance multiport serial communication solution for connecting terminals, modems, printers, data acquisition equipment, and other serial devices to a PC. The boards are a top choice of industrial automation engineers and system integrators, and support many different operating systems, including Windows, Linux, and even Unix. In addition, each of the boards' 4 RS-232 ports supports a super fast 921.6 Kbps baudrate.

Specifications

Hardware

Comm. Controller: 16C550C or compatible x 4
Bus: 16-bit ISA
Connector: DB37 female

Serial Interface

Serial Standards: RS-232
Number of Ports: 4
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 25 KV on the board (C104HS only)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: 0x0000-0xFFFF (default = 0x180)
IRQ: 2 (9), 3, 4, 5, 7, 10 (default), 11, 12, 15

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support

Operating Systems: Windows (2000/XP/2003/Vista/2008, 9X/ME/NT, 3.x), Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 4/6, FreeBSD 4/5, SCO OpenServer 5/6, UnixWare 7

Physical Characteristics

Dimensions: 83 x 157 mm (3.27 x 6.18 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class A
EMS: EN55022, EN61000-4-2, EN61000-4-3, EN61000-4-4, ENV50204

Power Requirements

Power Consumption: 100 mA max. @ +5 V, 100 mA max. @ +12 V, 60 mA max. @ -12 V

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

C104H: 4-port RS-232 ISA serial board
C104H-DB9M: 4-port RS-232 ISA serial board (includes DB9 male cable)
C104H-DB25M: 4-port RS-232 ISA serial board (includes DB25 male cable)
C104HS: 4-port RS-232 ISA serial board with surge protection
C104HS-DB9M: 4-port RS-232 ISA serial board with surge protection (includes DB9 male cable)
C104HS-DB25M: 4-port RS-232 ISA serial board with surge protection (includes DB25 male cable)

Connection Options (one cable is included with each board)

CBL-M37M9x4-30: DB37 male to DB9 male x 4 connection cable, 30 cm
CBL-M37M25x4-30: DB37 male to DB25 male x 4 connection cable, 30 cm

Package Checklist

- C104H or C104HS board
- DB9 male or DB25 male connection cable
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

CI-134 Series

4-port RS-422/485 ISA serial boards

- Economical ISA boards with 4 RS-422/485 ports
- RS-485 data direction control with ADDC® or by RTS
- 921.6 Kbps maximum baudrate for super fast data transmission
- 16-byte FIFO and on-chip hardware flow control
- Surge protection and optical isolation available
- Built-in termination resistors

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CI-134 series ISA boards come with 4 independent RS-422/485 serial ports for connecting data acquisition equipment and other serial devices to a PC. Connect your devices over longer distances—up to 1.2 km (4000 ft)—and ensure greater reliability in industrial environments with on-board surge protection and optical isolation (available with some models). Enjoy greater versatility by using point-to-point full duplex connections, or set up a half duplex RS-485 multi-drop network.

Specifications

Hardware

Comm. Controller: 16C550C or compatible x 4
Bus: 16-bit ISA
Connector: DB37 female

Serial Interface

Serial Standards: RS-422/485
Number of Ports: 4
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 25 KV on the board (CI-134IS only)
Optical Isolation: 2 KV (CI-134I/IS only)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: 0x0000-0xFFFF (default = 0x180)
IRQ: 2 (9), 3, 4, 5, 7, 10 (default), 11, 12, 15

Serial Signals

RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), RTS+(B), RTS-(A), CTS+(B), CTS-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows (2000/XP/2003/Vista/2008, 9X/ME/NT, 3.x), Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), SCO Open Server 5/6, UnixWare 7, QNX 4/6, FreeBSD 4/5

Physical Characteristics

Dimensions:
CI-134: 85 x 160 mm (3.35 x 6.30 in)
CI-134I/IS: 110 x 180 mm (4.33 x 7.09 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B
EMS: EN55022, EN61000-4-2, EN61000-4-3, EN61000-4-4, ENV50204

Power Requirements

Power Consumption:
CI-134: 450 mA max. @ +5 V
CI-134I: 610 mA max. @ +5 V
CI-134IS: 620 mA max. @ +5 V

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

CI-134-DB9M: 4-port RS-422/485 ISA serial board (includes DB9 male cable)
CI-134I-DB9M: 4-port RS-422/485 ISA serial board with optical isolation (includes DB9 male cable)
CI-134IS-DB9M: 4-port RS-422/485 ISA serial board with optical isolation and surge protection (includes DB9 male cable)

Connection Options (one cable is included with each board)

CBL-M37M9x4-30: DB37 male to DB9 male x 4 connection cable, 30 cm
CBL-M37M25x4-30: DB37 male to DB25 male x 4 connection cable, 30 cm

Package Checklist

- CI-134 series board
- DB9 male or DB25 male connection cable
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

CI-132 Series

2-port RS-422/485 ISA serial boards

- Economical RS-422/485 ISA boards with 2 DB9 male connectors on the board for easy wiring
- RS-485 data direction control with ADDC® or by RTS
- 921.6 Kbps maximum baudrate for super fast data transmission
- 16-byte FIFO and on-chip hardware flow control
- Surge protection and optical isolation available
- Built-in termination resistors

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CI-132 series ISA boards come with 2 independent RS-422/485 serial ports for connecting data acquisition equipment and other serial devices to a PC. Connect your devices over longer distances—up to 1.2 km (4000 ft)—and ensure greater reliability in industrial environments with on-board surge protection and optical isolation (available with some models). Enjoy greater versatility by using point-to-point full duplex connections, or set up a half duplex RS-485 multi-drop network.

Specifications

Hardware

Comm. Controller: 16C550C or compatible x 2
Bus: 16-bit ISA
Connector: DB9 male x 2

Serial Interface

Serial: RS-422/485
Number of Ports: 2
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 25 KV on the board (CI-132IS only)
Optical Isolation: 2 KV (CI-132I/IS only)

Performance

Baudrate: 50 bps to 921.6 Kbps
Built-in Termination Resistor: 120 ohm (enabled by jumper for RS-485-2w)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: 0x0000-0xFFFF (default = 0x180)
IRQ: 2 (9), 3, 4, 5, 7, 10 (default), 11, 12, 15

Serial Signals

RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), RTS+(B), RTS-(A), CTS+(B), CTS-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Control: ADDC® (automatic data direction control), or by RTS

Driver Support

Operating Systems: Windows (2000/XP/2003/Vista/2008, 9X/ME/NT), Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 4/6, FreeBSD 4/5, SCO OpenServer 5/6, UnixWare 7

Physical Characteristics

Dimensions:
CI-132: 75 x 157 mm (2.95 x 6.18 in)
CI-132I/IS: 105 x 157 mm (4.13 x 6.18 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 85°C (-4 to 185°F)

Regulatory Approvals

FCC: Part 15 Class B
EMS: EN55022, EN61000-4-2, EN61000-4-3, EN61000-4-4, ENV50204

Power Requirements

Power Consumption:
CI-132: 240 mA max. @ +5 V
CI-132I/IS: 620 mA max. @ +5 V

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

CI-132: 2-port RS-422/485 ISA serial board
CI-132I: 2-port RS-422/485 ISA serial board with optical isolation
CI-132IS: 2-port RS-422/485 ISA serial board with optical isolation and surge protection

Package Checklist

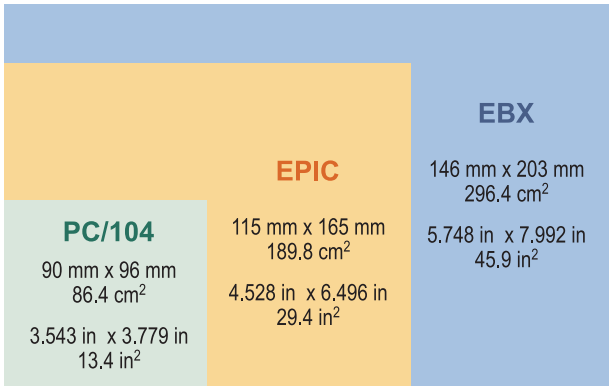
- CI-132 series board
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Introduction to PC/104 and PC/104-*Plus*

Using the PC and PC/AT architectures for both desktop and non-desktop applications is now well established, but using these architectures for embedded microcomputer applications was slow to take hold. The reason is that PC and PC/AT motherboards, as well as the accompanying expansion cards, are too large to be used with embedded applications.

This is where PC/104 comes in. The PC/104 architecture differs from the P996 standard in the following ways:

- Reduced form factor: 90 x 96 mm (3.543 x 3.779 in)
- Self-stacking bus that eliminates the need for backplanes or card cages
- Reduced bus drive power required for most signals (up to 4 mA), allowing fewer components and lower power consumption (typically just 1-2 watts per module)

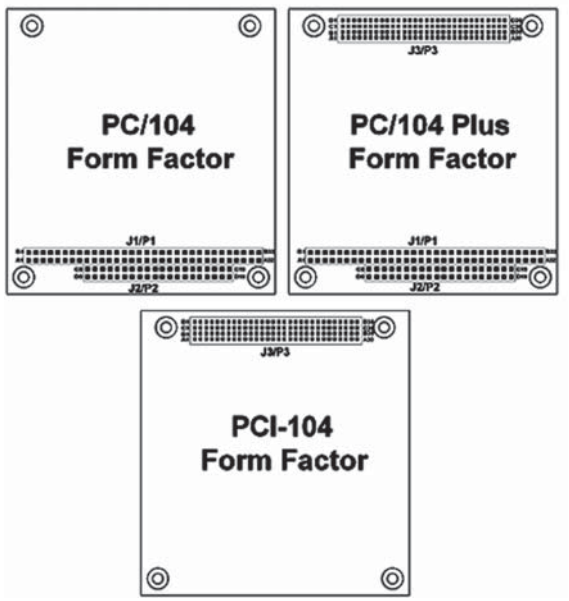


The three major form factors for embedded single-board computers.

Differences between PC/104, PC/104-Plus, and PCI-104

The ISA bus architecture has been a popular choice for embedded applications for a long time, and the publication of the PC/104 standard in 1992 made the ISA bus architecture available in a small, rugged form factor. Since that time, PC/104 has become an industry standard. As technological requirements advanced, a need arose for a higher bus throughput performance. This was especially true for graphics devices and other high-speed I/O devices such as networks. The PC/104 Consortium met this challenge by incorporating a PCI bus into the PC/104 form factor. This new standard has become known as PC/104-Plus. The architecture provides a link for versatile legacy hardware, and meets the high-speed requirements for both present and future hardware.

(This content is based on information from the PC/104 Org website.)



PC/104:

The PC/104 standard specifies the mechanical and electrical specifications for a compact version of the ISA (PC and PC/AT) bus, but optimized for the unique requirements of embedded systems applications. The specification referred to here as "PC/104" is based on the 104 signal contacts on the two bus connectors (64 pins on P1, plus 40 pins on P2).

PC/104-*Plus*:

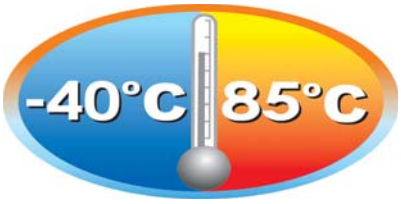
To accommodate the gradual replacement of ISA bus devices with PCI devices, the PC/104-Plus standard was approved by the PC/104 Consortium. The PC/104-Plus connector supports both ISA and PCI buses to accommodate PCI devices in small form factor embedded computers.

PCI-104:

To accommodate the gradual replacement of ISA bus devices with PCI devices, the PCI-104 standard was approved by the PC/104 Consortium. PCI-104 is a PCI-only architecture that accommodates the advances of PCI devices in a small rugged form factor.

Features of Moxa's PC/104 and PC-104-*Plus* Modules

Wide temperature for industrial applications



Industrial PCs were designed to work reliably in harsh industrial environments, and of all the features that distinguish industrial products from their commercial-grade cousins, the "wide temperature" feature is considered the most important.

Most industrial PCs now support a temperature range of -40 to 85°C. For this reason, Moxa's PC/104 and PC/104-Plus modules also support an operating temperature range of -40 to 85°C, making Moxa a leading provider of hardware for embedded systems.

Support for Windows CE 5.0 and Windows XP Embedded

Moxa's PC/104 and PC/104-Plus modules support a variety of operating systems that are used for industrial applications, including Windows CE 5.0 and Windows XP Embedded.

PC/104 Stack is Designed for Added Ruggedness

The PC/104 embedded computer standard is defined by the PC/104 Consortium, which has specified both the form factor and characteristics of the computer bus. The standard was created specifically to meet the special conditions encountered by many embedded computing applications, which require reliable data transfer in harsh, industrial-type environments.

The PC/104 stack design is one of the most recognizable differences between the PC/104 standard and PCI standard, which is the most common standard used by PCs. Not requiring a backplane, and allowing the PC/104 boards to be stacked one on top of the other solves two major problems: several PC/104 expansion cards can be added easily to the same embedded motherboard, and the resulting structure is more stable, making it suitable for rugged environments. Stacking is achieved by using the mounting-holes in the corners of each module.

PC/104 is Designed for Embedded Applications

The PC/104 standard was developed for embedded applications, which require a smaller, more robust board. Since the main difference with standard expansion boards is size, designers can use existing software resources to reduce the time to market of their embedded applications.

Applications

- KIOSKs
- Vending Machines
- Instruments
- Military Equipment
- Testing Equipment
- ATMs
- POS Devices
- Industrial Control Systems

Moxa's PC/104 Module Solution

Moxa's PC/104 serial modules meet the embedded PC standard, and work with PC/104 CPU boards that accept the PC/104 expansion interface. Moxa's PC/104 modules come with 2 to 8 serial ports, built-in 15 KV ESD protection, optional 2 KV optical isolation protection, and optional DB9 or DB25 connection cables to satisfy a variety of connection requirements.

Serial Interfae	No. of Ports	Moxa's PC/104 Models	Moxa's PC/104-Plus Models
RS-232	4	CA-104	---
	8	CA-108	CB-108
RS-422/485	2	CA-132/132I	---
	4	CA-134I	CB-134I
RS-232/422/485	4	CA-114	CB-114

CA-108 Series

8-port RS-232 PC/104 modules

- 921.6 Kbps maximum baudrate for super fast data transmission
- On-chip H/W and S/W flow control
- Built-in 15 KV ESD protection
- IRQ and I/O settings are jumper and DIP switch selectable
- Onboard Tx and Rx LED indicators for each port
- Windows CE 5.0/6.0 and Windows XP embedded operating systems supported
- Wide temperature model available for -40 to 85°C environments

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CA-108 PC/104 modules are reliable, high performance, multiport serial communication solutions that have 8 RS-232 ports, and can be used with PC/104 CPU boards that accept the PC/104 expansion interface. Optional DB9 and DB25 connection cables are available for connecting to serial devices, and the CA-108s' versatile driver support makes the modules suitable for a wide range of applications.

Specifications

Hardware

Comm. Controller: 16C550C or compatible x 8
Bus: PC/104 bus
Connector: 40-pin box header
DIP Switches: I/O base address, interrupt vector

Serial Interface

Number of Ports: 8
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
IRQ: 3, 4, 5, 6, 7, 9, 10, 11, 12, 15 (shared for all ports)
FIFO: 64 bytes

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support

Operating Systems: Windows (2000/XP/2003/Vista), Windows 9X/ME/NT, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 4/6

Physical Characteristics

Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -40 to 55°C (-40 to 131°F)

Regulatory Approvals

FCC: Part 15 Class A
EMS: EN55022, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

CA-108: 8-port RS-232 PC/104 module, 0 to 55°C operating temperature
CA-108-T: 8-port RS-232 PC/104 module, -40 to 85°C operating temperature

Connection Options (can be purchased separately)

CBL-F40M9x4-50: 40-pin box header to DB9 male x 4 connection cable, 50 cm
CBL-F40M25x4-50: 40-pin box header to DB25 male x 4 connection cable, 50 cm

Package Checklist

- CA-108 or CA-108-T module
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

CA-114 Series

4-port RS-232/422/485 PC/104 modules

- 921.6 Kbps maximum baudrate for super fast data transmission
- On-chip H/W and S/W flow control
- Built-in 15 KV ESD protection
- IRQ settings, I/O settings, and serial interface are jumper and DIP switch selectable
- Onboard Tx and Rx LED indicators for each port
- Windows CE 5.0/6.0 and Windows XP embedded operating systems supported
- Wide temperature model available for -40 to 85°C environments

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CA-114 PC/104 modules are reliable, high performance, multiport serial communication solutions that have 4 RS-232/422/485 ports, and can be used with PC/104 CPU boards that accept the PC/104 expansion interface. Optional DB9 and DB25 connection cables are available for connecting to serial devices, and the CA-114s' versatile driver support makes the modules suitable for a wide range of applications.

Specifications

Hardware

Comm. Controller: 16C550C or compatible x 4
Bus: PC/104 bus
Connector: 40-pin box header
DIP Switches: I/O base address, interrupt vector, serial interface

Serial Interface

Number of Ports: 4
Serial Standards: RS-232/422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
IRQ: 3, 4, 5, 6, 7, 9, 10, 11, 12, 15 (shared for all ports)
FIFO: 64 bytes

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows (2000/XP/2003/Vista), Windows 9X/ME/NT, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 4/6

Physical Characteristics

Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -40 to 55°C (-40 to 131°F)

Regulatory Approvals

FCC: Part 15 Class A
EMS: EN55022, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

CA-114: 4-port RS-232/422/485 PC/104 module, 0 to 55°C operating temperature
CA-114-T: 4-port RS-232/422/485 PC/104 module, -40 to 85°C operating temperature

Connection Options (can be purchased separately)

CBL-F40M9x4-50: 40-pin box header to DB9 male x 4 connection cable, 50 cm
CBL-F40M25x4-50: 40-pin box header to DB25 male x 4 connection cable, 50 cm

Package Checklist

- CA-114 or CA-114-T module
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

CA-134I Series

4-port RS-422/485 PC/104 modules with 2 KV isolation

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

- 921.6 Kbps maximum baudrate for super fast data transmission
- On-chip H/W and S/W flow control
- Built-in 15 KV ESD protection
- IRQ settings, I/O settings, and serial interface are jumper and DIP switch selectable
- Onboard Tx and Rx LED indicators for each port
- Windows CE 5.0/6.0 and Windows XP embedded operating systems supported
- Wide temperature model available for -40 to 85°C environments

Overview

The CA-134I PC/104 modules are reliable, high performance, multiport serial communication solutions that have 4 RS-422/485 ports, and can be used with PC/104 CPU boards that accept the PC/104 expansion interface. Optional DB9 and DB25 connection cables are available for connecting to serial devices, and the CA-134Is' versatile driver support makes the modules suitable for a wide range of applications.

Specifications

Hardware

Comm. Controller: 16C550C or compatible x 4
Bus: PC/104 bus
Connector: 40-pin box header
DIP Switches: I/O base address, interrupt vector, serial interface

Serial Interface

Number of Ports: 4
Serial Standards: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board
Optical Isolation Protection: 2 KV

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
IRQ: 3, 4, 5, 6, 7, 9, 10, 11, 12, 15 (shared for all ports)
FIFO: 64 bytes

Serial Signals

RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows (2000/XP/2003/Vista), Windows 9X/ME/NT, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 4/6

Physical Characteristics

Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -40 to 55°C (-40 to 131°F)

Regulatory Approvals

FCC: Part 15 Class A
EMS: EN55022, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

CA-134I: 4-port RS-422/485 PC/104 module with optical isolation, 0 to 55°C operating temperature
CA-134I-T: 4-port RS-422/485 PC/104 module with optical isolation, -40 to 85°C operating temperature

Connection Options (can be purchased separately)

CBL-F40M9x4-50: 40-pin box header to DB9 male x 4 connection cable, 50 cm
CBL-F40M25x4-50: 40-pin box header to DB25 male x 4 connection cable, 50 cm

Package Checklist

- CA-134I or CA-134I-T module
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

CA-104 Series

4-port RS-232 PC/104 modules

- 921.6 Kbps maximum baudrate for super fast data transmission
- On-chip software flow control
- Built-in 15 KV ESD protection
- IRQ and I/O settings are jumper and DIP switch selectable
- Onboard Tx and Rx LED indicators for each port
- Windows CE 5.0/6.0 and Windows XP embedded operating systems supported
- Wide temperature model available for -40 to 85°C environments

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CA-104 PC/104 modules are reliable, high performance, multiport serial communication solutions that have 4 RS-232 ports, and can be used with PC/104 CPU boards that accept the PC/104 expansion interface. Optional DB9 and DB25 connection cables are available for connecting to serial devices, and the CA-104s' versatile driver support makes the modules suitable for a wide range of applications.

Specifications

Hardware

Comm. Controller: 16C550C or compatible x 4
Bus: PC/104 bus
Connector: 40-pin box header
DIP Switches: I/O base address, interrupt vector

Serial Interface

Number of Ports: 4
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
IRQ: 3, 4, 5, 6, 7, 9, 10, 11, 12, 15 (shared for all ports)
FIFO: 64 bytes

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support

Operating Systems: Windows (2000/XP/2003/Vista), Windows 9X/ME/NT, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 4/6

Physical Characteristics

Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -40 to 55°C (-40 to 131°F)

Regulatory Approvals

FCC: Part 15 Class A
EMS: EN55022, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

Power Requirements

Power Consumption: 210 mA @ +5 V

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

CA-104: 4-port RS-232 PC/104 module, 0 to 55°C operating temperature
CA-104-T: 4-port RS-232 PC/104 module, -40 to 85°C operating temperature

Connection Options (can be purchased separately)

CBL-F40M9x4-50: 40-pin box header to male DB9 x 4 connection cable, 50 cm
CBL-F40M25x4-50: 40-pin box header to DB25 male x 4 connection cable, 50 cm

Package Checklist

- CA-104 or CA-104-T module
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

CA-132/132I Series

2-port RS-422/485 PC/104 modules with optional 2 KV isolation

- 921.6 Kbps maximum baudrate for super fast data transmission
- On-chip software flow control
- Built-in 15 KV ESD protection
- IRQ, I/O, and serial interface jumper and DIP switch selectable
- Onboard Tx and Rx LED indicators for each port
- Supports RS-485 ADDC® (Automatic Data Direction Control)
- Windows CE 5.0/6.0 and Windows XP embedded operating systems supported
- Wide temperature models available for -40 to 85°C environments

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CA-132/132I PC/104 modules are reliable, high performance, multiport serial communication solutions that have 2 RS-422/485 ports, and can be used with PC/104 CPU boards that accept the PC/104 expansion interface. Optional DB9 and DB25 connection cables are available for connecting to serial devices, and the CA-132/132Is' versatile driver support makes the modules suitable for a wide range of applications.

Specifications

Hardware

Comm. Controller: 16C550C or compatible x 2
Bus: PC/104 bus
Connectors: 20-pin box header
LED Indicators: Built-in TX, RX LEDs for each port
DIP Switches: I/O base address, interrupt vector

Serial Interface

Number of Ports: 2
Serial Standards: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board
Optical Isolation: 2 KV (CA-132I only)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
IRQ: 3, 4, 5, 6, 7, 9, 10, 11, 12, 15 (shared for all ports)
FIFO: 64 bytes

Serial Signals

RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows (2000/XP/2003/Vista, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 4/6

Physical Characteristics

Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -40 to 55°C (-40 to 131°F)

Regulatory Approvals

FCC: Part 15 Class A
EMS: EN55022, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

Power Requirements

Power Consumption:
CA-132: 155 mA @ +5 V
CA-132I: 190 mA @ +5 V

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

CA-132: 2-port RS-422/485 PC/104 module, 0 to 55°C operating temperature
CA-132I: 2-port RS-422/485 PC/104 module with optical isolation protection, 0 to 55°C operating temperature
CA-132-T: 2-port RS-422/485 PC/104 module, -40 to 85°C operating temperature
CA-132I-T: 2-port RS-422/485 PC/104 module with optical isolation protection, -40 to 85°C operating temperature

Connection Options (can be purchased separately)

CBL-F20M9x2-50: 20-pin box header to DB9 male x 2 connection cable, 50 cm
CBL-F20M25x2-50: 20-pin box header to DB25 male x 2 connection cable, 50 cm

Package Checklist

- CA-132 or CA-132I module
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

CB-108 Series

8-port RS-232 PC/104-Plus modules

- 921.6 Kbps maximum baudrate for super fast data transmission
- On-chip H/W and S/W flow control
- Built-in 15 KV ESD protection
- Onboard Tx and Rx LED indicators for each port
- Windows CE 5.0/6.0 and Windows XP embedded operating systems supported
- Wide temperature model available for -40 to 85°C environments

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CB-108 PC/104-Plus modules come with 8 RS-232 ports, and can be used with PC/104-Plus CPU boards that accept the PC/104-Plus expansion interface. Optional DB9 and DB25 connection cables are available for connecting to serial devices, and the CB-108s' versatile driver support makes the modules suitable for a wide range of applications. The CB-108 modules can be used on the PC/104-Plus (PCI) bus, and provide a reliable, high performance solution for multiport serial communication.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: PC/104-Plus bus
Connector: 40-pin box header

Serial Interface

Number of Ports: 8
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS
FIFO: 128 bytes

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 6

Physical Characteristics

Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -40 to 55°C (-40 to 131°F)

Regulatory Approvals

FCC: Part 15 Class A
EMS: EN55022, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

CB-108: 8-port RS-232 PC/104-Plus module, 0 to 55°C operating temperature
CB-108-T: 8-port RS-232 PC/104-Plus module, -40 to 85°C operating temperature

Connection Options (can be purchased separately)

CBL-F40M9x4-50: 40-pin box header to DB9 male x 4 connection cable, 50 cm
CBL-F40M25x4-50: 40-pin box header to DB25 male x 4 connection cable, 50 cm

Package Checklist

- CB-108 or CB-108-T module
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

CB-114 Series

4-port RS-232/422/485 PC/104-Plus modules

- 921.6 Kbps maximum baudrate for super fast data transmission
- On-chip H/W and S/W flow control
- Built-in 15 KV ESD protection
- Serial interface is DIP switch selectable
- Onboard Tx and Rx LED indicators for each port
- Windows CE 5.0/6.0 and Windows XP embedded operating systems supported
- Wide temperature model available for -40 to 85°C environments

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CB-114 PC/104-Plus modules come with 4 RS-232/422/485 ports, and can be used with PC/104-Plus CPU boards that accept the PC/104-Plus expansion interface. Optional DB9 and DB25 connection cables are available for connecting to serial devices, and the CB-114s' versatile driver support makes the modules suitable for a wide range of applications. The CB-114 modules can be used on the PC/104-Plus (PCI) bus, and provide a reliable, high performance solution for multiport serial communication.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: PC/104-Plus bus
Connector: 40-pin box header
DIP Switches: Serial interface

Serial Interface

Number of Ports: 4
Serial Standards: RS-232/422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS
FIFO: 128 bytes

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 6

Physical Characteristics

Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -40 to 55°C (-40 to 131°F)

Regulatory Approvals

FCC: Part 15 Class A
EMS: EN55022, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

CB-114: 4-port RS-232/422/485 PC/104 module, 0 to 55°C operating temperature
CB-114-T: 4-port RS-232/422/485 PC/104 module, -40 to 85°C operating temperature

Connection Options (can be purchased separately)

CBL-F40M9x4-50: 40-pin box header to DB9 male x 4 connection cable, 50 cm
CBL-F40M25x4-50: 40-pin box header to DB25 male x 4 connection cable, 50 cm

Package Checklist

- CB-114 or CB-114-T module
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

CB-134I Series

4-port RS-422/485 PC/104-Plus modules with 2 KV isolation

- 921.6 Kbps maximum baudrate for super fast data transmission
- On-chip H/W and S/W flow control
- Built-in 15 KV ESD protection
- Serial interface is DIP switch selectable
- Onboard Tx and Rx LED indicators for each port
- Windows CE 5.0/6.0 and Windows XP embedded operating systems supported
- Wide temperature model available for -40 to 85°C environments

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The CB-134I PC/104-Plus modules come with 4 RS-422/485 ports, and can be used with PC/104-Plus CPU boards that accept the PC/104-Plus expansion interface. Optional DB9 and DB25 connection cables are available for connecting to serial devices, and the CB-134Is' versatile driver support makes the modules suitable for a wide range of applications. The CB-134I modules can be used on the PC/104-Plus (PCI) bus, and provide a reliable, high performance solution for multiport serial communication.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: PC/104-Plus bus
Connector: 40-pin box header
DIP Switches: Serial interface

Serial Interface

Number of Ports: 4
Serial Standards: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board
Optical Isolation: 2 KV

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS
FIFO: 128 bytes

Serial Signals

RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 6

Physical Characteristics

Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -40 to 55°C (-40 to 131°F)

Regulatory Approvals

FCC: Part 15 Class A
EMS: EN55022, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

CB-134I: 4-port RS-422/485 PC/104-Plus module with optical isolation protection, 0 to 55°C operating temperature
CB-134I-T: 4-port RS-422/485 PC/104-Plus module with optical isolation protection, -40 to 85°C operating temperature

Connection Options (can be purchased separately)

CBL-F40M9x4-50: 40-pin box header to DB9 male x 4 connection cable, 50 cm
CBL-F40M25x4-50: 40-pin box header to DB25 male x 4 connection cable, 50 cm

Package Checklist

- CB-134I or CB-134I-T module
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Industrial USB

Product Selection Guides

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USB-to-Serial Converters

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UPort™ 1150I 1-port USB-to-serial converter with 2 KV isolation. 11-13
UPort™ 1250/1250I 2-port USB-to-serial converters with optional 2 KV isolation. . . . 11-15
UPort™ 1400 Series 4-port USB-to-serial converters with optional 2 KV isolation . . . 11-17
UPort™ 1600-8 Series 8-port USB-to-serial converters 11-19
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UPort™ 2210/2410 2 and 4-port RS-232 USB-to-serial converters 11-23
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USB Hubs

UPort™ 404/407 4 and 7-port industrial-grade USB hubs. 11-27
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USB-to-Serial Converters

	UPort™ 1110	UPort™ 1130	UPort™ 1150	UPort™ 1150I	UPort™ 1250	UPort™ 1250I	UPort™ 1410	UPort™ 1450	UPort™ 1450I
USB Interface									
Compliance	USB 1.0/1.1 compliant, USB 2.0 compatible				USB 1.1/2.0 compliant				
Connector	USB type A			USB type B					
Speed	12 Mbps (Full-Speed USB)				480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)				
Serial Interface									
Number of Ports	1 x RS-232	1 x RS-422/485	1 x RS-232/422/485	1 x RS-232/422/485	2 x RS-232/422/485	2 x RS-232/422/485	4 x RS-232	4 x RS-232/422/485	4 x RS-232/422/485
Connector	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	Flow Control: RTS/CTS, XON/XOFF								
FIFO	64 bytes	64 bytes	64 bytes	64 bytes	128 bytes	128 bytes	128 bytes	128 bytes	128 bytes
Baudrate	50 bps to 921.6 Kbps								
Embedded ESD Protection	15 KV								
Optical Isolation	---	---	---	2 KV	---	2 KV	---	---	2 KV
Driver Support									
Windows 98/ME	√	√	√	√	---	---	---	---	---
Windows 2000	√	√	√	√	√	√	√	√	√
Windows XP/2003 x86/x64	√	√	√	√	√	√	√	√	√
Windows Vista x86/x64	√	√	√	√	√	√	√	√	√
Windows 2008 x86/x64	---	---	---	---	---	---	---	---	---
WinCE 5.0/6.0	√	√	√	√	√	√	√	√	√
Linux 2.4	√	√	√	√	√	√	√	√	√
Linux 2.6 x86/x64	√	√	√	√	√	√	√	√	√
Physical Characteristics									
Housing	ABS + PC			SECC sheet metal (1 mm), IP30 protection					
Product Weight	65 g			75 g	180 g		720 g		
Packaged Weight	200 g			370 g	370 g	680 g	1320 g		
Dimensions (mm)	38.4 x 60 x 20			52 x 80 x 22	77 x 26 x 111		204 x 30 x 125		
Environmental Limits									
Operating Temperature	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C
Regulatory Approvals									
EMI	FCC Part 15 Class B, EN61000-6-4				FCC, Part 15 Class A, EN61000-6-4				
Safety	---	---	---	---	UL, CUL, TÜV				
EMS	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11, EN61000-6-2				EN55022 Class A, EN55024, EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11, EN61000-6-2				
Power Requirements									
Power Consumption	30 mA @ 5 VDC	90 mA @ 5 VDC	77 mA @ 5 VDC	260 mA @ 5 VDC	360 mA @ 5 VDC	200 mA @ 12 VDC	290 mA @ 5 VDC	260 mA @ 12 VDC	360 mA @ 12 VDC
Reliabilty									
Warranty	5 years (see www.moxa.com/warranty)								

USB-to-Serial Converters

	UPort™ 1610-8	UPort™ 1650-8	UPort™ 1610-16	UPort™ 1650-16	UPort™ 2210	UPort™ 2410	UPort™ 2230	UPort™ 2430
USB Interface								
Compliance	USB 1.0/1.1/2.0 compliant				USB 1.1/2.0 compliant			
Connector	USB type B							
Speed	480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)							
Serial Interface								
Number of Ports	8 x RS-232	8 x RS-232/422/485	16 x RS-232	16 x RS-232/422/485	2 x RS-232	4 x RS-232	2 x RS-422/485	4 x RS-422/485
Connector	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark							
Flow Control	RTS/CTS, XON/XOFF							
FIFO	128 bytes	128 bytes	128 bytes	128 bytes	16 bytes	16 bytes	16 bytes	16 bytes
Baudrate	50 bps to 921.6 Kbps							
Embedded ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Optical Isolation	---	---	---	---	---	---	---	---
Driver Support								
Windows 98/ME	---	---	---	---	---	---	---	---
Windows 2000	√	√	√	√	√	√	√	√
Windows XP/2003 x86/x64	√	√	√	√	√	√	√	√
Windows Vista x86/x64	√	√	√	√	√	√	√	√
Windows 2008 x86/x64	---	---	---	---	√	√	√	√
WinCE 5.0/6.0	√	√	√	√	---	---	---	---
Linux 2.4	√	√	√	√	√	√	---	---
Linux 2.6 x86/x64	√	√	√	√	√	√	√	√
Physical Characteristics								
Housing	SECC sheet metal (1 mm), IP30 protection				Polycarbonate (PC)			
Product Weight	835 g	835 g	2475 g	2475 g	120 g	210 g	---	---
Packaged Weight	1440 g	1440 g	3440 g	3440 g	325 g	455 g	---	---
Dimensions (mm)	204 x 44 x 125	204 x 44 x 125	440 x 45.5 x 198.1	440 x 45.5 x 198.1	70 x 35 x 120	80 x 35 x 185	70 x 35 x 120	80 x 35 x 185
Environmental Limits								
Operating Temperature	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C
Regulatory Approvals								
EMI	FCC Part 15 Class A, EN61000-6-4				FCC Part 15 Class B, EN61000-6-4			
Safety	UL, CUL, TÜV				---			
EMS	EN55022 Class A, EN55024, EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11, EN61000-6-2				EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11, EN61000-6-2			
Power Requirements								
Power Consumption	230 mA @ 12 VDC	340 mA @ 12 VDC	130 mA @ 100 VAC	150 mA @ 100 VAC	140 mA @ 5 VDC	240 mA @ 5 VDC	---	---
Reliabilty								
Warranty	5 years (see www.moxa.com/warranty)							

USB Hubs

	UPort™ 404	UPort™ 407	UPort™ 404-T	UPort™ 407-T	UPort™ 204	UPort™ 207
USB Interface						
Compliance	USB 1.1/2.0 compliant					
Upstream USB Ports	1 (Type B)					
Downstream USB Ports	4 (Type A)	7 (Type A)	4 (Type A)	7 (Type A)	4 (Type A)	7 (Type A)
Speed	480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)					
Supply Current	500 mA max. per channel					
Physical Characteristics						
Housing	Aluminum				Polycarbonate (PC)	
Dimensions (mm)	80 x 35 x 130	100 x 35 x 192	80 x 35 x 130	100 x 35 x 192	80 x 35 x 130	100 x 35 x 195
Environmental Limits						
Operating Temperature	0 to 60°C	0 to 60°C	-40 to 85°C	-40 to 85°C	0 to 60°C	0 to 60°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 75°C	-20 to 75°C	-40 to 85°C	-40 to 85°C	-20 to 75°C	-20 to 75°C
Regulatory Approvals						
EMI	FCC, Part 15 Class A, EN61000-6-4					
Safety	UL508, LVD					
EMS	EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11, EN61000-6-2					
Power Requirements						
Power Consumption	1300 mA @ 12 VDC	2300 mA @ 12 VDC	1300 mA @ 12 VDC	2300 mA @ 12 VDC	1210 mA@ 12 VDC	2170 mA @ 12 VDC
Reliabilty						
Warranty	5 years (see www.moxa.com/warranty)					

CASE STUDY

Video Surveillance System

Cost-effective USB-to-serial converter for COM port expansion

The most basic video surveillance setup is a single camera connected directly to a monitor and recording device. However, many businesses require video surveillance on a larger scale, which requires a dedicated management system. These management systems cannot include every possible type of device port, so converters are needed to attach different devices.

USB connections have become a standard feature for computers and many networking devices. Video surveillance management systems generally run on host computers that are equipped with USB ports, but still need to be connected to monitoring devices through serial COM ports. The UPort™ 1150 offers cost-effective USB connectivity for serial devices, such as SpeedDome cameras, PTZ controllers, card readers, and POS boxes, over a large scale video surveillance network.

Application Requirements

- Instant expand serial COM port via USB port
- Cost-effective solution for large scale deployment
- Support for RS-232, RS-422, and RS-485 serial interface devices
- Stable and reliable USB-to-serial connections

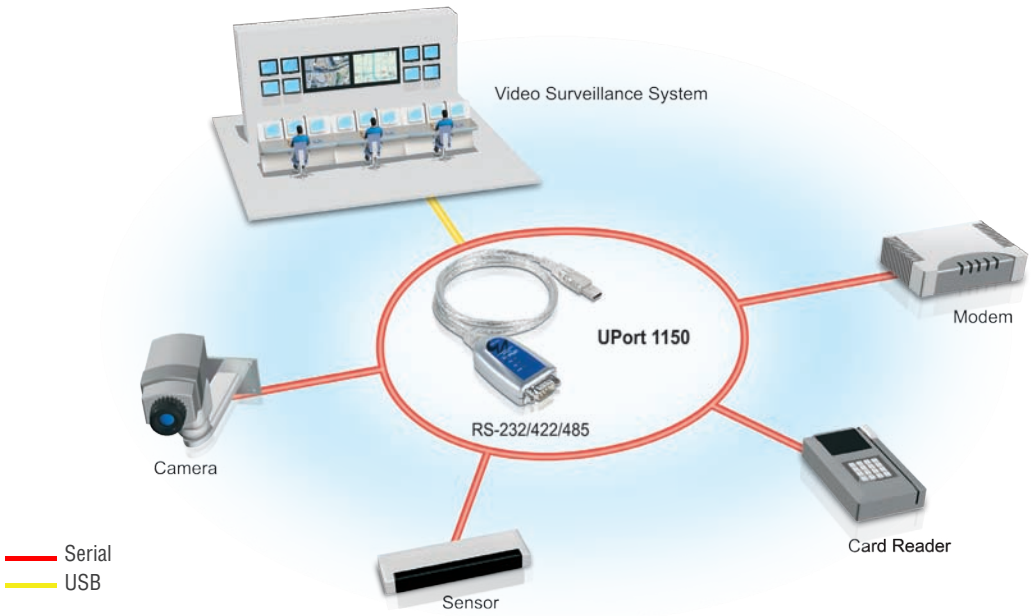
Why Moxa?

- Easy installation and plug-and-play capability
- Complete selection of USB-to-serial solutions that fulfill all serial demands
- 3-in-1 RS-232/422/485 support for connecting any serial interface device
- Driver support for various management systems (Windows, Windows CE, and Linux)

Key Products

UPort™ 1150: 1-port RS-232/422/485 USB-to-serial converter

Application Diagram



CASE STUDY

Military Satellite Truck

Seamless and reliable data transmission

Before the arrival of mobile satellite technology, military applications relied on terrestrial communication systems to collect data in remote locations and broadcast the signals to a geostationary communications satellite. Satellite trucks, which are commonly used in modern Satellite News Gathering (SNG), allow military command centers to gather intelligence and other data with greater mobility and flexibility than before.

Due to the mobile nature of SNG technology, onboard data acquisition equipment needs to be highly portable yet provide seamless and reliable communication. In addition, satellite trucks are outfitted with various degrees of video production and editing gear that need to be readily available and connected at all times. One of our military clients uses Moxa's USB-to-serial converter as their solution of choice for reliable device connectivity in their fleet of satellite trucks.

Application Requirements

- Reliable and seamless in-motion serial data transmission
- Industrial-grade design for critical environments
- Small form factor for limited space aboard satellite trucks
- Easy installation and plug & play capability

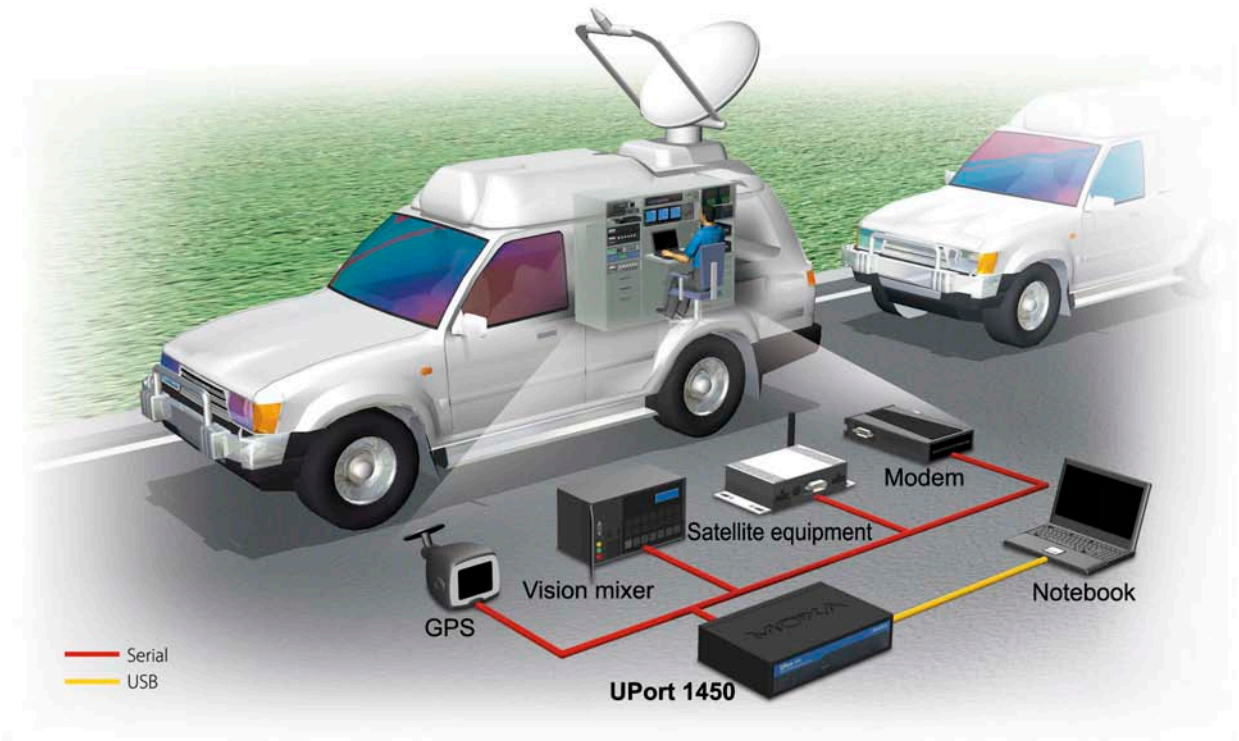
Why Moxa?

- No data loss with 128-byte FIFO and on-chip flow control for hardware and software
- Electrostatic protection and LED indicators designed for critical environments
- Small form factor and wall-mountable to save space
- Easy COM port configuration and plug & play capability
- 3-in-1 RS-232/422/485 support for connecting any serial interface device

Key Products

UPort™ 1450: 4-port RS-232/422/485 USB-to-serial converter

Application Diagram



CASE STUDY

TFT-LCD Manufacturing

Reliable connections for multiple quality inspection devices

Background

Manufacturing TFT-LCD (thin film transistor liquid crystal display) panels is a complicated and highly technical process. The three major stages in TFT-LCD panel production are the array, LC cell, and module assembly processes. In addition, each finished panel must also pass a series of quality inspection tests which include defect inspection and lighting tests.

The most challenging part of the TFT-LCD manufacturing process is achieving zero fault tolerance for high quality and productivity. One of our customers needed a USB-to-serial solution to transmit data between a host and quality inspection equipment in the TFT-LCD manufacturing process. In such a demanding manufacturing environment, adopting multiple ports and a ruggedly designed USB-to-serial product proved to be the best option.

Application Requirements

- Industrial-grade design for the TFT-LCD manufacturing process
- High quality solution for complicated high-speed data transmission to improve operational efficiency
- Support for multiple USB-to-serial expansion ports

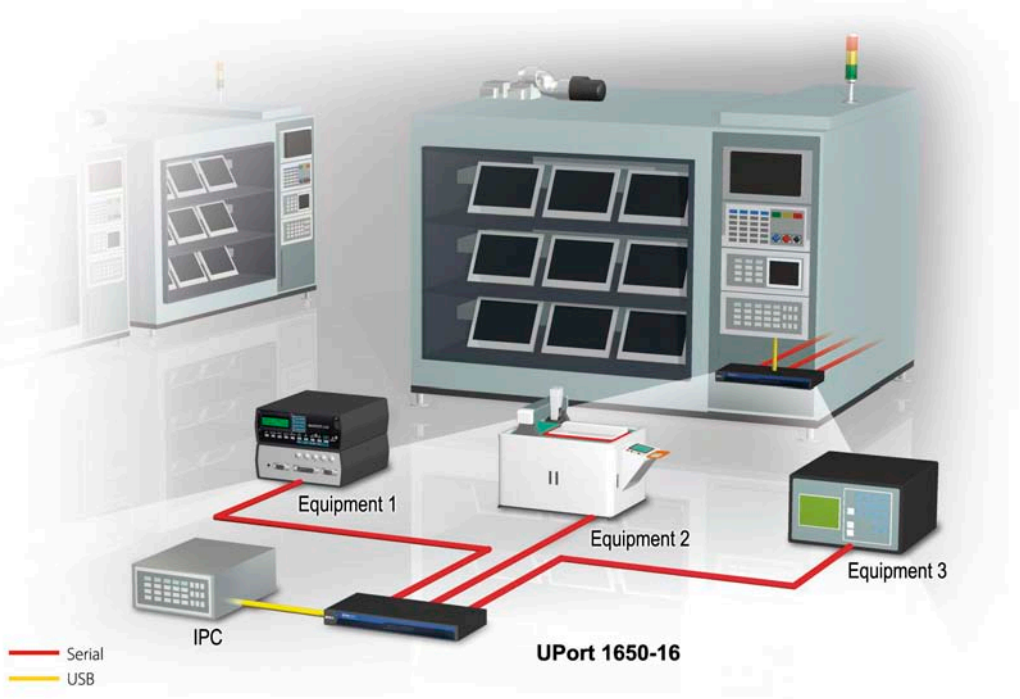
Why Moxa?

- Standard 19-inch rack-mount size and metal housing design for industrial-grade requirements
- Up to 16 ports for easy USB-to-serial expansion
- 3-in-1 serial ports for a cost efficient solution
- True USB 2.0 Hi-Speed transmission for greater productivity
- 128-byte FIFO and on-chip hardware and software flow control ensure stable data transmission during inspection
- Each serial port has its own LED indicator for easy troubleshooting

Key Products

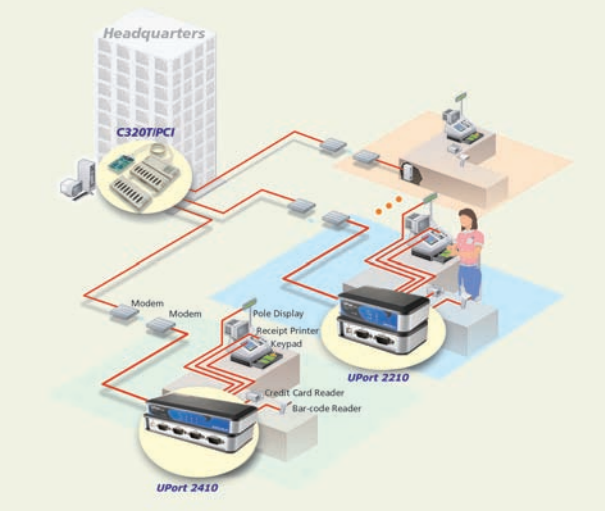
UPort™ 1650: 16-port RS-232/422/485 USB-to-serial converter

Application Diagram



Introduction to USB Connectivity

Moxa's UPort™ line of USB connectivity products include a wide range of solutions for connecting COM ports or USB ports to a PC through the PC's USB port. Moxa's UPort™ products are designed to provide true USB 2.0 Hi-Speed 480 Mbps data transmission through each port, come with LED indicators for easy monitoring, and are even suitable for heavy-load applications. The UPort™ product line includes USB-to-serial converters with 1, 2, 4, 8, or 16 independent RS-232, RS-422/485, and RS-232/422/485 serial ports for connecting data acquisition equipment and many other types of serial devices to notebooks and desktop PCs, and USB hubs with 4 or 7 USB ports for expanding the number of built-in USB ports on a host PC.



Available Products

USB-to-serial converters: UPort™ 1000 and UPort™ 2000 series
USB hubs: UPort™ 200 and UPort™ 400 series

USB-IF Certified

Moxa's UPort™ 200 and UPort™ 400 series of USB 2.0 hubs have passed USB-IF (USB Implementers Forum) certification, which verifies that products meet a number of strict electrical requirements for Hi-Speed USB operation designed to the USB 2.0 specifications. This means that the UPort™ 200/400 series support Hi-Speed USB 2.0 for up to 480 Mbps USB transmission, are fully compliant with the requirements for interoperability, provide enough power to attached devices, and can transition back to high-speed operation from the suspend state.

Reduce Short and Long Term Costs

For many applications, system integrators are moving towards using either serial-to-Ethernet or USB-to-serial products to connect serial devices to a PC. The overall costs of setting up an application is reduced, not only from a short term hardware investment perspective, but also by reducing costs associated with long term management and integration. Another big plus to using Moxa's USB-to-serial solutions is that each product supports a broad range of operating systems. Drivers are available for Windows 98/ME/2000, Windows XP/2003/Vista /2008 (x86 and x64), WinCE 5.0/6.0, and Linux 2.4/2.6 (x86 and x64).

RS-232/422/485 Support

Moxa's UPort™ 1000/2000 series of USB-to-serial products include models that support some or all of the RS-232/422/485 serial interfaces. The full slate of RS-232 signals (TxD, RxD, DTR, DSR, RTS, CTS, DCD) are supported, and both 2-wire and 4-wire RS-485 can be used. Many of Moxa's USB-to-serial products use DB9 male connectors for the serial ports, and for industrial applications, the DB9 female to terminal block accessory can be used. In addition, users can select baudrates up to 921.6 Kbps, and makefff use of the 128-byte FIFO.

Always Enough Power

Some UPort™ models support both bus power and external power through the power adaptor. Bus power can be used with laptop and workstation connections that support a 500 mA output for USB devices. An external power adaptor can be used if your computer's USB port does not provide enough amperage to run the UPort™.

Top Serial Performance

Moxa's 20-plus years of experience in serial board design is now built into a new top performance CPU called MOXA ART. This chip equips the UPort™ converters with USB 2.0 (Hi-Speed 480 Mbps), a 128-byte FIFO, on-chip hardware and software flow control, and burst data mode, making Moxa's UPort™ converters perform far better than the competition.

COM Preserver™ *

Serial transmission applications use names such as COM3 and COM4 to identify COM ports. Unfortunately, most USB-to-serial products are unable to use fixed COM names on the host PC. This means that the names of the COM ports change when the USB-to-serial device is plugged into a different USB port, either on the same or a different PC, forcing the user to reconfigure the COM names manually from within the application.

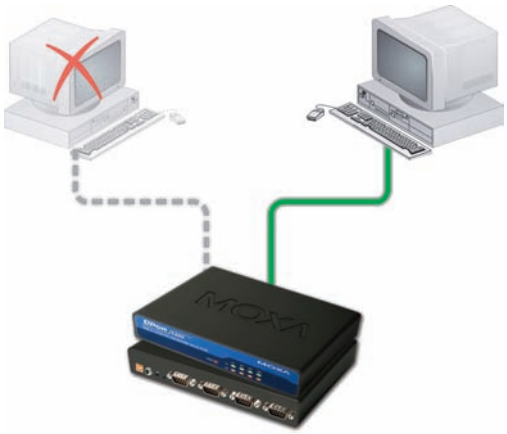
Moxa's UPort™ 1200/1400/1600 USB-to-serial hubs have an advanced feature that allows them to use fixed COM names. When the user enables the "COM Preserver™" function, the COM names "go with" the UPort™ device. In fact, Moxa's drivers can even create the same COM port names on a different host PC. With this feature, you do not need to modify application programs, or rebuild the entire project every time you install a new operating system or upgrade the computer. Don't worry about moving the UPort™ from one USB hub to another, or even from one computer to another. Once the COM Preserver™ function is enabled, the names of the USB-to-serial COM ports will go with the UPort™ wherever it is used.

Note that the COM Preserver™ function is disabled by default. Users can use the traditional method of enumerating COM ports, or enable the COM Preserver™ function to make use of this great new feature.

* Patent Pending

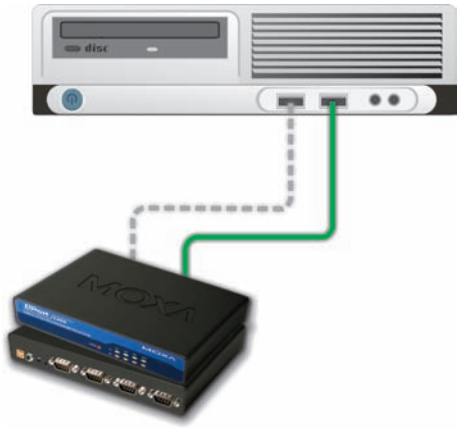
Scenario 1

COM port assignment is maintained across different PCs



Scenario 2

COM port assignment is maintained across different USB ports

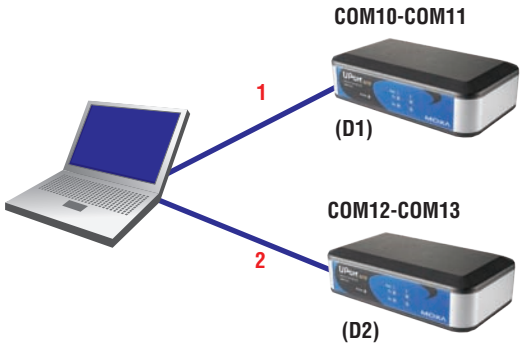


Fixed-base COM Mode

Moxa's UPort™ 1200/1400/1600 series, and UPort™ 2000 series of products provide a unique fixed-base COM function that allows users to set a specific initial COM port number. Regardless of which UPort™ is plugged into the host, the COM port numbers for the UPort's serial ports will be numbered sequentially starting with the initial COM port number.

For example, assume that you have set COM10 as the first COM number that will be assigned. If UPort™ D1 is plugged into your computer first, your computer will assign COM10 and COM11 to the UPort's serial ports. When UPort™ D2 is plugged in, the computer will assign COM numbers COM12 and COM13.

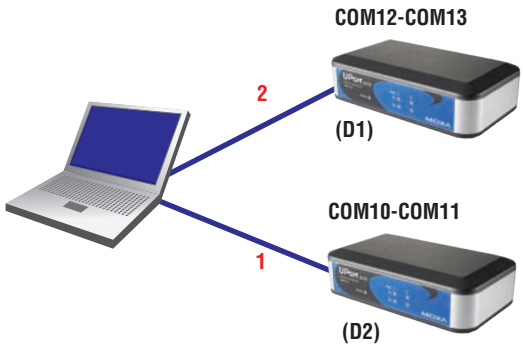
Scenario 3



If both UPorts are unplugged from the computer, and then UPort™ D2 is plugged back in, the computer will now assign COM10 and COM11 to the UPort's serial ports. When UPort™ D1 is plugged back in, COM numbers COM12 and COM13 will be assigned the UPort's serial ports.

When "Fixed-base COM Mode" is enabled for the first time, all COM port numbers and serial port parameters will be reset to their default values. You can then set the COM numbers and configuration parameters to the values needed for your application.

Scenario 4



Magnet Accessory for Attaching to PC Housing

The typical way to use a device such as the UPort™ 1400/1610-8/1650-8 is to place the UPort™ on the desk near the laptop or desktop PC. However, placing the UPort™ in this way wastes space, and due to the nature of USB, makes it more likely that the connection between the PC and UPort™ will get disconnected. The "magnet" solution introduced by Moxa is simple, but innovative. The solution uses magnet accessories that come with the product to attach the UPort™ to the host PC's housing. Not only do you save space, but you can also fix the position of the USB cable that attaches the UPort™ to the PC.

COM Port Numbers Displayed in Windows System Tray

When using a UPort™ to connect a serial device to your PC, it may be necessary to determine the COM port number assigned to the serial device. A new tool provided by Moxa gives engineers a handy means of monitoring the COM port number of the device. When the UPort™ is plugged into your computer's USB port, a UPort™ icon will be placed in the Windows System Tray located in the lower right corner of the desktop. Simply position the cursor over the UPort™ icon, and an information window showing the COM port number will pop up. When two or more UPorts are connected to the same computer, the pop-up window will show the COM numbers for all of the UPorts.

UPort™ Models Listed by Interface and Number of Ports

USB-to-Serial Converters

Interface	No. of Ports	Model Name
RS-232	1	UPort™ 1110
	2	UPort™ 2210
	4	UPort™ 1410
		UPort™ 2410
	8	UPort™ 1610-8
	16	UPort™ 1610-16
RS-422/485	1	UPort™ 1130
	2	UPort™ 2230
	4	UPort™ 2430
RS-232/422/485	1	UPort™ 1150/1150I
	2	UPort™ 1250/1250I
	4	UPort™ 1450/1450I
	8	UPort™ 1650-8
	16	UPort™ 1650-16

USB Hubs

Interface	No. of Ports	Model Name
USB	4	UPort™ 204
	4	UPort™ 404
	7	UPort™ 207
	7	UPort™ 407
	4	UPort™ 404-T
	7	UPort™ 407-T

UPort™ 1110/1130/1150

1-port RS-232, RS-422/485, and RS-232/422/485 USB-to-serial converters

Terminal Block Adaptor for UPort™ 1130/1150

- Compatible with USB 2.0
- 12 Mbps USB data rate
- 921.6 Kbps maximum baudrate for super fast data transmission
- Drivers provided for Windows, WinCE, and Linux
- Mini DB9 female to terminal block adaptor for easy wiring
- LEDs for indicating USB and TxD/RxD activity
- 15 KV ESD protection for all serial ports

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Instant Plug & Play

The UPort™ 1110/1130/1150 USB-to-serial converters are the perfect accessory for laptop computers that don't have a serial port. The UPort™ 1110 converts from USB to RS-232, the UPort™ 1130 from USB to RS-422/485, and the UPort™ 1150 from USB to RS-232/422/485. All three products are compatible with new and legacy serial devices, and can be used with mobile, instrumentation, and point-of-sale applications.

Specifications

USB Interface

Compliance: USB 1.0/1.1 compliant, USB 2.0 compatible
Connector: USB type A
Speed: 12 Mbps (Full-Speed USB)

Serial Interface

Number of Ports: 1
Serial Standards:
UPort™ 1110: RS-232
UPort™ 1130: RS-422/485
UPort™ 1150: RS-232/422/485
Connector: DB9 male

Serial Line Protection

ESD Protection: 15 KV embedded

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS
FIFO: 64 bytes

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows (98/ME/2000, XP/2003/Vista x86/x64), WinCE 5.0/6.0, Linux 2.4, Linux 2.6 x86/x64

Physical Characteristics

Housing: ABS + PC
Weight:
Product only: 65 g (0.14 lb)
Packaged: 200 g (0.44 lb)
Dimensions: 38.4 x 60 x 20 mm (1.51 x 2.36 x 0.79 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 70°C (-4 to 158°F)
Regulatory Approvals: EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC-61000-4-6, IEC 61000-4-8, IEC-61000-4-11, FCC Part 15 Class B

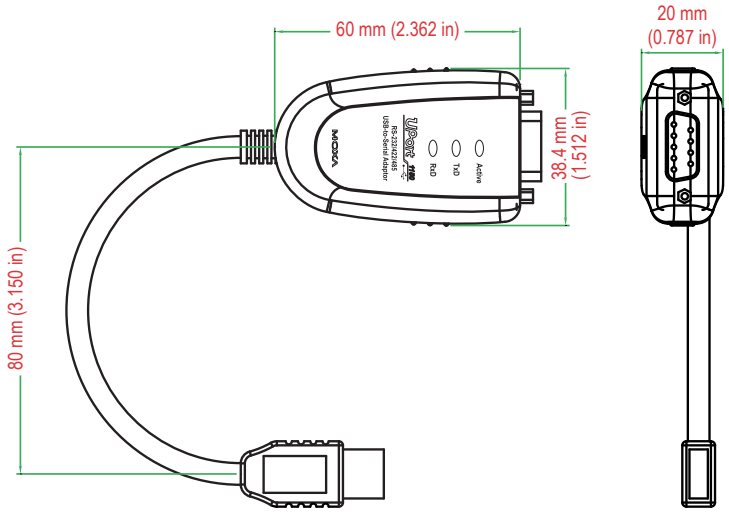
Power Requirements

Power Consumption:
UPort™ 1110: 30 mA @ 5 VDC
UPort™ 1130: 90 mA @ 5 VDC
UPort™ 1150: 77 mA @ 5 VDC

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Available Models

UPort™ 1110: 1-port RS-232 USB-to-serial converter
UPort™ 1130: 1-port RS-422/485 USB-to-serial converter
UPort™ 1150: 1-port RS-232/422/485 USB-to-serial converter

Package Checklist

- UPort™ 1110 or 1130 or 1150 USB-to-serial converter
- 1 mini DB9 female to terminal block adaptor (UPort™ 1130 and 1150 only)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

UPort™ 1150I

1-port RS-232/422/485 USB-to-serial converter with 2 KV isolation

- Compatible with USB 2.0
- 12 Mbps USB data rate
- 15N high retention USB type B connector
- Software selectable RS-232, RS-422, 4-wire RS-485, and 2-wire RS-485
- Drivers provided for Windows, WinCE, and Linux
- 15 KV ESD protection for all serial ports
- 2 KV optical isolation protection
- Full modem status LEDs for UPort™ 1150I

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Instant Plug & Play

The UPort™ 1150I USB-to-serial converter allows you to connect 1 RS-232/422/485 device to your laptop or workstation through the USB (Universal Serial Bus) port. This plug & play USB solution is compatible with both new and legacy RS-232/422/485 devices, and is perfect for mobile, instrumentation, and point-of sale applications.

Simplified, Hassle-free Serial Port Expansion

USB plug & play makes serial port expansion easy, and does not require IRQ, DMA, or I/O address resources. Users no longer need to open the chassis or power down the system to add COM ports, saving on setup time and cost.

Specifications

USB Interface

Compliance: USB 1.0/1.1 compliant, USB 2.0 compatible
Connector: USB type B
Speed: 12 Mbps (Full-Speed USB)

Serial Interface

Number of Ports: 1
Serial Standards: RS-232/422/485
Connector: DB9 male

Serial Line Protection

ESD Protection: 15 KV embedded
Optical Isolation: 2 KV

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS
FIFO: 64 bytes

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows (98/ME/2000, XP/2003/Vista x86/x64), WinCE 5.0/6.0, Linux 2.4, Linux 2.6 x86/x64

Physical Characteristics

Housing: SECC sheet metal (1 mm), IP30 protection
Weight:
Product only: 75 g (0.65 lb)
Packaged: 320 g (0.72 lb)
Dimensions: 52 x 80 x 22 mm (2.05 x 3.15 x 0.87 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 70°C (-4 to 158°F)
Regulatory Approvals: EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC-61000-4-6, IEC 61000-4-8, IEC-61000-4-11, FCC Part 15 Class B

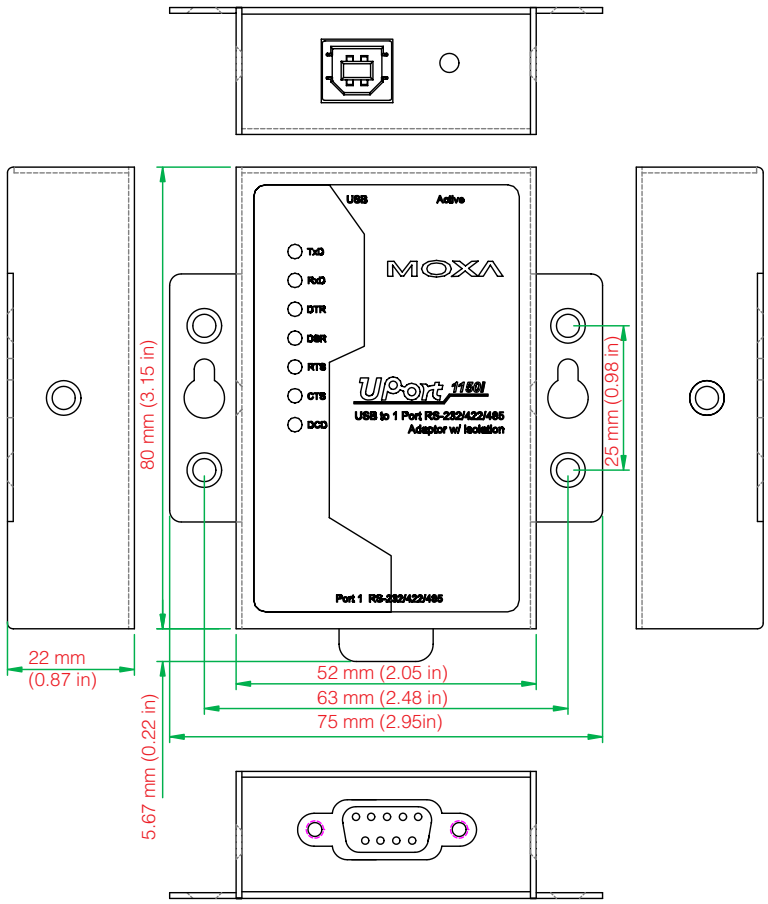
Power Requirements

Power Consumption: 260 mA @ 5 VDC

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Available Models

UPort™ 1150I: 1-port RS-232/422/485 USB-to-serial converter with 2 KV optical isolation

Optional Accessories (can be purchased separately)

DK35A: Mounting kit for 35-mm DIN-Rail

Package Checklist

- UPort™ 1150I USB-to-serial converter
- USB-IF certified cable
- 1 mini DB9 female to terminal block adaptor
- Velcro lock-down strap for the USB cable
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

UPort™ 1250/1250I

2-port RS-232/422/485 USB-to-serial converters with optional 2 KV isolation

UPort™ 1250

UPort™ 1250I

- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- 15N high retention type B connector
- Drivers provided for Windows, WinCE, and Linux
- LEDs for easy monitoring
- 15 KV ESD protection for all serial ports
- Locking power cord for the UPort™ 1250I

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Instant Plug & Play

The UPort™ 1250/1250I USB-to-serial converters allow you to connect 2 RS-232/422/485 devices to your laptop or workstation through the USB (Universal Serial Bus) port. These plug & play USB solutions are perfect for mobile, instrumentation, and point-of sale applications.

Simplified, Hassle-free Serial Port Expansion

USB plug & play makes serial port expansion easy, and does not require IRQ, DMA, or I/O address resources. Users no longer need to open the chassis or power down the system to add COM ports, saving on setup time and cost.

Top Serial Performance

Moxa's 20-plus years of experience in serial board design is now built into a new top performance CPU called MOXA ART. This chip equips the UPort™ 1250/1250I converters with USB 2.0 (Hi-Speed 480 Mbps), a 128-byte FIFO, on-chip hardware and software flow control, and burst data mode, making Moxa's UPort™ converters the top performing USB-to-serial converters in the world.

Specifications

USB Interface

Compliance: USB 1.1/2.0 compliant
Connector: USB type B
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Serial Interface

Number of Ports: 2
Serial Standards: RS-232/422/485
Connector: DB9 male

Serial Line Protection

ESD Protection: 15 KV embedded
Optical Isolation: 2 KV (UPort™ 1250I only)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS
FIFO: 128 bytes

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Direction: ADDC® (Automatic Data Direction Control)

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista x86/x64), Win CE 5.0/6.0, Linux 2.4, Linux 2.6 x86/x64

Physical Characteristics

Housing: SECC sheet metal (1 mm), IP30 protection

Weight:
Product only: 180 g (0.40 lb)
Packaged:
UPort™ 1250: 370 g (0.82 lb)
UPort™ 1250I: 680 g (1.5 lb)

Dimensions: 77 x 26 x 111 mm (3.03 x 1.02 x 4.37 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 75°C (-4 to 167°F)

Regulatory Approvals: EN55022 Class A, EN55024, EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, IEC 61000-4-8, IEC 61000-4-11, FCC Part 15 Class A, UL, CUL, TÜV

Power Requirements

Power Consumption:
UPort™ 1250 (bus power): 360 mA @ 5 VDC
UPort™ 1250I (12 to 48 VDC external power): 200 mA @ 12 VDC

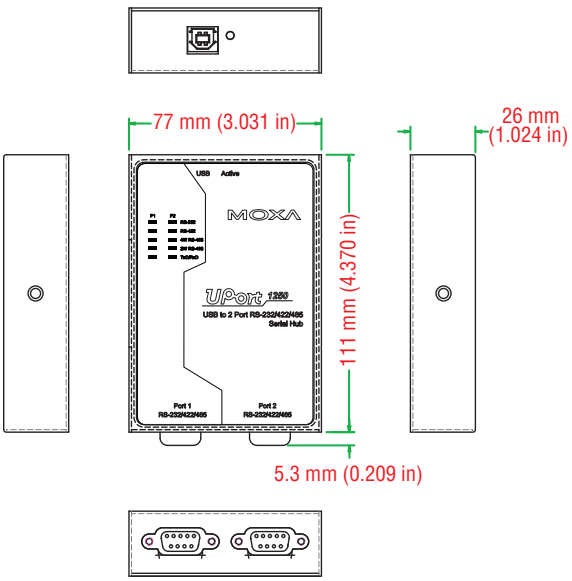
Warranty

Warranty Period: 5 years

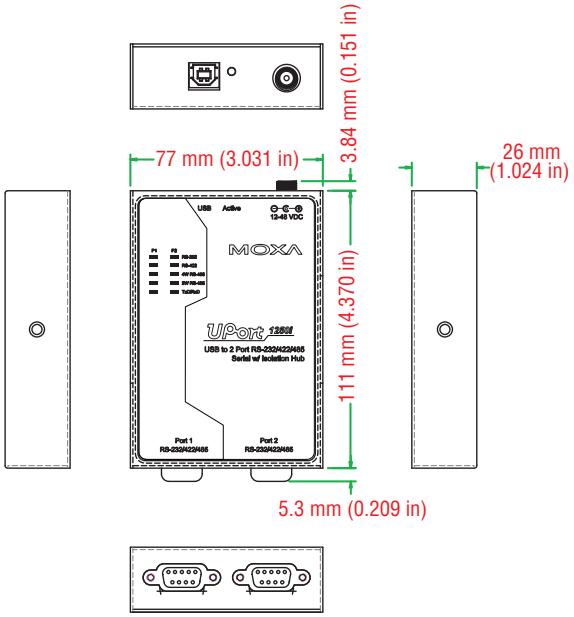
Details: See www.moxa.com/warranty

Dimensions

UPort™ 1250



UPort™ 1250I



Ordering Information

Available Models

UPort™ 1250: 2-port RS-232/422/485 USB-to-serial converter

UPort™ 1250I: 2-port RS-232/422/485 USB-to-serial converter with 2 KV optical isolation, adaptor included

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB Adaptor: DB9 female to terminal block adaptor for RS-422/485 applications

Wall Mount Kit: Metal plates and screws

DK35A: Mounting kit for 35-mm DIN-Rail

Package Checklist

- UPort™ 1250 or 1250I USB-to-serial converter
- USB-IF certified cable
- 1 mini DB9 female to terminal block adaptor
- Power adaptor (UPort™ 1250I)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

UPort™ 1400 Series

4-port RS-232 and RS-232/422/485 USB-to-serial converters with optional 2 KV isolation

- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- 921.6 Kbps maximum baudrate for super fast data transmission
- 15N high retention USB type B connector
- 128-byte FIFO and on-chip H/W, S/W flow control
- Built-in 15 KV ESD protection for all serial ports
- 2 KV optical isolation protection (UPort™ 1450I only)
- IP30-rated, rugged metal housing
- COM port assignments maintained across different PCs
- Drivers provided for Windows, WinCE, and Linux
- Choose bus power or external power (UPort™ 1410/1450 only)
- Locking power cord

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Instant Plug & Play

The UPort™ 1400 USB-to-serial converters allow you to connect 4 RS-232 or RS-232/422/485 devices to your laptop or workstation through the USB (Universal Serial Bus) port. The UPort™ 1400 converters are compatible with new and legacy serial devices, and are perfect for mobile, instrumentation, and point-of-sale applications.

Simplified, Hassle-free Serial Port Expansion

USB plug & play makes serial port expansion easy, and does not require IRQ, DMA, or I/O address resources. Users no longer need to open the chassis or power down the system to add COM ports, saving on setup time and cost.

Top Serial Performance

Moxa's 20-plus years of experience in serial board design is now built into a new top performance CPU called MOXA ART. This chip equips the UPort™ 1400 converters with USB 2.0 (Hi-Speed 480 Mbps), a 128-byte FIFO, on-chip hardware and software flow control, and burst data mode, making Moxa's UPort™ converters perform far better than the competition.

Specifications

USB Interface

Compliance: USB 1.1/2.0 compliant
Connector: USB type B
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Serial Interface

Number of Ports: 4
Serial Standards:
UPort™ 1410: RS-232
UPort™ 1450/1450I: RS-232/422/485
Connector: DB9 male

Serial Line Protection

ESD Protection: 15 KV embedded
Optical Isolation: 2 KV (UPort™ 1450I only)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS
FIFO: 128 bytes

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Direction: ADDC® (Automatic Data Direction Control)

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista x86/x64), WinCE 5.0/6.0, Linux 2.4, Linux 2.6 x86/x64

Physical Characteristics

Housing: SECC sheet metal (1 mm), IP30 protection

Weight:
Product only: 720 g (1.59 lb)
Packaged: 1320 g (2.91 lb)

Dimensions: 204 x 30 x 125 mm (8.03 x 1.18 x 4.92 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 75°C (-4 to 167°F)

Regulatory Approvals: EN55022 Class A, EN55024, EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11, FCC Part 15 Class A, UL, CUL, TÜV

Power Requirements

Power Consumption:

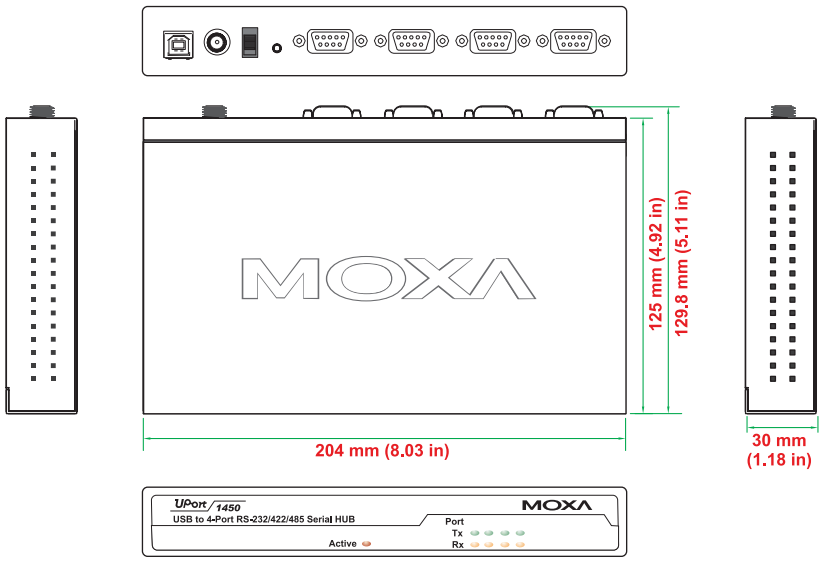
- Bus power:
  UPort™ 1410: 180 mA @ 5 VDC
- 12 to 48 VDC external power:
  UPort™ 1410: 180 mA @ 12 VDC
  UPort™ 1450: 260 mA @ 12 VDC
  UPort™ 1450I: 360 mA @ 12 VDC

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Available Models

UPort™ 1410: 4-port RS-232 USB-to-serial converter

UPort™ 1450: 4-port RS-232/422/485 USB-to-serial converter, adaptor included

UPort™ 1450I: 4-port RS-232/422/485 USB-to-serial converter with 2 KV optical isolation, adaptor included

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB adaptor: DB9 female to terminal block adaptor for RS-422/485 applications

Magnet Accessory: Magnets for attaching the UPort™ 1400 to the PC's housing

Wall Mount Kit: Metal plates and screws

DIN-Rail Kit: DIN-Rail kit for the UPort™ 1400 series

DK35A: Mounting kit for 35-mm DIN-Rail

Package Checklist

- UPort™ 1400 USB-to-serial converter
- USB-IF certified cable
- 1 mini DB9 female to terminal block adaptor (UPort™ 1450 and 1450I only)
- Power adaptor (UPort™ 1450 and 1450I only)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Power Adaptor (can be purchased separately)

Note: Available for the UPort™ 1410 if the USB port does not provide enough power. You must purchase the adaptor plus one power cord.

PWR-12120-DT-S2: 240 VAC to 12 VDC @ 1.2 A power adaptor

PWC-C7US-2B-183: US plug, 2-pin power cord

PWC-C7UK-2B-183: UK plug, 2-pin power cord

PWC-C7EU-2B-183: EU plug, 2-pin power cord

PWC-C7JP-2B-183: JP plug, 2-pin power cord

PWC-C7AU-2B-183: SAA plug, 2-pin power cord

UPort™ 1600-8 Series

8-port RS-232 and RS-232/422/485 USB-to-serial converters

- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- 921.6 Kbps maximum baudrate for super fast data transmission
- 15N high retention USB type B connector
- 128-byte FIFO and on-chip H/W, S/W flow control
- Built-in 15 KV ESD protection for all serial ports
- IP30-rated, rugged metal housing
- COM port assignments maintained across different PCs
- Mini DB9 female to terminal block adaptor for easy wiring
- Drivers provided for Windows, WinCE, and Linux
- Locking power cord

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Instant Plug & Play

The UPort™ 1600-8 USB-to-serial converters allow you to connect 8 RS-232 or RS-232/422/485 devices to your laptop or workstation through the USB (Universal Serial Bus) port. The UPort™ 1600-8 converters are compatible with new and legacy serial devices, and are perfect for mobile, instrumentation, and point-of-sale applications.

Simplified, Hassle-free Serial Port Expansion

USB plug & play makes serial port expansion easy, and does not require IRQ, DMA, or I/O address resources. Users no longer need to open the chassis or power down the system to add COM ports, saving on setup time and cost.

Top Serial Performance

Moxa's 20-plus years of experience in serial board design is now built into a new top performance CPU called MOXA ART. This chip equips the UPort™ 1600-8 converters with USB 2.0 (Hi-Speed 480 Mbps), a 128-byte FIFO, on-chip hardware and software flow control, and burst data mode, making Moxa's UPort™ converters perform far better than the competition.

Specifications

USB Interface

Compliance: USB 1.1/2.0 compliant
Connector: USB type B
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Serial Interface

Number of Ports: 8
Serial Standards:
UPort™ 1610-8: RS-232
UPort™ 1650-8: RS-232/422/485
Connector: DB9 male

Serial Line Protection

ESD Protection: 15 KV embedded

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS
FIFO: 128 bytes

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Direction: ADDC® (Automatic Data Direction Control)

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista x86/x64), WinCE 5.0/6.0, Linux 2.4, Linux 2.6 x86/x64

Physical Characteristics

Housing: SECC sheet metal (1 mm), IP30 protection

Weight:
Product only: 835 g (1.84 lb)
Packaged: 1440 g (3.17 lb)

Dimensions: 204 x 44 x 125 mm (8.03 x 1.73 x 4.92 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 75°C (-4 to 167°F)

Regulatory Approvals: EN55022 Class A, EN55024, EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11, FCC Part 15 Class A, UL, CUL, TÜV

Power Requirements

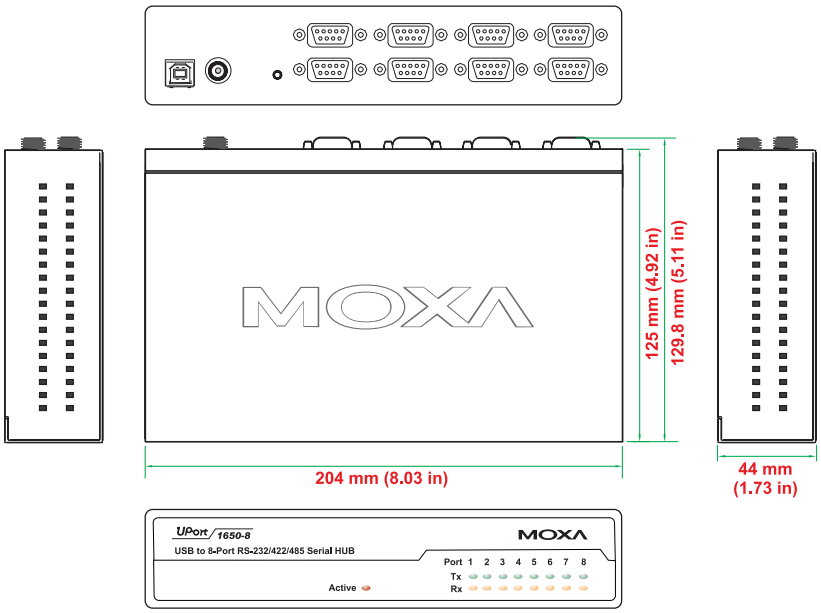
Power Consumption:
UPort™ 1610-8 (12 to 48 VDC external power): 230 mA @ 12 VDC
UPort™ 1650-8 (12 to 48 VDC external power): 340 mA @ 12 VDC

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Available Models

UPort™ 1610-8: 8-port RS-232 USB-to-serial converter, adaptor included

UPort™ 1650-8: 8-port RS-232/422/485 USB-to-serial converter, adaptor included

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB Adaptor: DB9 female to terminal block adaptor for RS-422/485 applications

Magnet Accessory: Magnets for attaching the UPort™ 1600-8 to the PC's housing

Wall Mount Kit: Metal plates and screws

DIN-Rail Kit: DIN-Rail kit for the UPort™ 1600-8 series

DK35A: Mounting kit for 35-mm DIN-Rail

Package Checklist

- UPort™ 1600-8 USB-to-serial converter
- USB-IF certified cable
- Power adaptor
- 1 mini DB9 female to terminal block adaptor (UPort™ 1650-8 only)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

UPort™ 1600-16 Series

16-port RS-232 and RS-232/422/485 USB-to-serial converters

- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- 921.6 Kbps maximum baudrate for super fast data transmission
- 15N high retention USB type B connector
- 128-byte FIFO and on-chip H/W, S/W flow control
- Standard 19-inch rack-mountable
- Built-in 15 KV ESD protection on all serial ports
- IP30-rated, rugged metal housing
- COM port assignments maintained across different PCs
- Mini DB9 female to terminal block adaptor for easy wiring
- Drivers provided for Windows, WinCE, and Linux

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Instant Plug & Play

The UPort™ 1600-16 USB-to-serial converters allow you to connect 16 RS-232 or RS-232/422/485 devices to your laptop or workstation through the USB (Universal Serial Bus) port. The UPort™ 1600-16 converters are compatible with new and legacy serial devices, and are perfect for mobile, instrumentation, and point-of-sale applications.

Simplified, Hassle-free Serial Port Expansion

USB plug & play makes serial port expansion easy, and does not require IRQ, DMA, or I/O address resources. Users no longer need to open the chassis or power down the system to add COM ports, saving on setup time and cost.

Top Serial Performance

Moxa's 20-plus years of experience in serial board design is now built into a new top performance CPU called MOXA ART. This chip equips the UPort™ 1600-16 converters with USB 2.0 (Hi-Speed 480 Mbps), a 128-byte FIFO, on-chip hardware and software flow control, and burst data mode, making Moxa's UPort™ converters perform far better than the competition.

Specifications

USB Interface

Compliance: USB 1.1/2.0 compliant
Connector: USB type B
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Serial Interface

Number of Ports: 16
Serial Standards:
UPort™ 1610-16: RS-232
UPort™ 1650-16: RS-232/422/485
Connector: DB9 male

Serial Line Protection

ESD Protection: 15 KV embedded

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS
FIFO: 128 bytes

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Direction: ADDC® (Automatic Data Direction Control)

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista x86/x64), Win CE 5.0/6.0, Linux 2.4, Linux 2.6 x86/x64

Physical Characteristics

Housing: SECC sheet metal (1 mm), IP30 protection

Weight:
Product only: 2475 g (5.45 lb)
Packaged: 3440 g (7.58 lb)

Dimensions: 440 x 45.5 x 198.1 mm (17.32 x 1.79 x 7.80 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 75°C (-4 to 167°F)

Regulatory Approvals: EN55022 Class A, EN55024, EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11, FCC Part 15 Class A, UL, CUL, TÜV

Power Requirements

Input Voltage: 100 to 240 VAC external power

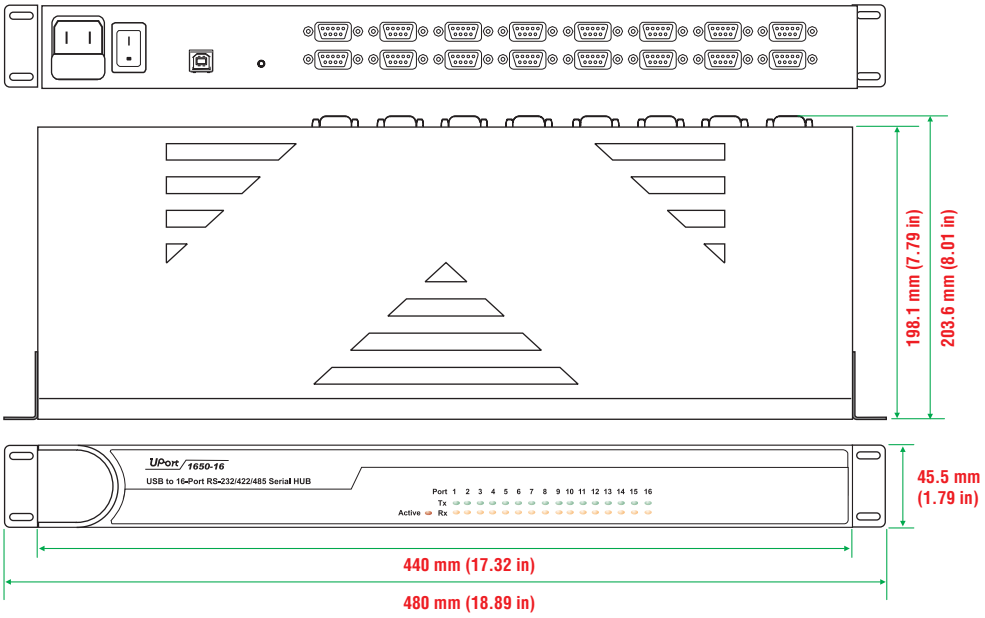
Power Consumption:
UPort™ 1610-16: 130 mA @ 100 VAC
UPort™ 1650-16: 150 mA @ 100 VAC

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Available Models

UPort™ 1610-16: 16-port RS-232 USB-to-serial converter

UPort™ 1650-16: 16-port RS-232/422/485 USB-to-serial converter

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB Adaptor: DB9 female to terminal block adaptor for RS-422/485 applications

Rackmount Kit: Metal plates and screws

Package Checklist

- UPort™ 1600-16 USB-to-serial converter
- USB-IF certified cable
- Power cord
- 1 mini DB9 female to terminal block adaptor (UPort™ 1650-16 only)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

UPort™ 2210/2410

2 and 4-port RS-232 USB-to-serial converters

UPort™ 2210

UPort™ 2410

- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- 921.6 Kbps maximum baudrate for super fast data transmission
- Additional I/O and IRQ not needed
- Built-in 15 KV ESD protection for all serial ports
- Drivers provided for Windows and Linux
- Supports Fixed-Base COM Utility for setting the initial extended COM port number
- LEDs for easy monitoring

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Instant Plug & Play

The UPort™ 2210/2410 USB-to-serial converters allow you to connect 2 or 4 RS-232 devices to your laptop or workstation through the USB (Universal Serial Bus) port. The UPort™ 2210 and UPort™ 2410 are cost-effective solutions for both new and legacy RS-232 devices, and are perfect for mobile, instrumentation, and point-of sale applications.

Simplified, Hassle-free Serial Port Expansion

USB plug & play makes serial port expansion easy, and does not require IRQ, DMA, or I/O address resources. Users no longer need to open the chassis or power down the system to add COM ports, saving on setup time and cost.

Easy-to-Use Windows Utility

The UPort™ 2210/2410 Windows utility supports the fixed-base COM function, which assigns COM port numbers sequentially, starting from a specific initial COM port number. The fixed-base COM function not only saves setup time and cost, but also provides users with a solution suitable for a variety of applications.

Specifications

USB Interface

Compliance: USB 1.1/2.0 compliant

Connector: USB type B

Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Serial Interface

Number of Ports:
UPort™ 2210: 2
UPort™ 2410: 4

Serial Standards: RS-232

Connector: DB9 male

Serial Line Protection

ESD Protection: 15 KV embedded

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd

Flow Control: RTS/CTS, XON/XOFF

I/O Address: Assigned by BIOS

IRQ: Assigned by BIOS

FIFO: 16 bytes

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64), Linux 2.6 x86/x64

Physical Characteristics

Housing: Polycarbonate (PC)

Weight:
Product only:
UPort™ 2210: 120 g (0.26 lb)
UPort™ 2410: 210 g (0.46 lb)
Packaged:
UPort™ 2210: 325 g (0.72 lb)
UPort™ 2410: 455 g (1 lb)

Dimensions:
UPort™ 2210: 70 x 35 x 120 mm (2.76 x 1.38 x 4.72 in)
UPort™ 2410: 80 x 35 x 185 mm (3.15 x 1.38 x 7.28 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 75°C (-4 to 167°F)

Regulatory Approvals: EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11, FCC Part 15 Class B

Power Requirements

Power Consumption:
UPort™ 2210: 140 mA @ 5 VDC
UPort™ 2410: 240 mA @ 5 VDC

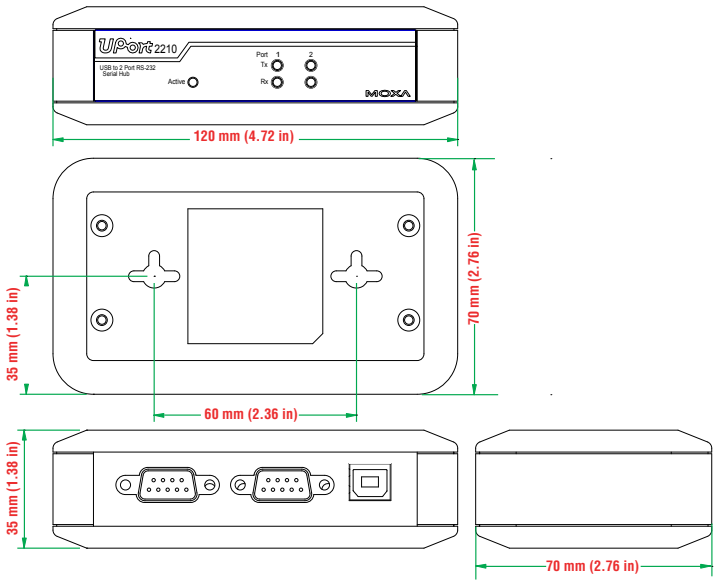
Warranty

Warranty Period: 5 years

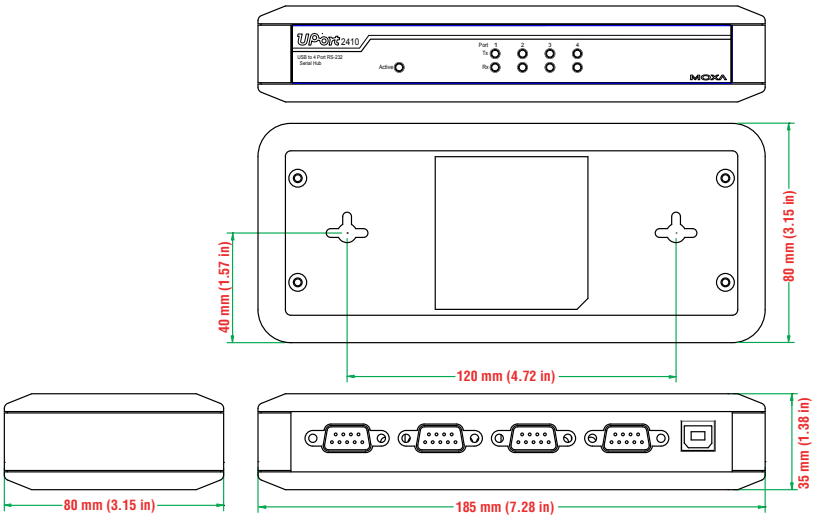
Details: See www.moxa.com/warranty

Dimensions

UPort™ 2210



UPort™ 2410



Ordering Information

Available Models

UPort™ 2210: 2-port RS-232 USB-to-serial converter

UPort™ 2410: 4-port RS-232 USB-to-serial converter

Package Checklist

- UPort™ 2210 or UPort™ 2410
- USB-IF certified cable
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Coming Soon

UPort™ 2230/2430

2 and 4-port RS-422/485 USB-to-serial converters

- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- Additional I/O and IRQ not needed
- Built-in 15 KV ESD protection for all serial ports
- Drivers provided for Windows and Linux
- Supports Fixed-Base COM Utility for setting the initial COM number
- LEDs for easy monitoring
- 921.6 Kbps maximum baudrate for super fast data transmission
- Wall mountable

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Instant Plug & Play

The UPort™ 2230/2430 USB-to-serial converters allow you to connect 2 or 4 RS-422/485 devices to your laptop or workstation through the USB (Universal Serial Bus) port. The UPort™ 2230/2430 are cost-effective solutions for both new and legacy RS-422/485 devices, and are perfect for mobile, instrumentation, and point-of sale applications.

Simplified, Hassle-free Serial Port Expansion

USB plug & play makes serial port expansion easy, and does not require IRQ, DMA, or I/O address resources. Users no longer need to open the housing or power down the system to add COM ports, saving on setup time and cost.

Specifications

USB Interface

Compliance: USB 1.1/2.0 compliant

Connector: USB type B

Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Serial Interface

Number of Ports:
UPort™ 2230: 2
UPort™ 2430: 4

Serial Standards: RS-422/485

Connector: DB9 male

Serial Line Protection

ESD Protection: 15 KV embedded

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd

Flow Control: RTS/CTS, XON/XOFF

I/O Address: Assigned by BIOS

IRQ: Assigned by BIOS

FIFO: 16 bytes

Serial Signals

RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND

RS-485-4W: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND

RS-485-2W: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows (2000, XP/2003/Vista/2008 x86/x64), Linux 2.6 x86/x64

Physical Characteristics

Housing: Polycarbonate (PC)

Dimensions:
UPort™ 2230: 70 x 35 x 120 mm (2.76 x 1.38 x 4.72 in)
UPort™ 2430: 80 x 35 x 185 mm (3.15 x 1.38 x 7.28 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 75°C (-4 to 167°F)

Regulatory Approvals: EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11, FCC Part 15 Class B

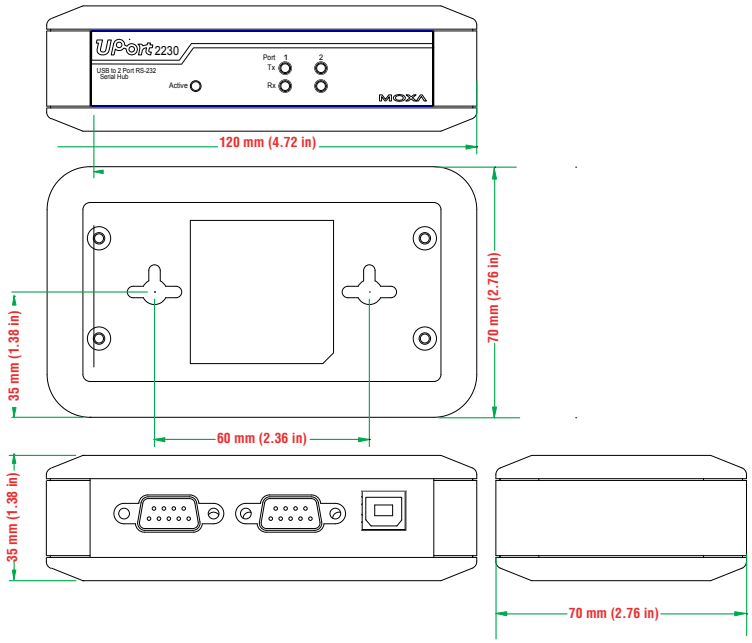
Warranty

Warranty Period: 5 years

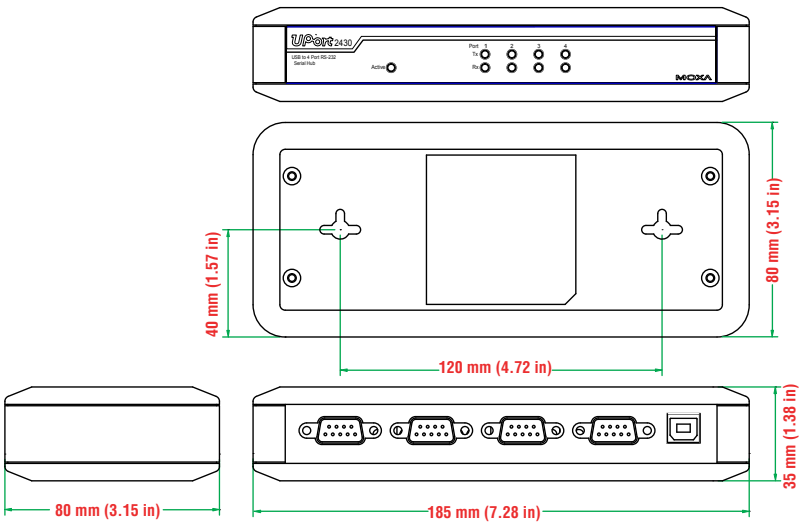
Details: See www.moxa.com/warranty

Dimensions

UPort™ 2230



UPort™ 2430



Ordering Information

Available Models

UPort™ 2230: 2-port RS-422/485 USB-to-serial converter
UPort™ 2430: 4-port RS-422/485 USB-to-serial converter

Package Checklist

- UPort™ 2230 or UPort™ 2430
- USB-IF certified cable
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

UPort™ 404/407

4 and 7-port industrial-grade USB hubs

- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- USB-IF certification
- Dual power inputs (power jack and terminal block)
- 15 KV ESD Level 4 protection for all USB ports
- Rugged metal housing
- DIN-Rail and wall mountable
- Comprehensive diagnostic LEDs
- Choose bus power or external power (UPort™ 404)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The UPort™ 404 and UPort™ 407 are industrial-grade USB 2.0 hubs that expand 1 USB port into 4 and 7 USB ports, respectively. The hubs are designed to provide true USB 2.0 Hi-Speed 480 Mbps data transmission through each port, even for heavy-load applications. The UPort™ 404/407 have received USB-IF Hi-Speed certification, which is an indication that both products are reliable, high quality USB 2.0 hubs.In addition, the hubs are fully compliant with the USB Plug & Play spec and provide a full 500 mA of power per port, ensuring that your USB devices will function properly. The UPort™ 404/407 hubs' support of 12-40 VDC power makes them ideal for mobile applications. Externally powered USB hubs are the only way to guarantee the broadest compatibility with USB devices.

USB-IF Certification

The UPort™ 404 and UPort™ 407 USB 2.0 industrial-grade USB hubs have passed USB-IF (USB Implementers Forum) certification. USB-IF verifies a number of strict electrical requirements for the high-speed USB operation of USB hubs designed to the USB 2.0 specification. This means that the UPort™ 404/407 support Hi-Speed USB 2.0 for up to 480 Mbps USB transmission, which is fully compliant with interoperability requirements, is enough power for devices to function, and provides for a successful transition back to high-speed operation from the suspend state.

ESD Level 4 Protection

Electrostatic discharge (ESD) could be as severe as having more than one thousand volts of ESD with a high rise time (dv/dt) break through the junction layer of protective devices. In order to avoid serious damage, Moxa's UPort™ 404/407 USB hubs provide ESD level 4 (contact 8 KV, air 15 KV) protection, which increases the quality and value of the user's end-product.

Specifications

USB Interface

Compliance: USB 1.1/2.0 compliant

Upstream: 1 USB port, Type B connector

Downstream:
UPort™ 404: 4 USB ports, Type A connectors
UPort™ 407: 7 USB ports, Type A connectors

Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Supply Current: 500 mA max. per channel

Physical Characteristics

Housing: Aluminum

Dimensions:
UPort™ 404: 80 x 35 x 130 mm (3.15 x 1.38 x 5.12 in)
UPort™ 407: 100 x 35 x 192 mm (3.94 x 1.38 x 7.55 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temperature Models: -40 to 85°C (-40 to 185°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 75°C (-4 to 167°F)
Wide Temperature Models: -40 to 85°C (-40 to 185°F)

Regulatory Approvals: EN61000-3-2, EN61000-3-3, EN61000-4-2,EN61000-4-3,EN61000-4-4,EN61000-4-5,EN61000-4-6,EN61000-4-8, EN61000-4-11,EN61000-6-2, EN61000-6-4, FCC Part 15 Class A, UL508 (Maximum Surrounding Air Temperature: 60°C), LVD

Power Requirements

Input Voltage: 12 to 40 VDC external power

Power Consumption:
UPort™ 404: 1300 mA @ 12 VDC, 690 mA @ 24 VDC, 470 mA @ 36 VDC
UPort™ 407: 2300 mA @ 12 VDC, 1130 mA @ 24 VDC, 790 mA @ 36 VDC

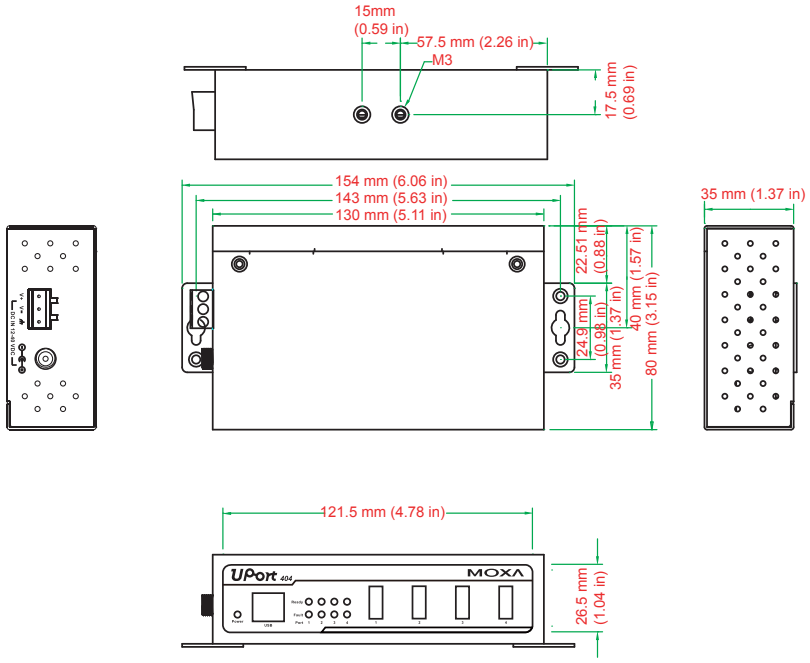
Warranty

Warranty Period: 5 years

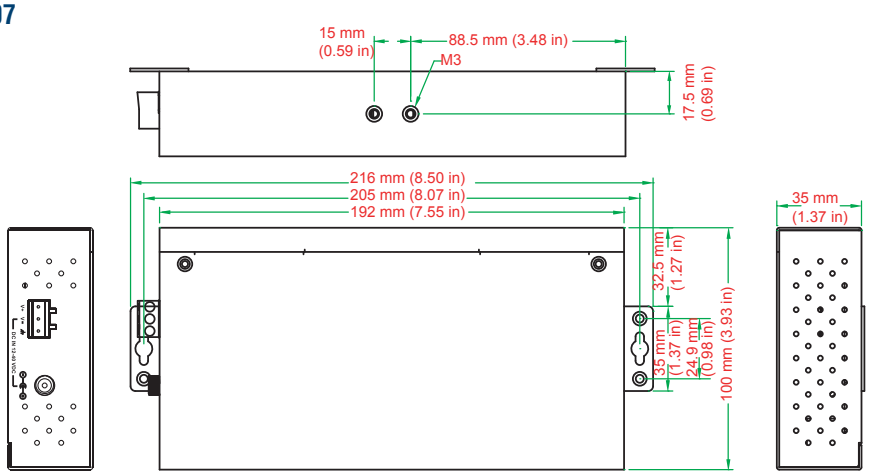
Details: See www.moxa.com/warranty

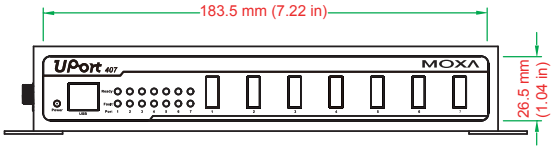
Dimensions

UPort™ 404



UPort™ 407





Ordering Information

Available Models

UPort™ 404: 4-port industrial USB hub, adaptor included, 0 to 60°C operating temperature
UPort™ 407: 7-port industrial USB hub, adaptor included, 0 to 60°C operating temperature
UPort™ 404-T: 4-port industrial USB hub, -40 to 85°C operating temperature
UPort™ 407-T: 7-port industrial USB hub, -40 to 85°C operating temperature

Optional Accessories (can be purchased separately)

Wall Mount Kit: Metal plates and screws
DK-35A: Mounting Kit for 35-mm DIN-Rail
Din-Rail Kit: Din-Rail kit for the UPort™ 400 Series

Package Checklist

- UPort™ 404 or UPort™ 407 industrial-grade USB hub
- USB-IF certified cable
- Power adaptor (0 to 60°C operating temp. models only)
- Quick Installation Guide (printed)
- Warranty Card

UPort™ 204/207

4 and 7-port entry-level USB hubs

- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- USB-IF Certification
- Compatible with USB 1.1 devices
- 15 KV ESD Level 4 protection for all USB ports
- Wall mountable
- Comprehensive diagnostic LEDs
- Full 500 mA of power per port
- Choose bus power or external power (UPort™ 204 only)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The UPort™ 204 and UPort™ 207 are entry-level USB 2.0 hubs that expand 1 USB port into 4 and 7 USB ports, respectively. The hubs are designed to provide true USB 2.0 Hi-Speed 480 Mbps data transmission through each port, even for heavy-load applications. The UPort™ 204/207 have received USB-IF Hi-Speed certification, which is an indication that both products are reliable, high quality USB 2.0 hubs. In addition, the hubs are fully compliant with the USB Plug & Play spec and provide a full 500 mA of power per port, ensuring that your USB devices will function properly. The UPort™ 204/207 hubs' support of 12-40 VDC power makes them ideal for mobile applications. Externally powered USB hubs are the only way to guarantee the broadest compatibility with USB devices.

USB-IF Certification

The UPort™ 204/207 USB 2.0 entry-level USB hubs have passed USB-IF (USB Implementers Forum) certification. USB-IF verifies a number of strict electrical requirements for the Hi-Speed USB operation of USB hubs designed to the USB 2.0 specification. This means that the UPort™ 204/207 support Hi-Speed USB 2.0 for up to 480 Mbps USB transmission, which is fully compliant with interoperability requirements, is enough power for devices to function, and provides for a successful transition back to high-speed operation from the suspend state.

ESD Level 4 Protection

Electrostatic discharge (ESD) could be as severe as having more than one thousand volts of ESD with a high rise time (dv/dt) break through the junction layer of protective devices. In order to avoid serious damage, Moxa's UPort™ 204/207 USB hubs provide ESD level 4 (contact 8 KV, air 15 KV) protection, which increases the quality and value of the user's end-product.

Specifications

USB Interface

Compliance: USB 1.1/2.0 compliant

Upstream: 1 USB port, Type B connector

Downstream:
UPort™ 204: 4 USB ports, Type A connectors
UPort™ 207: 7 USB ports, Type A connectors

Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Supply Current: 500 mA max. per channel

Physical Characteristics

Housing: Polycarbonate (PC)

Dimensions:
UPort™ 204: 70 x 35 x 120 mm (2.76 x 1.38 x 4.72 in)
UPort™ 207: 80 x 35 x 185 mm (3.15 x 1.38 x 4.72 in)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 75°C (-4 to 167°F)

Regulatory Approvals: EN61000-3-2, EN61000-3-3, EN61000-4-2,EN61000-4-3,EN61000-4-4,EN61000-4-5,EN61000-4-6,EN61000-4-8, EN61000-4-11,EN61000-6-2, EN61000-6-4, FCC Part 15 Class A, UL508, LVD

Input Voltage: 12 to 40 VDC external power

Power Consumption:
UPort™ 204: 1210 mA @ 12 VDC, 610 mA @ 24 VDC, 430 mA @ 36 VDC
UPort™ 207: 2170 mA @ 12 VDC, 1070 mA @ 24 VDC, 730 mA @ 36 VDC

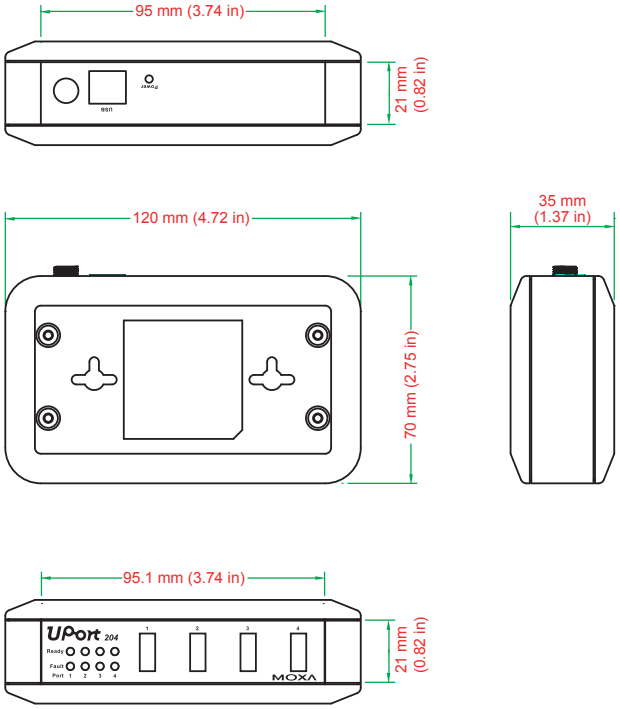
Warranty

Warranty Period: 5 years

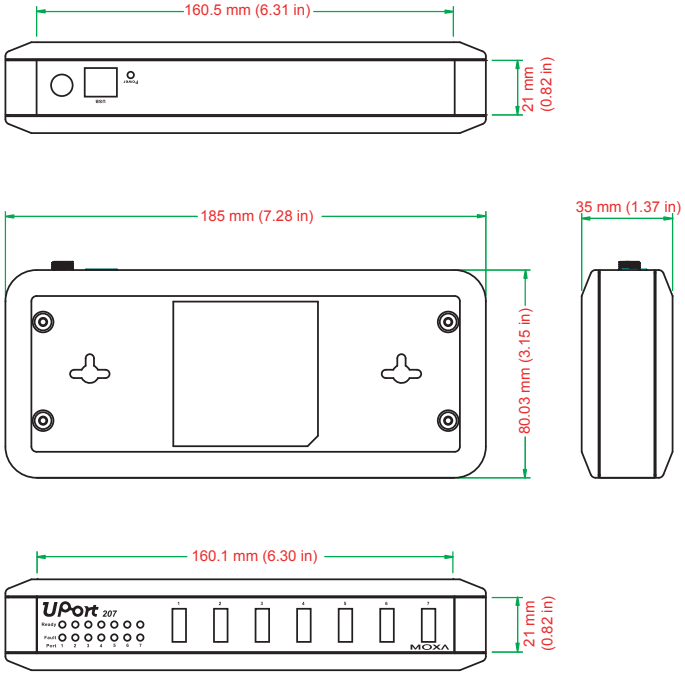
Details: See www.moxa.com/warranty

Dimensions

UPort™ 204



UPort™ 207



Ordering Information

Available Models

UPort™ 204: 4-port entry-level USB hub, adaptor included
UPort™ 207: 7-port entry-level USB hub, adaptor included

Package Checklist

- UPort™ 204 or UPort ™ 207 entry-level USB hub
- USB-IF certified cable
- Power adaptor
- Quick Installation Guide (printed)
- Warranty Card

Media Converters

Product Selection Guides

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Rackmount Chassis Converters

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Standalone Series

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Chassis Media Converters

	TRC-190-AC TRC-190-DC	TCF-142-M-SC-RM TCF-142-M-ST-RM	TCF-142-S-SC-RM TCF-142-S-ST-RM
Optical Fiber Side			
Fiber Connector	---	SC or ST	SC or ST
Cables Requirements	---	50/125, 62.5/125, or 100/140 µm	8.3/125, 8.7/125, 9/125, or 10/125 µm
Transmission Distance	---	5 km	40 km
Wavelength	---	850 nm	1310 nm
Tx Output	---	> -5 dBm	> -5 dBm
Rx Sensitivity	---	-20 dBm	-25 dBm
Point-to-Point Transmission	---	Point-to-Point Transmission: Half-duplex or full-duplex	Point-to-Point Transmission: Half-duplex or full-duplex
RS-232/422/485 Side			
Connector	---	Terminal Block	
RS-232 Signals	---	TxD, RxD, SGND	
RS-422 Signals	---	TxD+, TxD-, RxD+, RxD-, SGND	
RS-485-4w Signals	---	TxD+, TxD-, RxD+, RxD-, SGND	
RS-485-2w Signals	---	Data+, Data-, SGND	
Baudrate	---	50 bps to 921.6 Kbps	
ESD Protection	---	15 KV	15 KV
Physical Characteristics			
Housing	SECC (1.2 mm)	SPCC	SPCC
Dimensions (mm)	440 x 260 x 77 mm	86.8 x 136.5 x 21 mm	86.8 x 136.5 x 21 mm
Weight	5.2 kg (11.4 lbs), with one power module installed	---	---
Installation	---	---	---
Number of Slots	19 slots in the front for slide-in modules, 2 slots in the back for power supply modules	---	---
Environmental Limits			
Operating Temperature	0 to 60°C	0 to 60°C	0 to 60°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 75°C	-20 to 75°C	-20 to 75°C
Power Requirements			
Input Voltage	Universal 100 to 240 VAC (47 to 63 Hz)	12 VDC	12 VDC
Power Consumption	5.4 A @ 12 V (max. output) or 12 to 48 VDC	150 mA @ 12 V	150 mA @ 12 V
Regulatory Approvals			
CE	Class B	Class B	
FCC	Part 15 sub part B Class A	Part 15 sub part B Class A	
EMI	EN55022 1998, Class B	---	---
EMS	EN61000-4-2 (ESD), Criteria A, Level 4 EN61000-4-3 (RS), Criteria A, Level 2 EN61000-4-4 (EFT), Criteria A, Level 3 EN61000-4-5 (Surge), Criteria A, Level 3 EN61000-4-6 (CS), Criteria A, Level 2 EN61000-4-8 (PFMF), Criteria A, Level 3 EN61000-4-11 (DIPS), Criteria A	EN61000-4-2 (ESD), Criteria A, Level 4 EN61000-4-3 (RS), Criteria A, Level 2 EN61000-4-4 (EFT), Criteria A, Level 3 EN61000-4-5 (Surge), Criteria A, Level 3 EN61000-4-6 (CS), Criteria A, Level 2 EN61000-4-8 (PFMF), Criteria A, Level 3	
Freefall	---	IEC 60068-2-32	
Reliability			
Warranty	5 years (see www.moxa.com/warranty)		

Serial-to-Fiber Media Converters

	ICF-1150-M-SC/ST ICF-1150-M-SC/ST-T	ICF-1150I-M-SC/ST ICF-1150I-M-SC/ST-T	ICF-1150-S-SC/ST ICF-1150-S-SC/ST-T	ICF-1150I-S-SC/ST ICF-1150I-S-SC/ST-T	TCF-142-M-SC/ST TCF-142-M-SC/ST-T	TCF-142-S-SC/ST TCF-142-S-SC/ST-T	TCF-90-M/S
Optical Fiber Side							
Fiber Connector	SC or ST	SC or ST	SC or ST		SC or ST	SC or ST	ST
Cables Requirements	Single-mode: 8.3/125, 8.7/125, 9/125, or 10/125 µm Multi-mode: 50/125, 62.5/125, or 100/140 µm						
Transmission Distance	Single-mode: 40 km Multi-mode: 5 km						
Wavelength	Single-mode: 1310 nm Multi-mode: 850 nm						
Tx Output	Single-mode: > -5 dBm Multi-mode: > -5 dBm						
Rx Sensitivity	Single-mode: -25 dBm Multi-mode: -20 dBm						
Point-to-Point Transmission	Half-duplex or full-duplex						---
Multi-drop Transmission	Half-duplex, fiber ring						---
Ring Transmission	---	---	---	---	Half-duplex		---
RS-232 Side							
Connector	---	---	---	---	---	---	DB9 female
Signals	---	---	---	---	---	---	Tx, Rx, GND (Loop-back wiring: RTS to CTS, DTR to DSR and DCD)
Baudrate	---	---	---	---	---	---	300 bps to 115.2 Kbps
RS-232/422/485 Side							
Connector	---	---	---	---	Terminal Block		---
RS-232 Signals	TxD, RxD, SGND						---
RS-422 Signals	TxD+, TxD-, RxD+, RxD-, SGND						---
RS-485-4w Signals	TxD+, TxD-, RxD+, RxD-, SGND						---
RS-485-2w Signals	Data+, Data-, SGND						---
Baudrate	50 bps to 921.6 Kbps						---
ESD Protection	15 KV for all signals						---
Isolation	2 KV RMS isolation per I/O port for 1 minute				---	---	---
Physical Characteristics							
Housing	Aluminum (1 mm)						ABS + PC
Dimensions (mm)	30.3 x 70 x 115				67 x 100 x 22 mm		42 x 80 x 22 mm
Environmental Limits							
Operating Temperature	0 to 60°C or -40 to 85°C						0 to 60°C
Operating Humidity	5 to 95% RH						5 to 95% RH
Storage Temperature	-40 to 85°C						-20 to 75°C
Power Requirements							
Source of Input Power	---	---	---	---	---	---	RS-232 port (TxD signal) or power input jack
Input Voltage	12 to 48 VDC				12 to 48 VDC		12 to 48 VDC
Power Consumption	127 mA @ 12 V	163 mA @ 12 V			140 mA @ 12 V		20 mA @ 5 V (with termination disabled)
Burst Protection (EFT)	4 KV				2 KV		---
Surge Protection	2 KV				2 KV		---
Voltage Reversal Protection	Protects against V+/V- reversal				Protects against V+/V- reversal		---
Over Current Protection	1.1 A				1.1 A		---
Regulatory Approvals							
CE	Class B				---	---	Class B
FCC	Part 15 sub Class B				Part 15 Subclass B		Class B
Safety	UL 508				---	---	---
UL/CUL	---				UL60950-1		---
EMI	EN55022 1998, Class B				EN55022 1998, Class B		---
EMS	EN61000-4-2 (ESD), Criteria A, Level 4 EN61000-4-3 (RS), Criteria A, Level 3 EN61000-4-4 (EFT), Criteria A, Level 4 EN61000-4-5 (Surge), Criteria A, Level 3 EN61000-4-6 (CS), Criteria A, Level 3 EN61000-4-8 (PFMF), Criteria A, Level 5				EN61000-4-2 (ESD), Criteria A, Level 3 EN61000-4-3 (RS), Criteria A, Level 2 EN61000-4-4 (EFT), Criteria A, Level 2 EN61000-4-5 (Surge), Criteria A, Level 3 EN61000-4-6 (CS), Criteria A, Level 2 EN61000-4-8 (SFMF), Criteria A, Level 1		---
ATEX	Class 1, Zone 2, EEx nC IIC (pending)				---	---	---
Hazardous Location	UL/cUL Class 1, Div. 2, Group A, B, C and D (Pending)				---	---	---
TÜV	EN 60950-1				EN60950-1		---
Freefall	IEC 60068-2-32				---	---	---
Water and Dust Proof	IP30				---	---	---
Reliability							
Warranty	5 years (see www.moxa.com/warranty)						

Serial Converters and Repeaters

	TCC-100 TCC-100-T	TCC-100I TCC-100I-T	TCC-80	TCC-80I	TCC-120	TCC-120I	TCC-82
RS-232 Side							
Connector	DB9 female		DB9 female		---	---	---
Signals	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND		TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND (Loop-back wiring: RTS to CTS, DTR to DSR and DCD)		---	---	---
RS-422/485 Side							
Connector	Terminal Block		Terminal Block or DB9 male		---	---	---
Signals	(interface selected by DIP switch) RS-422: TxD+, TxD-, RxD+, RxD-, GND RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND RS-485-2w Signals: Data+, Data-, GND		(interface selected by DIP switch) RS-422: TxD+, TxD-, RxD+, RxD-, GND RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND RS-485-2w Signals: Data+, Data-, GND		---	---	---
RS-485 Data Direction Control	---	---	ADDC®		---	---	---
Serial Communication							
Connectors	---	---	---	---	Terminal Block on both ends		DB9 male/female
Baudrate	50 bps to 921.6 Kbps		50 bps to 921.6 Kbps		50 bps to 921.6 Kbps		50 bps to 921.6 Kbps
Signals	---	---	---	---	RS-422/485-4w: TxD+, TxD-, RxD+, RxD- RS-485-2w: Data+, Data-		RS-232: TxD, RxD, RTS, CTS (Loop-back wiring: DTR to DSR and DCD)
RS-485 Data Direction Control	---	---	---	---	ADDC®		
Pull High Resistance Pull Low Resistance	150K ohm or 1K ohm (default)						
ESD Protection	15 KV		15 KV		15 KV for all signals		15 KV for all signals
Optical Isolation	---	2 KV	---	2.5 KV rms for 1 minute	---	2 KV for power and signal	4 KV for 1 minute
Physical Characteristics							
Housing	Aluminum		ABS + PC		Aluminum		ABS
Dimensions (mm)	67 x 100.4 x 22 mm		42 x 80 x 22 mm		67 x 100.4 x 22 mm		42 x 80 x 23.6 mm
Weight	148 ± 5 g		50 ± 5 g		148 ± 5 g		60 ± 5 g
Environmental Limits							
Operating Temperature	-20 to 60°C, or -40 to 85°C		0 to 60°C		-20 to 60°C		0 to 60°C
Operating Humidity	5 to 95% RH		5 to 95% RH		5 to 95% RH		5 to 95% RH
Storage Temperature	-20 to 85°C		-20 to 75°C		-20 to 85°C		-20 to 75°C
Power Requirements							
Source of Input Power	Power input jack		RS-232 port (TxD, RTS, DTR) or power input jack		RS-232 port (TxD signal) or power input jack		RS-232 port (TxD signal) or power input jack
Input Voltage	12 to 48 VDC		5 to 12 VDC		12 to 48 VDC		5 to 12 VDC
Power Consumption	300 mA @ 12 V	400 mA @ 12 V	10 mA @ 5 V (with termination disabled)	20 mA @ 5 V (with termination disabled)	98 mA @ 12 V, 1.18 W	234 mA @ 12 V, 2.81 W	20 mA @ 5 V
Connection	---	---	---	---	---	---	---
Overload Current Protection	---	---	---	---	---	---	---
Reverse Polarity Protection	---	---	---	---	---	---	---
Burst Protection (EFT)	---	---	---	---	---	---	---
Surge Protection	---	---	---	---	---	---	---
Voltage Reversal Protection	Protects against V+/V- reversal		---	---	Protects against V+/V- reversal		---
Over Current Protection	√	√	---	---	√	√	---
Regulatory Approvals							
CE	Class B		Class B		Class B		Class B
FCC	Class B		Class B		Class B		Class B
Reliability							
Warranty	5 years (see www.moxa.com/warranty)						

Ethernet-to-Fiber Media Converters

	IMC-101G INC-101G-T	IMC-101-M-SC/ST IMC-101-M-SC/ST-T	IMC-101-S-SC IMC-101-S-SC-T	IMC-101-S-SC-80 IMC-101-S-SC-80-T	IMC-21-M-SC/ST	IMC-21-S-SC
IEEE Standards						
IEEE 802.3	√	√	√	√	√	√
IEEE 802.3u	√	√	√	√	√	√
IEEE 802.3ab	√	---	---	---	---	---
IEEE 802.3z	√	---	---	---	---	---
IEEE 802.3x	---	---	---	---	√	√
Interface						
RJ45 Ports	10/100/1000BaseT(X)	10/100BaseT(X)			10/100BaseT(X)	
Fiber Ports	Optional 1000BaseSX/LX/LHX/ZX (LC connector)	100BaseFX (SC or ST connectors)			100BaseFX (SC or ST)	
LED Indicators	PWR1, PWR2, FAULT, 10/100M (TP port), 1000M (TP and Fiber port)	PWR1, PWR2, FAULT, 10/100M (TP port), 100M (Fiber port), FDX/COL (Fiber port)			Power, 10/100M (TP port), 100M (fiber port), FDX/COL (fiber port)	
DIP Switches	Port break alarm mask Fault Pass-Through Fiber AN/Force	100BaseFX Full/Half duplex selection, port break alarm mask			TP port's 10/100M, Half/Full modes, and Force/Auto modes, fiber connection's Full/Half mode, Link Fault Pass-Through (LFP)	
Alarm Contact	One relay output with current carrying capacity of 1 A @ 24 VDC	One relay output with current carrying capacity of 1A @ 24 VDC			---	---
Multi-mode Transmission Distance						
1000BaseSX	• 0 to 500 m, 850 nm (50/125 µm, 400 MHz*km) • 0 to 275 m, 850 nm (62.5/125 µm, 200 MHz*km)	---	---	---	---	---
1000BaseLX	• 0 to 1100 m, 1310 nm (50/125 µm, 800 MHz*km) • 0 to 550 m, 1310 nm (62.5/125 µm, 500 MHz*km)	---	---	---	---	---
Single-mode Transmission Distance						
1000BaseLX	0 to 10 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))				---	---
1000BaseLHX	0 to 40 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))				---	---
1000BaseZX	0 to 80 km, 1550 nm (9/125 µm, 19 PS/(nm*km))				---	---
Physical Characteristics						
Housing	Metal (IP30)	Metal (IP30)			Plastic (IP30)	
Dimensions (mm)	53.6 x 135 x 105 mm	53.6 x 135 x 105 mm			25 x 109 x 97 mm	
Weight	630 g	630 g			125 g	
Installation	DIN-Rail mounting, wall mounting (with optional kit)				DIN-Rail mounting	
Environmental Limits						
Operating Temperature	0 to 60°C or -40 to 75°C				0 to 60°C	
Operating Humidity	5 to 95% RH				5 to 95% RH	
Storage Temperature	-40 to 85°C				-40 to 70°C	
Power Requirements						
Input Voltage	24 VDC (12 to 45 VDC), redundant inputs				12 to 45 VDC, 18 to 30 VAC (47-63 Hz)	
Input Current	0.11A (@ 24 V)	0.16A (@ 24 V)			0.15 A (@ 24 V)	
Connection	Removable terminal block				Removable 3-contact terminal block	
Overload Current Protection	1.1 A				1.1 A	
Reverse Polarity Protection	√	√	√	√	√	√
Regulatory Approvals						
Safety	UL508	UL508 UL60950-1 CSA C22.2 No. 60950-1 EN60950-1			UL508 UL60950-1 CSA C22.2 No. 60950-1 EN60950-1	
EMI	FCC Part 15, CISPR (EN55022) class A				FCC Part 15, CISPR (EN55022) class A	
EMS	EN61000-4-2 (ESD), level 3 EN61000-4-3 (RS), level 3 EN61000-4-4 (EFT), level 3 EN61000-4-5 (Surge), level 3 EN61000-4-6 (CS), level 3 EN61000-4-8 EN61000-4-11				EN61000-4-2 (ESD) EN61000-4-3 (RS) EN61000-4-4 (EFT) EN61000-4-5 (Surge) EN61000-4-6 (CS)	
Hazardous Location	---	UL/cUL Class1, Division 2, Groups A, B, C, and D, ATEX Class1, Zone 2, Ex nC IIC (IMC-101-M-ST, IMC-101-S-SC-80 pending)			---	---
Freefall	IEC60068-2-32				IEC60068-2-32	
Shock	IEC60068-2-27				IEC60068-2-27	
Vibration	IEC60068-2-6				IEC60068-2-6	
Maritime	---	DNV, GL			---	---
MTBF	500,000 hrs	401,000 hrs			353,000 hrs	
Reliability						
Warranty	5 years (see www.moxa.com/warranty)					

Introduction to the NRack System™

Rackmount chassis converter solutions

Fiber converters have been widely used in FTTH, FTTP, and even transportation automation, power system automation, as well as many other automation systems. The main reason is because fiber optic communication has ESD immunity, wide bandwidth, zero data loss, and can transmit data over a much longer distance compared to wire cabling.

Media converters are generally used in a pair connection. That is, two media converters are used in tandem, with one converter located at the control center, and the other converter located at a remote site. This is the ideal setup from a central management point of view, in which all data is transmitted back to the control center for processing in a central computing system. For systems that require many media converters at the central site, system integrators must determine how and where to mount the converters and how to arrange power supplies.

Chassis-type media converters are a perfect choice for systems that require installing several converters in a confined space. Moxa's NRack System™ is designed to help customers who are faced with the challenge of installing a high density media converter system. The NRack System™ saves time since less mounting is required, and the power input wiring problem is much easier to handle.

An NRack System™ consists of 3 major components: Rackmount Chassis, Slide-in Modules, and Power Supply Modules. Installing the power supply module in the chassis can save quite a bit of space since you do not need to deal with numerous power adaptors connecting to the various converters installed in your control center. Two main types of slide-in modules are available. One type handles data transmission only, whereas the other type is used to manage the entire chassis system.

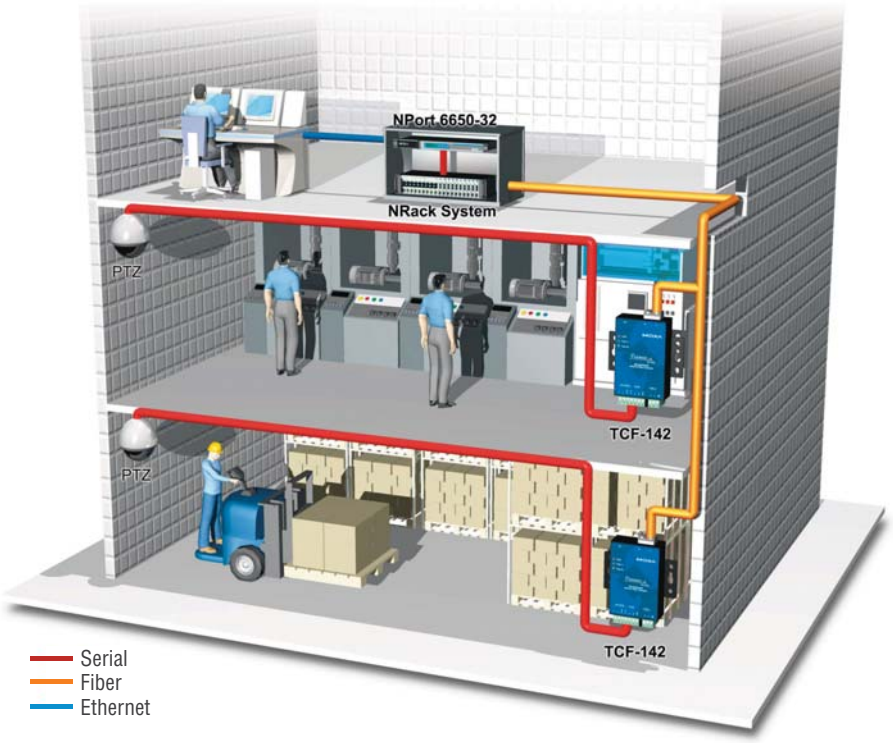
Applications

Serial-to-Fiber Converter for Surveillance Systems in Factories

Thanks to optical fiber's capability for super fast, secure data transmission, Moxa's NRack System™ can be used to control a PTZ camera's zoom-in/zoom-out motion. Take complete control of your building's security system by monitoring and manipulating all of your video cameras, from a distance.

Benefits:

- Extended distance between computers and remote PTZ cameras
- Zero data loss from electromagnetic interference
- Simple wiring
- High density solution saves space and wiring costs



TRC-190 Series

Rackmount chassis for the NRack System™

- 19-inch chassis for rackmount use
- 19 slots for high density applications
- Supports hot-swap and dual power input with redundancy
- Fan-less chassis design reduces repair time

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The TRC-190 series provides 19 slots for media converter modules such as the TCF-142-RM series. A TRC-190 chassis comes with one AC or DC power input, with an optional redundant power expansion module available for greater reliability. The TRC-190 series' power input module supports the hot-swap feature.

Specifications

Physical Characteristics

Housing: SECC (1.2 mm)

Dimensions: 440 x 260 x 77 mm (18.6 x 11 x 3.3 in)

Weight: 5.2 kg (11.4 lbs), with one power module installed

Number of Slots: 19 slots in the front for slide-in modules, 2 slots in the back for power supply modules

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 75°C (-4 to 158°F)

Power Requirements

Input Voltage: Universal 100 to 240 VAC (47 to 63 Hz) or 12 to 48 VDC

Power Consumption:
Max. Output: 5.4 A @ 12 V

Regulatory Approvals

CE: Class A

FCC: Part 15 sub part B Class A

EMI: EN55022 2006, Class B

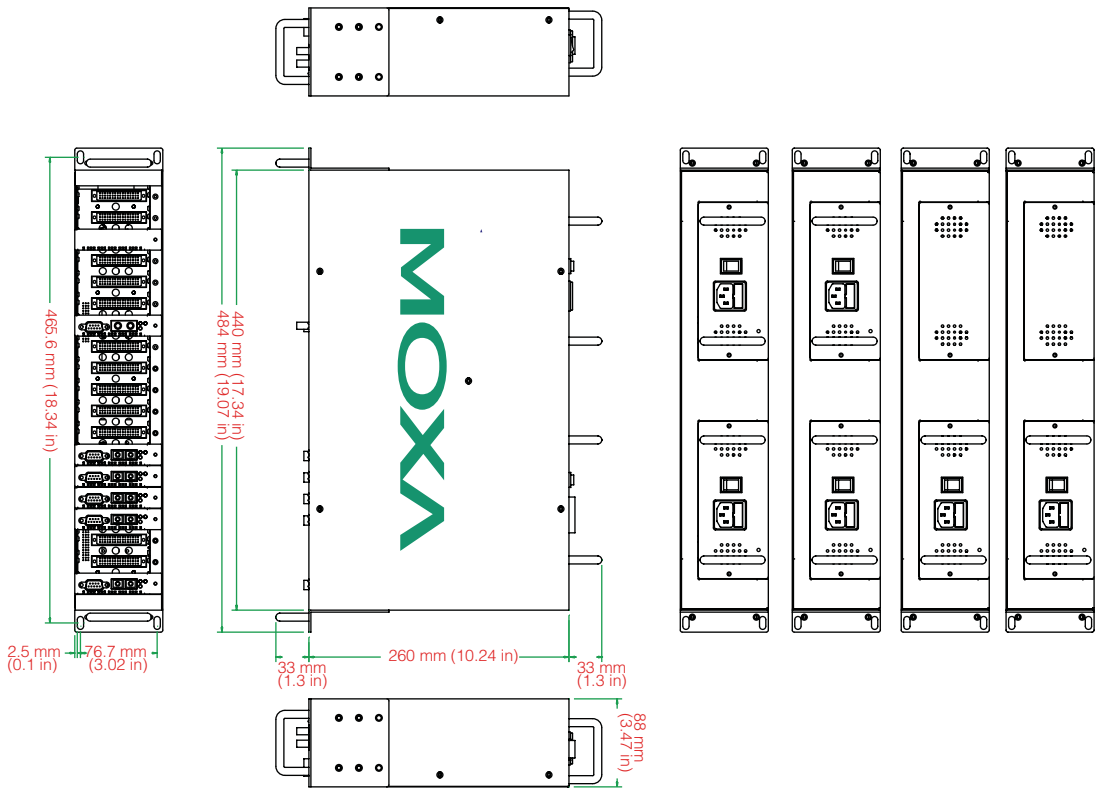
EMS:
EN61000-4-2 (ESD), Criteria A, Level 4
EN61000-4-3 (RS), Criteria A, Level 2
EN61000-4-4 (EFT), Criteria A, Level 3
EN61000-4-5 (Surge), Criteria A, Level 3
EN61000-4-6 (CS), Criteria A, Level 2
EN61000-4-8 (PFMF), Criteria A, Level 3
EN61000-4-11 (DIPS), Criteria A

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Available Models

TRC-190-AC: Rack chassis, 2U, single 110 to 240 VAC input, with 19 slots on front panel

TRC-190-DC: Rack chassis, 2U, single 12 to 48 VDC input, with 19 slots on front panel (coming soon)

Optional Accessories (can be purchased separately)

PWR-190-AC: Redundant power supply, 110 to 240 VAC

PWR-190-DC: Redundant power supply, 12 to 48 VDC (coming soon)

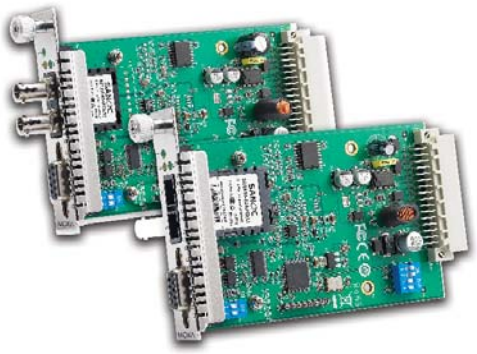
Plate-1: Face plate to cover unused front panel slots (required for all unused slots)

Package Checklist

- TRC-190 with single power input
- Power cord (for TRC-190-AC only)
- 18 face plates
- User's Manual (printed)
- Warranty Card

TCF-142-RM Series

RS-232/422/485 to fiber slide-in modules for the NRack System™



- Extend RS-232/422/485 transmission up to:
  - 40 km with single mode
  - 5 km with multi-mode
- 1K or 150K ohm adjustable pull high/low resistor
- "Ring" and "Point-to-Point" transmission supported

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The TCF-142-RM series of serial-to-fiber converters are slide-in modules that work with the TRC-190 chassis. The modules convert from the RS-232, RS-422, or RS-485 signal to a fiber optic signal.

Automatic Baudrate Detection

The TCF-142-RM series can automatically detect the serial baudrate. This is an extremely convenient feature. Even if a device's baudrate is changed, the signal will still be transmitted through the media converter without any problem.

Specifications

Optical Fiber Side

Fiber Connector: SC or ST

Cable Requirements:
Single-mode: 8.3/125, 8.7/125, 9/125, or 10/125 µm
Multi-mode: 50/125, 62.5/125, or 100/140 µm

Transmission Distance:
Single-mode: 40 km
Multi-mode: 5 km

Wavelength:
Single-mode: 1310 nm
Multi-mode: 850 nm

Tx Output:
Single-mode: > -5 dBm
Multi-mode: > -5 dBm

Rx Sensitivity:
Single-mode: -25 dBm
Multi-mode: -20 dBm

Point-to-Point Transmission: Half-duplex or full-duplex

RS-232/422/485 Side

Terminal Block

RS-232 Signals: TxD, RxD, SGND

RS-422 Signals: TxD+, TxD-, RxD+, RxD-, SGND

RS-485-4w Signals: TxD+, TxD-, RxD+, RxD-, SGND

RS-485-2w Signals: Data+, Data-, SGND

Baudrate: 50 bps to 921.6 Kbps

ESD Protection: 15 KV for all signals

Physical Characteristics

Housing: SPCC

Dimensions: 86.8 x 136.5 x 21 mm (3.42 x 5.37 x 0.83 in)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 75°C (-4 to 158°F)

Power Requirements

Input Voltage: 12 VDC

Power Consumption: 150 mA @ 12 V

Regulatory Approvals

CE: Class A

FCC: Part 15 sub part B Class A

EMS:
EN61000-4-2 (ESD), Criteria A, Level 4
EN61000-4-3 (RS), Criteria A, Level 2
EN61000-4-4 (EFT), Criteria A, Level 3
EN61000-4-5 (Surge), Criteria A, Level 3
EN61000-4-6 (CS), Criteria A, Level 2
EN61000-4-8 (PFMF), Criteria A, Level 3

Freefall: IEC 60068-2-32

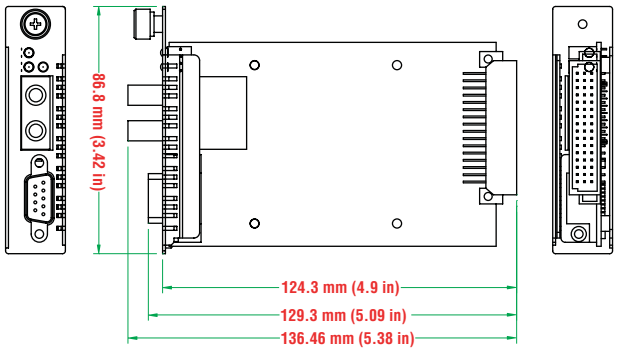
Warranty

Warranty Period: 5 years

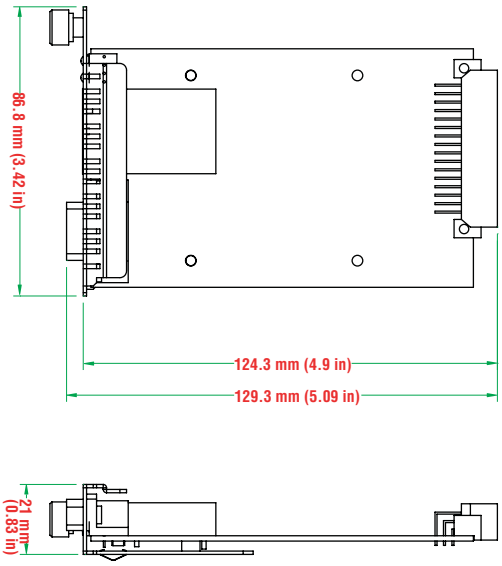
Details: See www.moxa.com/warranty

Dimensions

TCF-142-M/S-ST Series

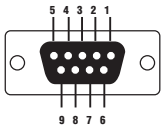


TCF-142-M/S-SC Series



Pin Assignment

DB9 female connector



Pin	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	Tx-	---
2	RxD	Tx+	---
3	TxD	Rx+	Data+
4	DTR	Rx-	Data-
5	GND	GND	GND
6	DSR	---	---
7	RTS	---	---
8	CTS	---	---

Ordering Information

Available Models

TCF-142-M-SC-RM: RS-232/422/485 to multi-mode fiber slide-in module converter, SC connector
TCF-142-M-ST-RM: RS-232/422/485 to multi-mode fiber slide-in module converter, ST connector
TCF-142-S-SC-RM: RS-232/422/485 to single-mode fiber slide-in module converter, SC connector
TCF-142-S-ST-RM: RS-232/422/485 to single-mode fiber slide-in module converter, ST connector

Package Checklist

- TCF-142 series fiber converter
- Quick Installation Guide (printed)
- Warranty Card

ICF-1150 Series

Industrial serial-to-fiber converters

- RS-232, fiber, and RS-422/485 3-way communication
- Rotary switch to change the pull high/low resistor value
- Extend RS-232/422/485 transmission up to:
  - 40 km with single-mode
  - 5 km with multi-mode
- 3-way Galvanic Isolation (for "I" model only)
- -40 to 85°C wide temperature models available
- Class I, Div. II certification (Pending)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Three-Way Communication

The ICF-1150 series support 2 serial ports, with a D-sub connector for RS-232 communication and a removable terminal block for RS-422 or RS-485 communication. The 3 ports (2 serial ports and one fiber port) are completely independent. When an ICF-1150 converter receives data from any one port, it will send the data out through the other 2 ports. For example, once the ICF-1150 converter receives a command from the remote master through the fiber port, it will convert the signal and send the command through the RS-232 and RS-422/485 ports at the same time. If the user is monitoring a system running on an RS-485 network, there is no need to use an additional RS-232 to RS-485 converter to connect the laptop computer's serial port to the RS-485 bus.

Rotary Switch for Setting the Pull High/Low Resistor

The RS-485 interface supports multi-drop or daisy-chain connections, which system engineers will use to connect serial devices such as meters, RTUs, and readers together on the same bus. Since the number of serial devices on the same bus will cause the impedance of the data line to increase, the ICF-1150 allows users to tune the pull high/low resistor. Just rotate the switch to the appropriate value without removing the ICF-1150 from the DIN-rail.

Pull High/Low Resistor Values

Position	0	1	2	3	4	5	6	7	8	9
ohms	150K	10K	4.7K	3.3K	1K	909	822	770	500	485

Specifications

Optical Fiber Side

Fiber Connector: SC or ST

Cable Requirements:
Single-mode: 8.3/125, 8.7/125, 9/125, or 10/125 µm
Multi-mode: 50/125, 62.5/125, or 100/140 µm

Transmission Distance:
Single-mode: 40 km
Multi-mode: 5 km

Wavelength:
ICF-1150-S (single-mode): 1310 nm
ICF-1150-M (multi-mode): 850 nm

Tx Output:
ICF-1150-S (single-mode): > -5 dBm
ICF-1150-M (multi-mode): > -5 dBm

Rx Sensitivity:
ICF-1150-S (single-mode): -25 dBm
ICF-1150-M (multi-mode): -20 dBm

Point-to-Point Transmission: Half-duplex or full-duplex

Multi-drop Transmission: Half-duplex, fiber ring

RS-232/422/485 Side

RS-232 Signals: TxD, RxD, SGND

RS-422 Signals: TxD+, TxD-, RxD+, RxD-, SGND

RS-485-4w Signals: TxD+, TxD-, RxD+, RxD-, SGND

RS-485-2w Signals: Data+, Data-, SGND

Baudrate: 50 bps to 921.6 Kbps

ESD Protection: 15 KV for all signals

Isolation: 2 KV RMS isolation per I/O port for 1 minute

Physical Characteristics

Housing: Aluminum (1 mm)

Dimensions: 30.3 x 70 x 115 mm (11.9 x 27.6 x 45.3 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
ICF-1150: 127 mA @ 12 V
ICF-1150I: 163 mA @ 12 V

Voltage Reversal Protection: Protects against V+/V- reversal

Over Current Protection: 1.1 A (protects against two signals shorted together)

Regulatory Approvals

CE: Class B

FCC: Part 15 sub Class B

Safety: UL 508

EMI: EN55022 2006, Class B

EMS:
EN61000-4-2 (ESD), Criteria A, Level 4
EN61000-4-3 (RS), Criteria A, Level 2
EN61000-4-4 (EFT), Criteria A, Level 4
EN61000-4-5 (Surge), Criteria A, Level 3
EN61000-4-6 (CS), Criteria A, Level 2
EN61000-4-8 (PFMF), Criteria A, Level 3

ATEX: Class 1, Zone 2, EEx nC IIC (pending)

Hazardous Location: UL/cUL Class 1, Div. 2, Group A, B, C and D (Pending)

Freefall: IEC 60068-2-32

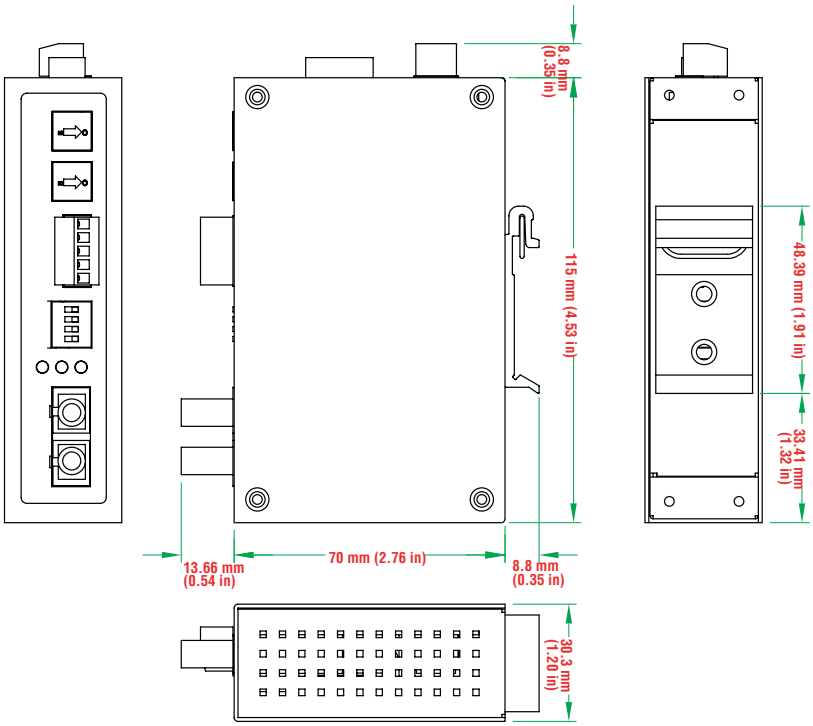
Water and Dust Proof: IP30

Warranty

Warranty Period: 5 years

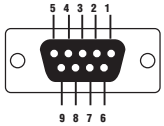
Details: See www.moxa.com/warranty

Dimensions



Pin Assignment

DB9 female connector



Pin	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	GND	GND
2	RxD	Rx-	Data-
3	TxD	Rx+	Data+
4	DTR	Tx-	---
5	GND	Tx+	---
6	DSR	---	---
7	RTS	---	---
8	CTS	---	---

Ordering Information

Available Models

ICF-1150-M-SC: Industrial RS-232/422/485 to multimode fiber converter, SC connector, 0 to 60°C operating temperature
ICF-1150-M-ST: Industrial RS-232/422/485 to multimode fiber converter, ST connector, 0 to 60°C operating temperature
ICF-1150-S-SC: Industrial RS-232/422/485 to single mode fiber converter, SC connector, 0 to 60°C operating temperature
ICF-1150-S-ST: Industrial RS-232/422/485 to single mode fiber converter, ST connector, 0 to 60°C operating temperature
ICF-1150I-M-SC: Industrial RS-232/422/485 to multimode fiber converter, SC connector, 2 KV isolation, 0 to 60°C operating temperature
ICF-1150I-M-ST: Industrial RS-232/422/485 to multimode fiber converter, ST connector, 2 KV isolation, 0 to 60°C operating temperature
ICF-1150I-S-SC: Industrial RS-232/422/485 to single mode fiber converter, SC connector, 2 KV isolation, 0 to 60°C operating temperature
ICF-1150I-S-ST: Industrial RS-232/422/485 to single mode fiber converter, ST connector, 2 KV isolation, 0 to 60°C operating temperature
ICF-1150-M-SC-T: Industrial RS-232/422/485 to multimode fiber converter, SC connector, -40 to 85°C operating temperature
ICF-1150-M-ST-T: Industrial RS-232/422/485 to multimode fiber converter, ST connector, -40 to 85°C operating temperature
ICF-1150-S-SC-T: Industrial RS-232/422/485 to single mode fiber converter, SC connector, -40 to 85°C operating temperature
ICF-1150-S-ST-T: Industrial RS-232/422/485 to single mode fiber converter, ST connector, -40 to 85°C operating temperature
ICF-1150I-M-SC-T: Industrial RS-232/422/485 to multimode fiber converter, SC connector, 2 KV isolation, -40 to 85°C operating temperature
ICF-1150I-M-ST-T: Industrial RS-232/422/485 to multimode fiber converter, ST connector, 2 KV isolation, -40 to 85°C operating temperature
ICF-1150I-S-SC-T: Industrial RS-232/422/485 to single mode fiber converter, SC connector, 2 KV isolation, -40 to 85°C operating temperature
ICF-1150I-S-ST-T: Industrial RS-232/422/485 to single mode fiber converter, ST connector, 2 KV isolation, -40 to 85°C operating temperature

Optional Accessories

DR-4524: 45 W, 2 A Din-Rail 24 VDC power supply with universal 85 to 264 VAC input

Package Checklist

- ICF-1150 series fiber converter
- Quick Installation Guide (printed)
- Warranty Card

TCF-142 Series

RS-232/422/485 to optical fiber media converters

TCF-142-S-ST

TCF-142-S-SC

- "Ring" and "Point-to-Point" transmission
- Extends RS-232/422/485 transmission up to:
  - 40 km with single-mode—TCF-142-S
  - 5 km with multi-mode—TCF-142-M
- Compact size
- Decreases signal interference
- Protects against electrical interference and chemical corrosion
- Supports baudrates of 50 bps to 921.6 Kbps
- Wide temperature models available (-40 to 75°C)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

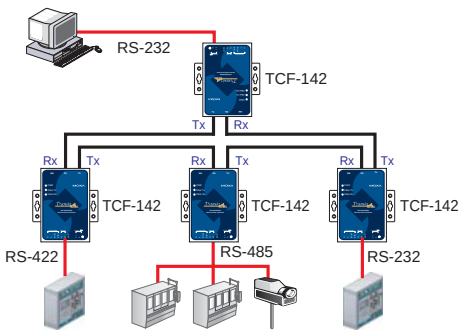
The TCF-142 media converters are equipped with a multiple interface circuit that can handle RS-232 or RS-422/485 serial interfaces and multi-mode or single-mode fiber. TCF-142 converters are used to extend serial transmission up to 5 km (TCF-142-M with multi-mode fiber) or up to 40 km (TCF-142-S with single-mode fiber). The TCF-142 converters can be configured to convert either RS-232 signals, or RS-422/485 signals, but not both at the same time.

Automatic Baudrate Detection

The TCF-142 converters can automatically detect the serial baudrate. This is an extremely convenient feature. Even if a device's baudrate is changed, the signal will still be transmitted through the media converter without any data loss.

Ring Operation

The TCF-142 converters can be used to connect serial devices to a fiber ring. To form the ring, connect the Tx port of one TCF-142 to the Rx port of a neighboring converter. Once the ring is set up, simply use the DIP switches to configure the TCF-142 converters for "ring mode." When one node transmits a signal, the signal travels around the ring until it returns back to the transmitting unit, which then blocks the signal. With the TCF-142, you can set up fiber rings that have a total circumference of up to 100 km.



Automatic Data Direction Control (ADDC®)

ADDC® is a patented hardware data flow solution developed by Moxa to handle RS-485 data direction control. ADDC® senses and controls RS-485 data direction automatically, making it unnecessary to use the hand shaking signal.

Specifications

Optical Fiber Side

Fiber Connector: SC or ST

Cable Requirements:
Single-mode: 8.3/125, 8.7/125, 9/125, or 10/125 µm
Multi-mode: 50/125, 62.5/125, or 100/140 µm

Transmission Distance:
Single-mode: 40 km
Multi-mode: 5 km

Wavelength:
Single-mode: 1310 nm
Multi-mode: 850 nm

Tx Output:
Single-mode: > -5 dBm
Multi-mode: > -5 dBm

Rx Sensitivity:
Single-mode: -25 dBm
Multi-mode: -20 dBm

Point-to-Point Transmission: Half-duplex or full-duplex

Ring Transmission: Half-duplex

RS-232/422/485 Side

Connector: Terminal Block

RS-232 Signals: Tx, Rx, GND

RS-422 Signals: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w Signals: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w Signals: Data+, Data-, GND

Baudrate: 50 bps to 921.6 Kbps

ESD Protection: 15 KV for all signals

Physical Characteristics

Housing: Aluminum (1 mm)

Dimensions:
Without ears: 67 x 100 x 22 mm (2.64 x 3.94 x 0.87 in)
With ears: 90 x 100 x 22 mm (3.54 x 3.94 x 0.87 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 70°C (-4 to 167°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 140 mA @ 12 V

Power Line Protection:
2 KV Burst (EFT), EN61000-4-4
2 KV Surge, EN61000-4-5

Voltage Reversal Protection: Protects against V+/V- reversal

Over Current Protection: 1.1 A (protects against two signals shorted together)

Regulatory Approvals

FCC: Part 15 Subclass B

UL/CUL: UL60950-1

EMI: EN55022 1998, Class B

EMS:
EN61000-4-2 (ESD), Criteria A, Level 3
EN61000-4-3 (RS), Criteria A, Level 2
EN61000-4-4 (EFT), Criteria A, Level 2
EN61000-4-5 (Surge), Criteria A, Level 3
EN61000-4-6 (CS), Criteria A, Level 2
EN61000-4-8 (SFMF), Criteria A, Level 1

TÜV: EN60950-1

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions

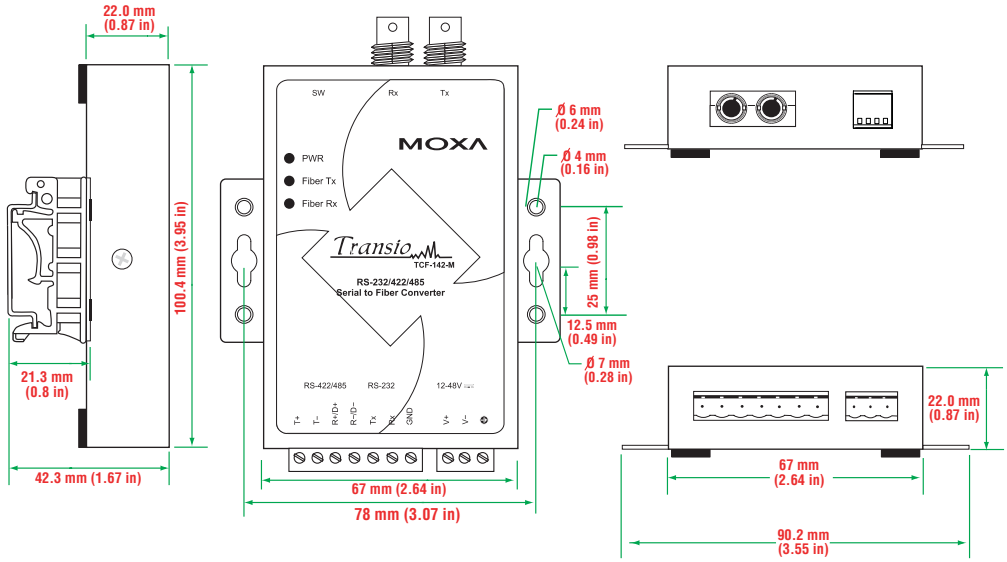
DIP Switch Settings

Serial Connection	SW1	SW2
RS-232	ON	OFF
RS-422	OFF	OFF
RS-485-4w	OFF	OFF
RS-485-2w	OFF	ON

Built-in 120-ohm Terminator	SW3
Enable	ON
Disable	OFF

Fiber Mode	SW4
Ring mode	ON
Point-to-Point mode	OFF

TCF-142-M/S-ST



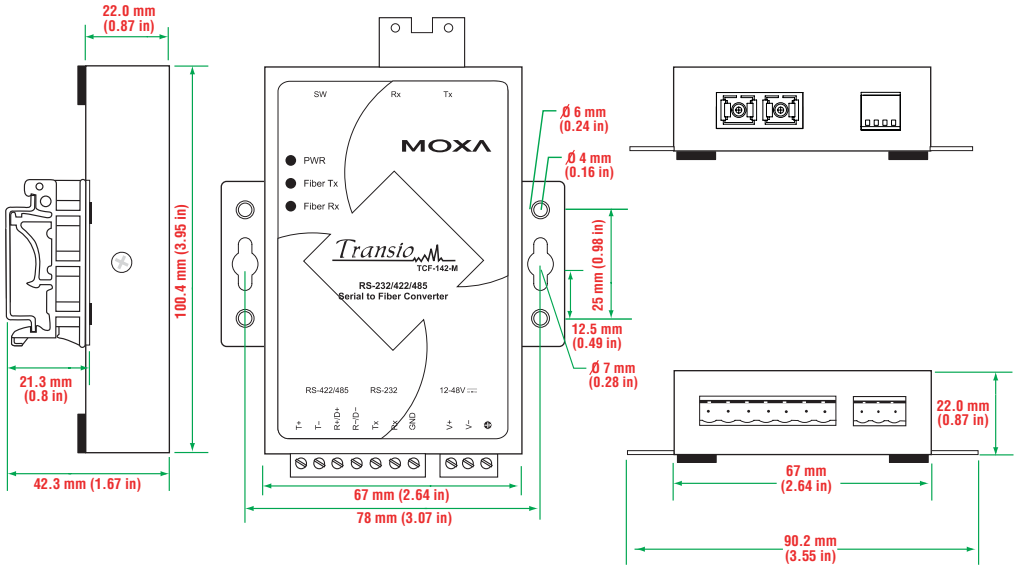
DIP Switch Settings

Serial Connection	SW1	SW2
RS-232	ON	OFF
RS-422	OFF	OFF
RS-485-4w	OFF	OFF
RS-485-2w	OFF	ON

Built-in 120-ohm Terminator	SW3
Enable	ON
Disable	OFF

Fiber Mode	SW4
Ring mode	ON
Point-to-Point mode	OFF

TCF-142-M/S-SC



Ordering Information

Available Models

TCF-142-M-SC: RS-232/422/485 to multi-mode optical fiber media converter with fiber ring support and SC connector, 0 to 60°C operating temperature

TCF-142-M-ST: RS-232/422/485 to multi-mode optical fiber media converter with fiber ring support and ST connector, 0 to 60°C operating temperature

TCF-142-S-SC: RS-232/422/485 to single-mode optical fiber media converter with fiber ring support and SC connector, 0 to 60°C operating temperature

TCF-142-S-ST: RS-232/422/485 to single-mode optical fiber media converter with fiber ring support and ST connector, 0 to 60°C operating temperature

TCF-142-M-SC-T: RS-232/422/485 to multi-mode optical fiber media converter with fiber ring support and SC connector, -40 to 75°C operating temperature

TCF-142-M-ST-T: RS-232/422/485 to multi-mode optical fiber media converter with fiber ring support and ST connector, -40 to 75°C operating temperature

TCF-142-S-SC-T: RS-232/422/485 to single-mode optical fiber media converter with fiber ring support and SC connector, -40 to 75°C operating temperature

TCF-142-S-ST-T: RS-232/422/485 to single-mode optical fiber media converter with fiber ring support and ST connector, -40 to 75°C operating temperature

Package Checklist

- TCF-142 media converter
- Power jack to 3-pin terminal block adaptor
- Quick Installation Guide (printed)
- Warranty Card

TCF-90 Series

Port-powered RS-232 to optical fiber media converters

- Use either external power or power over serial
- Extends RS-232 transmission up to:
  - 40 km with single-mode—TCF-90-S
  - 5 km with multi-mode—TCF-90-M
- Reduces signal interference
- Protects against electrical interference or chemical corrosion
- 15 KV ESD protection for serial signals
- Baudrates up to 115.2 Kbps
- Compact size

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

RoHS | Port Power | USB Power | Ext. Power | 15 KV ESD | CE | FC

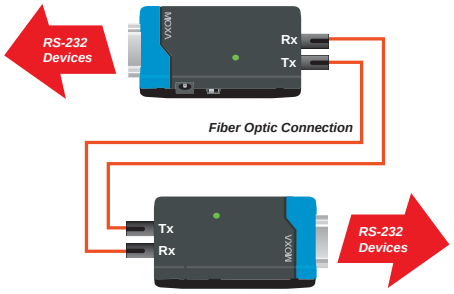
Introduction

The TCF-90 is a compact media converter that transmits RS-232 signals over optical fiber. Power is derived from either the serial port or an external power source. The TCF-90 extends RS-232 transmission up to 5 km with multi-mode fiber, or up to 40 km with single-mode fiber. A pair of TCF-90 converters can be used to connect two RS-232 devices with optical fiber in full duplex mode. The optical fiber isolates the data signals from dangerous increases in ground potential, ground loops, and electrical EMI/RFI noise, and enhances data security by eliminating the harmful effects of RF radiation and susceptibility to electromagnetic radiation.

Self-powered RS-232 to Optical Fiber

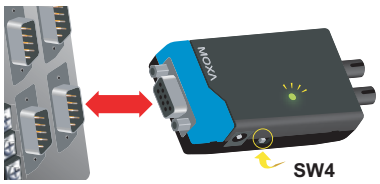
Connecting RS-232 devices to the TCF-90 is easy. The ST-type optical fiber connector is designed especially for data communication applications that transmit data either between or within buildings. The TCF-90 can be used for industrial applications and for applications that require secure data transfer.

The RS-232 port on the TCF-90 uses a DB9 female socket to connect directly to the host PC, with power drawn from the TxD, RTS, and DTR lines. Although the TCF-90 can obtain enough power from the three data/handshake lines whether the signal is high or low, we strongly recommend setting either the RTS or DTR signal to ON.



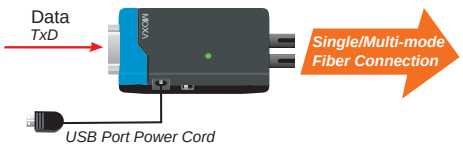
LED Port Power Indicator

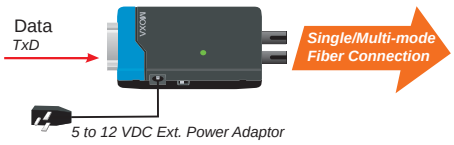
It's easy enough to use a multimeter to test if the serial device is supplying the TCF-90 with enough power through the serial connection, but why bother when the TCF-90 can do the testing for you? Connect the TCF-90 to the device's RS-232 port and set the SW4 switch to Test mode. If the port power LED indicator lights up, the TCF-90 is receiving enough power. If the LED does NOT light up, you will need to attach an external power source to the TCF-90.



Optional External Power Source

In most circumstances, the TCF-90 should be able to operate without using an external power source. However, an external USB power cord or DC power supply can be used in situations where the handshake lines are not available, both the RTS/DTR signals are set to OFF, or the attached device's serial interface chip provides less power than required.





Specifications

Optical Fiber Side

Fiber Connector: ST

Cable Requirements:
Single-mode: 8.3/125, 8.7/125, 9/125, or 10/125 µm
Multi-mode: 50/125, 62.5/125, or 100/140 µm

Transmission Distance:
Single-mode: 40 km
Multi-mode: 5 km

Wavelength:
Single-mode: 1310 nm
Multi-mode: 850 nm

Tx Output:
Single-mode: > -5 dBm
Multi-mode: > -5 dBm

Rx Sensitivity:
Single-mode: -24 dBm
Multi-mode: -20 dBm

RS-232 Side

Connector: DB9 female

Signals:
RS-232 Tx, Rx, GND (Loop-back wiring: RTS to CTS, DTR to DSR and DCD)

Baudrate: 300 bps to 115.2 Kbps

Physical Characteristics

Housing: ABS + PC

Dimensions: 42 x 80 x 22 mm (1.65 x 3.15 x 0.87 in)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 75°C (-14 to 167°F)

Power Requirements

Source of Input Power: RS-232 port (TxD signal) or power input jack

Input Voltage: 12 to 48 VDC

Power Consumption: 20 mA @ 5 V (with termination disabled)

Regulatory Approvals

CE: Class B

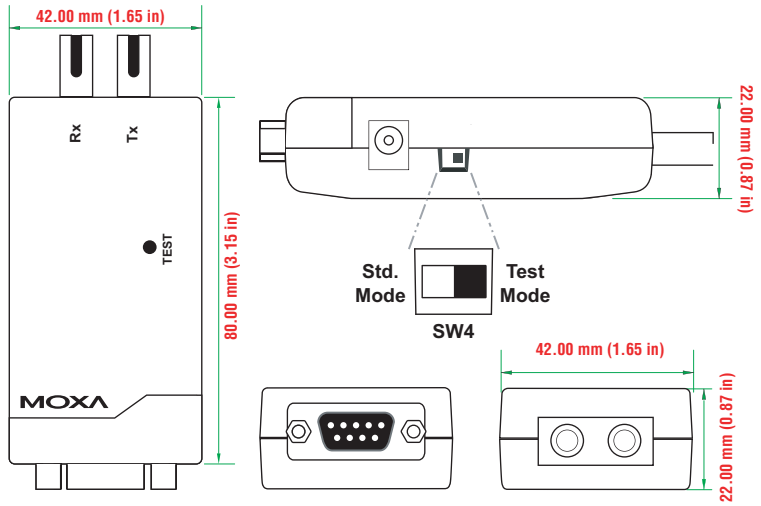
FCC: Class B

Warranty

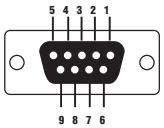
Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



DB9 female connector



PIN	RS-232
1	DCD
2	TxD
3	RxD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS

Ordering Information

Available Models

TCF-90-M: Port-powered RS-232 to multi-mode optical fiber converter with ST connector for 5 km transmission

TCF-90-S: Port-powered RS-232 to single-mode optical fiber converter with ST connector for 40 km transmission

Note: Models with SC/FC connectors or a 60 km range are available by request.

Package Checklist

- TCF-90 media converter
- USB power cord (50 cm)
- Quick Installation Guide
- Warranty Card

Optional Accessories (can be purchased separately)

Power Adaptor: See Appendix A for details

CBL-F9M9-20: DB9 male to DB9 female RS-232 cable (20 cm)

TCC-100/100I Series

Industrial RS-232 to RS-422/485 converters with optional 2 KV isolation

- RS-232 to RS-422 conversion with RTS/CTS support
- RS-232 to 2-wire or 4-wire RS-485 conversion
- 2 KV isolation protection (TCC-100I)
- Wall and DIN-rail mounting
- Plug-in terminal block for easy RS-422/485 wiring
- LED indicators for power, Tx, Rx
- -20 to 60°C operating temperature
- Wide temperature model available (-40 to 85°C)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The TCC-100/100I series RS-232 to RS-422/485 converters increase networking capability by extending the RS-232 transmission distance. Both converters have a superior industrial-grade design that includes DIN-rail mounting, terminal block wiring, external terminal block for power, and optical isolation (TCC-100I and TCC-100I-T only). The TCC-100/100I series converters are ideal solutions for converting RS-232 signals to RS-422/485 in critical industrial environments.

Specifications

RS-232 Side

Connector: DB9 female

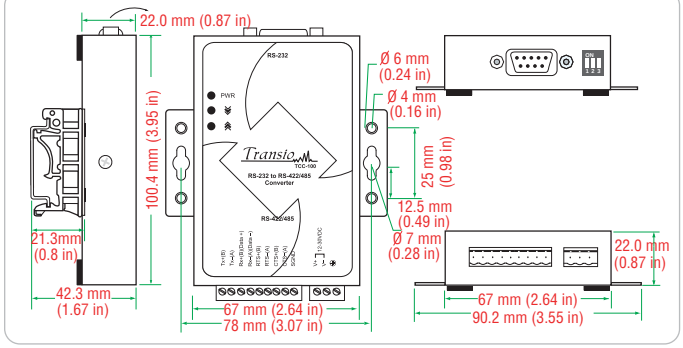
Signals:
RS-232: TxD, RxD, RTS, CTS, GND

RS-422/485 Side

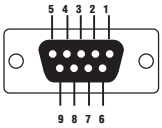
Connector: Terminal Block

Signals:
(interface selected by DIP switch)
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w Signals: Data+, Data-, GND

Dimensions



DB9 female connector



PIN	RS-232
1	---
2	TxD
3	RxD
4	---

PIN	RS-232
5	GND
6	---
7	CTS
8	RTS

Serial Communication

Baudrate: 50 bps to 921.6 Kbps

ESD Protection: 15 KV

Optical Isolation Protection: 2 KV (TCC-100I/100I-T)

Physical Characteristics

Housing: Aluminum

Dimensions: 67 x 100.4 x 22 mm (2.64 x 3.93 x 0.87 in)

Weight: 148 ± 5 g

Environmental Limits

Operating Temperature:
Standard Models: -20 to 60°C (-4 to 140°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-14 to 176°F)

Power Requirements

Source of Input Power: Power input jack

Input Voltage: 12 to 48 VDC

Power Consumption:
TCC-100/100-T: 300 mA @ 12 V
TCC-100I/100I-T: 400 mA @ 12 V

Voltage Reversal Protection: Protects against V+/V- reversal

Over Current Protection: Protects against two signals shorted together

Regulatory Approvals

CE: Class B

FCC: Class B

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Ordering Information

Available Models

TCC-100: RS-232 to RS-422/485 converter, -20 to 60°C operating temperature

TCC-100I: RS-232 to RS-422/485 converter with optical isolation, -20 to 60°C operating temperature

TCC-100-T: RS-232 to RS-422/485 converter, -40 to 85°C operating temperature

TCC-100I-T: RS-232 to RS-422/485 converter with optical isolation, -40 to 85°C operating temperature

Package Checklist

- TCC-100/100I series media converter
- DK-35A: DIN-rail mounting kit
- Power jack to 3-pin terminal block adaptor
- Quick Installation Guide (printed)
- Warranty Card

TCC-80/80I Series

Port-powered RS-232 to RS-422/485 converter with optional 2.5 KV isolation

TCC-80-DB9

TCC-80

TCC-80I-DB9

TCC-80I

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

- External power source supported but not required
- High-speed transmission up to 921.6 Kbps
- Compact size
- Converts RS-422, and both 2-wire and 4-wire RS-485
- RS-485 automatic data direction control
- Automatic baudrate detection
- 15 KV serial ESD protection
- Built-in 120-ohm termination resistors
- 2.5 KV isolation (for TCC-80I only)
- LED port power indicator

Introduction

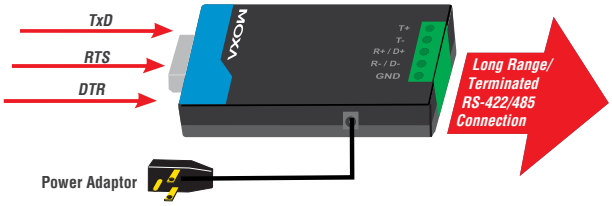
The TCC-80/80I media converters provide complete signal conversion between RS-232 and RS-422/485, without requiring an external power source. The converters support both half duplex 2-wire RS-485 and full duplex 4-wire RS-422/485, either of which can be converted between RS-232's TxD and RxD lines. In addition,the TCC-80/80I's 15 KV ESD protection guards against damage from electrostatic discharge, and the TCC-80I is the world's first high-speed, port-powered converter with 2.5 KV isolation.

Automatic data direction control is provided for RS-485. In this case, the RS-485 driver is enabled automatically when the circuitry senses the TxD output from the RS-232 signal. This means that no programming effort is required to control the transmission direction of the RS-485 signal. Moreover, the TCC-80I's patented LED port power indicator lets you check whether or not the TCC-80I is receiving enough power.

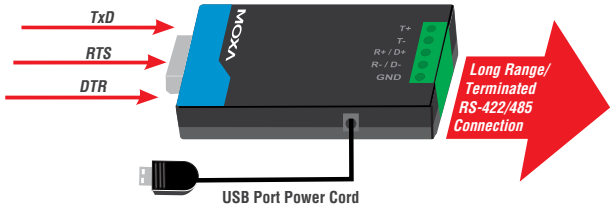
Port Power over RS-232

The RS-232 port of the TCC-80/80I is a DB9 female socket that can connect directly to the host PC, with power drawn from the TxD line. Regardless of whether the signal is high or low, the TCC-80/80I can obtain enough power from the data line. However, external power can be used if the handshake line is not available, if the serial cable is too long, or if the RS-232 device is a low power device. For external power, a 5 to 12 VDC power supply can be connected using an adaptor or a USB power cord.

External Power Adaptor



USB Power

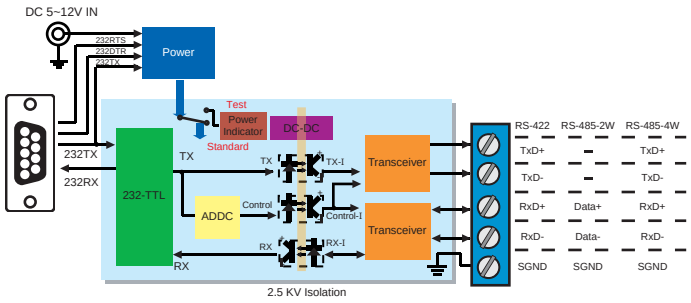


Port Power Dissipation

When installing a TCC-80 or TCC-80I converter, it is important to pay attention to power consumption, RS-232 cable length, and RS-422/485 transmission distance. In general, the TCC-80 and TCC-80I obtain 50 mW of power from the power source. Standard PC COM ports can provide 70 to 90 mW of power if the TxD, RTS, and DTR lines are connected. Moreover, the RS-232 cable should be shorter than 15 m (@ 9600 bps) to ensure that less power is lost from the host/device to the TCC-80. The remainder of the supplied power is used for transmitting the RS-422/485 signal.

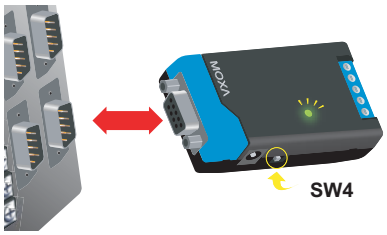
Port Power and Optical Isolation

The RS-232 port of the TCC-80/80I is a DB9 female socket that can connect directly to the host PC, with power drawn from the TxD line. Electrical 2.5 KV isolation for the TCC-80I is achieved with a photo coupler that transforms the electrical signal into light, and then re-transforms the light back into an electrical signal on the other side. In this way, the two electrical circuits are completely isolated from each other. This also protects the devices from ground loop currents, reduces damage caused by data loss, and prevents damage to the communication interfaces.



LED Port Power Indicator

It's easy enough to test the serial device with a multimeter to determine that the serial device will provide enough power to the media converter. However, it's even easier to let the TCC-80/80I test the device for you. Simply connect the TCC-80/80I to the device's RS-232 port and set the SW4 switch to Test mode. If the patented port power LED indicator lights up, the TCC-80/80I is receiving enough power. If the LED does not light up, you will need to attach an external power source to the TCC-80/80I.



Specifications

RS-232 Side

Connector: DB9 female

Signals:
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
(Loop-back wiring: RTS to CTS, DTR to DSR and DCD)

RS-422/485 Side

Connector: Terminal Block or DB9 male

Signals:
(interface selected by DIP switch)
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w Signals: Data+, Data-, GND

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Serial Communication

Baudrate: 50 bps to 921.6 Kbps

Pull High Resistance: 1k ohm

Pull Low Resistance: 150k ohm

ESD Protection: 15 KV

Optical Isolation: 2.5 KV rms for 1 minute (TCC-80I only)

Physical Characteristics

Housing: ABS + PC

Dimensions: 42 x 80 x 22 mm (1.65 x 3.15 x 0.87 in)

Weight: 50 ± 5 g

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 75°C (-14 to 167°F)

Power Requirements

Source of Input Power: RS-232 port (TxD, RTS, DTR) or power input jack

Input Voltage: 5 to 12 VDC

Power Consumption:
TCC-80: 10 mA @ 5 V (with termination disabled)
TCC-80I: 20 mA @ 5 V (with termination disabled)

Regulatory Approvals

CE: Class B

FCC: Class B

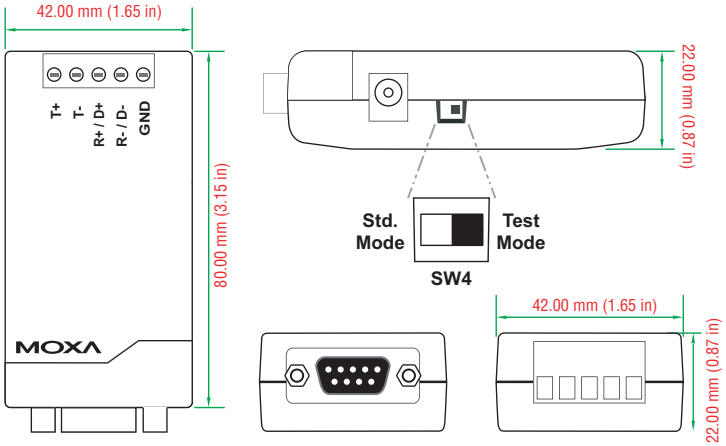
Warranty

Warranty Period: 5 years

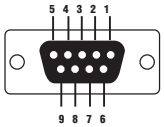
Details: See www.moxa.com/warranty

Dimensions

TCC-80/80I



DB9 female connector

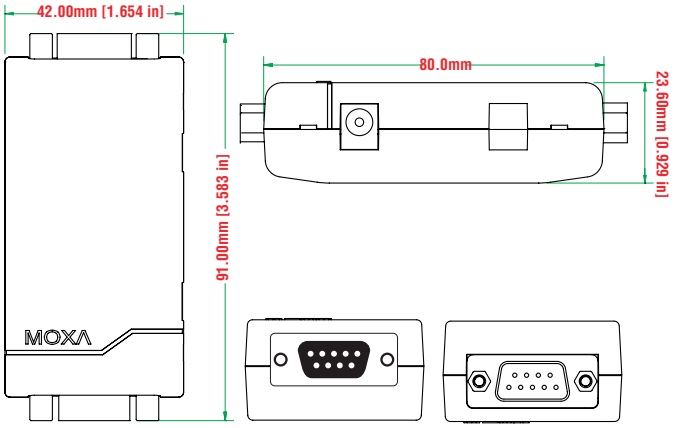


PIN	RS-232
1	DCD
2	TxD
3	RxD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS

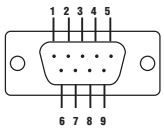
DIP Switch Settings

DIP Switch Settings			
RS-422 with Terminator	SW1	SW2	SW3
	OFF	OFF	ON
RS-422	SW1	SW2	SW3
	OFF	OFF	OFF
4-wire RS-485 with Terminator	SW1	SW2	SW3
	ON	OFF	ON
4-wire RS-485	SW1	SW2	SW3
	ON	OFF	OFF
2-wire RS-485 with Terminator	SW1	SW2	SW3
	ON	ON	ON
2-wire RS-485	SW1	SW2	SW3
	ON	ON	OFF

TCC-80-DB9, TCC-80I-DB9



DB9 male RS-422/485 port



PIN	RS-422/RS-485-4w	RS-485-2w
1	TxD+(B)	---
2	TxD-(A)	---
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(B)
5	GND	GND
6	---	---
7	---	---
8	---	---

Ordering Information

Available Models

TCC-80: Port-powered RS-232 to RS-422/485 converter with 15 KV serial ESD protection and terminal block on the RS-422/485 side

TCC-80-DB9: Port-powered RS-232 to RS-422/485 converter with 15 KV serial ESD protection and DB9 male connector on the RS-422/485 side

TCC-80I: Port-powered RS-232 to RS-422/485 converter with 15 KV serial ESD protection, terminal block on the RS-422/485 side, and 2.5 KV optical isolation

TCC-80I-DB9: Port-powered RS-232 to RS-422/485 converter with 15 KV serial ESD protection, DB9 male connector on the RS-422/485 side, and 2.5 KV optical isolation

Optional Accessories (can be purchased separately)

CBL-F9M9-20: DB9 male to DB9 female RS-232 cable (20 cm)

Package Checklist

- TCC-80 or TCC-80I media converter
- USB power cord (50 cm)
- Quick Installation Guide (printed)
- Warranty Card

TCC-120/120I

Industrial RS-422/485 converter/repeater with optional 2 KV isolation

- Boost serial signal to extend transmission distance
- Wall or DIN-rail mounting
- Terminal block for easy wiring
- Power input from terminal block
- DIP switch setting for built-in terminator (120 ohms)
- Boost RS-422 or RS-485 signal, or convert RS-422 to RS-485
- 2 KV isolation protection (TCC-120I)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The TCC-120 and TCC-120I are RS-422/485 converters/repeaters designed to extend RS-422/485 transmission distance. Both products have a superior industrial-grade design that includes DIN-rail mounting, terminal block wiring, and external terminal block for power. In addition, the TCC-120I supports optical isolation for system protection. The TCC-120 and TCC-120I are ideal RS-422/485 converters/repeaters for critical industrial environments.

Specifications

Serial Communication

Connectors: Terminal Block on both ends

Baudrate: 50 bps to 921.6 Kbps

Signals:
RS-422/485-4w: TxD+, TxD-, RxD+, RxD-
RS-485-2w: Data+, Data-

RS-485 Data Direction Control: ADDC® (automatic data direction control)

ESD Protection: 15 KV for all signals

Optical Isolation: 2 KV for power and signal (TCC-120I only)

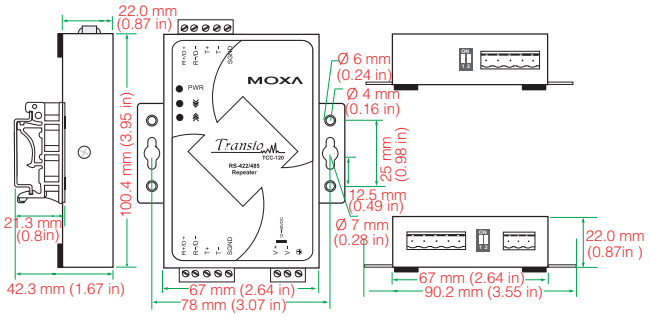
Physical Characteristics

Housing: Aluminum

Dimensions: 67 x 100.4 x 22 mm (2.64 x 3.93 x 0.87 in)

Weight: 148 ± 5 g

Dimensions



Environmental Limits

Operating Temperature: -20 to 60°C (-4 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-14 to 176°F)

Power Requirements

Source of Input Power: RS-232 port (TxD signal) or power input jack

Input Voltage: 12 to 48 VDC

Power Consumption:
TCC-120: 98 mA @ 12 V, 1.18 W
TCC-120I: 234 mA @ 12 V, 2.81 W

Voltage Reversal Protection: Protects against V+/V- reversal

Over Current Protection: Protects against two signals shorted together

Regulatory Approvals

CE: Class B

FCC: Class B

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Ordering Information

Available Models

TCC-120: RS-422/485 converter/repeater

TCC-120I: RS-422/485 converter/repeater with 2 KV optical isolation

Package Checklist

- TCC-120 or TCC-120I media converter
- DK-35A: DIN-rail mounting kit
- Quick Installation Guide (printed)
- Warranty Card

TCC-82

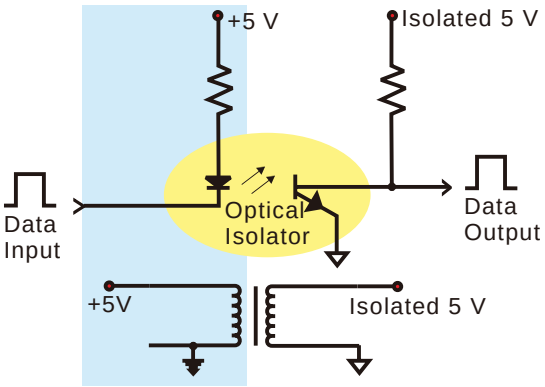
Port-powered RS-232 4-channel isolator

- 4 channels of 4 KV RMS isolation for 1 minute
- External power source supported but not required
- 15 KV serial ESD protection
- Automatic baudrate detection
- Compact size

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

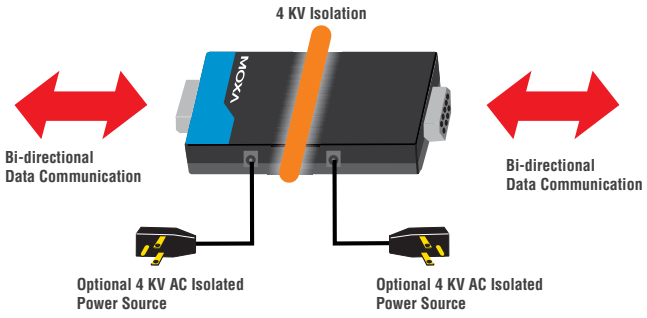
The TCC-82 provides full electrical isolation for bi-directional serial communication between two RS-232 devices in a compact, industrial-grade package. Both sides of an RS-232 connection are isolated optically to provide perfect protection against lightning surges, accidental high voltage shorts, and ground loops. The built-in, wide range isolators are tested to ensure that they can withstand more than 4 KV rms input to output for 1 minute. This means that the TCC-82 not only meets the requirements of general serial data communications, but also the high standards required by industrial automation and medical applications. The TCC-82 protects the TxD and RxD data lines, and also protects the RTS and CTS handshake lines for a total of 4 isolated channels to provide complete protection of your RS-232 applications.



External Power Source Not Required

The TCC-82 supports port-powered operation, which means that it can obtain power directly from the attached serial devices. Power is obtained from the RS-232 TxD, RTS, or DTR lines, regardless of whether the signal is high or low, eliminating the need for an external power supply. However, external power can be used if handshake lines are not available, if the serial cable is too long, or if the serial device is a low powered device. For external power, the TCC-82 can use a 5 to 12 VDC adaptor or a USB power cord. Note that both sides of the connection are powered independently, so if necessary, one side can rely on port power and the other on an external power source.

When installing the TCC-82, we recommend that you connect all output signals. The TCC-82 obtains power from these signals even if they are not used by your system. Care should be taken when choosing the external power supply if your application requires the full 4 KV of isolation. Most commercial power supplies provide only 1500 VAC isolation between the primary and secondary windings. If you are using external power for both sides of the TCC-82, make sure that separate power sources are used, each with sufficient isolation protection.



Specifications

Serial Communication

Connectors: DB9 male and DB9 female

Baudrate: 50 bps to 921.6 Kbps

Signals:
RS-232: TxD, RxD, RTS, CTS
(Loop-back wiring: DTR to DSR and DCD)

ESD Protection: 15 KV for all signals

Optical Isolation: 4 KV for 1 minute

Physical Characteristics

Housing: ABS

Dimensions: 42 x 80 x 23.6 mm (1.65 x 3.15 x 0.93 in)

Weight: 60 ± 5 g

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 75°C (-14 to 167°F)

Power Requirements

Source of Input Power: RS-232 port (TxD signal) or power input jack

Input Voltage: 5 to 12 VDC

Power Consumption: 20 mA @ 5 V

Regulatory Approvals

CE: Class B

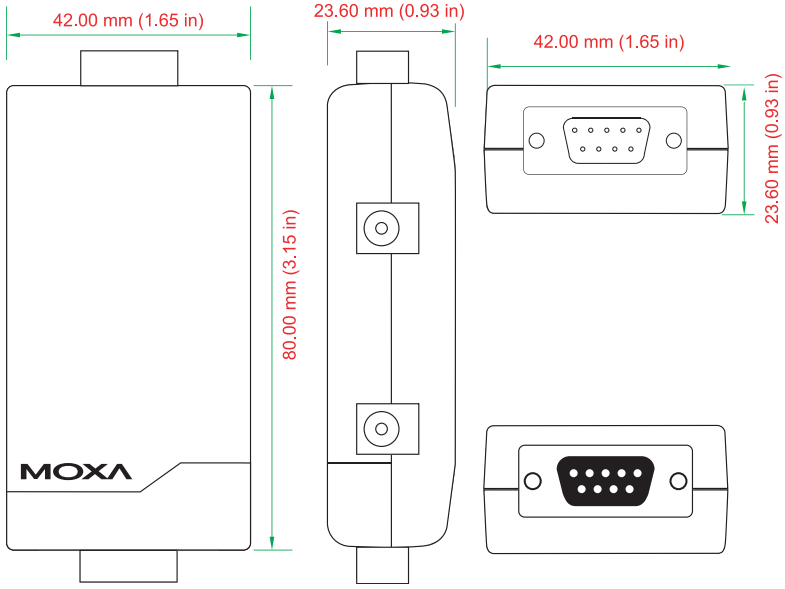
FCC: Class B

Warranty

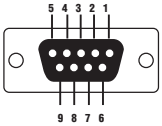
Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions

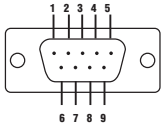


DB9 female connector



PIN	RS-232
1	DCD
2	TxD
3	RxD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS

DB9 male connector



PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

Ordering Information

Available Models

TCC-82: Port-powered RS-232 isolator with 4 KV isolation and 15 KV serial ESD protection

Optional Accessories (can be purchased separately)

Power Adaptor

CBL-F9M9-20: DB9 male to DB9 female RS-232 cable (20 cm)

Package Checklist

- TCC-82 media converter
- USB power cord (50 cm) x 2
- Quick Installation Guide (printed)
- Warranty Card

IMC-101G

Industrial Gigabit Ethernet to fiber media converter

- 10/100/1000BaseT(X) and 1000BaseSX/LX/LHX/ZX supported
- Link Fault Pass-Through (LFP)
- Power failure, port break alarm by relay output
- Redundant power input
- -40 to 75°C operating temperature range (T models)
- Designed for hazardous locations

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The IMC-101G industrial Gigabit media converters are designed to provide reliable and stable 10/100/1000BaseT(X) to 1000BaseSX/LX/LHX/ZX media conversion in harsh industrial environments. The IMC-101G's industrial design is excellent for keeping your industrial automation applications running continuously, and each IMC-101G converter comes with a relay output warning alarm to help prevent damage and loss. All IMC-101G models are subjected to a 100% burn-in test, and are available in models that support a standard operating temperature range of 0 to 60°C, and an extended operating temperature range of -40 to 75°C.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX

Interface

RJ45 ports: 10/100/1000BaseT(X)

Fiber ports: Optional 1000BaseSX/LX/LHX/ZX (LC connector)

LED Indicators: PWR1, PWR2, FAULT, 10/100M (TP port), 1000M (TP and Fiber port)

DIP Switches: Port break alarm mask, Fault Pass-Through, Fiber AN/Force

Alarm Contact: One relay output with current carrying capacity of 1A @ 24 VDC

Optical Fiber

Multi-mode Transmission Distance:
1000BaseSX:
• 0 to 500 m, 850 nm (50/125 µm, 400 MHz*km)
• 0 to 275 m, 850 nm (62.5/125 µm, 200 MHz*km)
1000BaseLX:
• 0 to 1100 m, 1310 nm (50/125 µm, 800 MHz*km)
• 0 to 550 m, 1310 nm (62.5/125 µm, 500 MHz*km)

Single-mode Transmission Distance:
1000BaseLX: 0 to 10 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))
1000BaseLHX: 0 to 40 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))
1000BaseZX: 0 to 80 km, 1550 nm (9/125 µm, 19 PS/(nm*km))

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)

Weight: 630 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant inputs

Input Current: 0.11A (@ 24 V)

Connection: Removable terminal block

Overload Current Protection: 1.1A

Reverse Polarity Protection: Present

Regulatory Approvals

Safety: UL508

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11

Freefall: IEC60068-2-32

Shock: IEC60068-2-27

Vibration: IEC60068-2-6

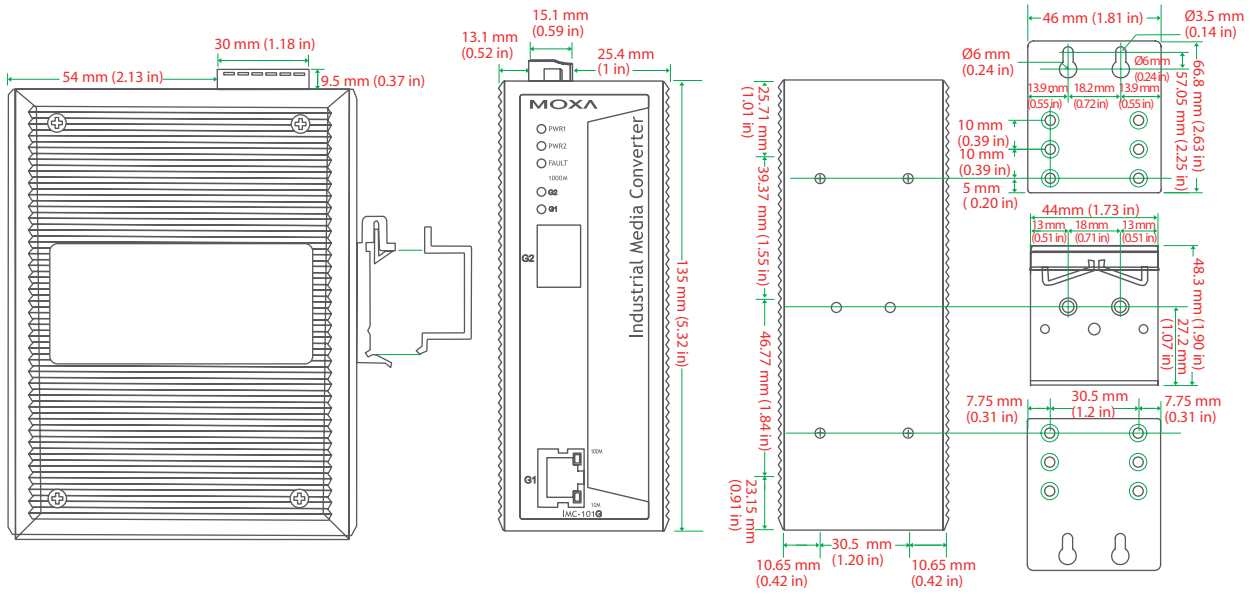
MTBF: 500,000 hrs; Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Side View | Front View | Rear View | Panel Mounting Kit

Ordering Information

Available Models

IMC-101G: Industrial 10/100/1000BaseT(X) to 1000BaseSX/LX/LHX/ZX media converter, 0 to 60°C operating temperature

IMC-101G-T: Industrial 10/100/1000BaseT(X) to 1000BaseSX/LX/LHX/ZX media converter, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DR-4524: 45W/2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input

DR-75-24: 75W/3.2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input

DR-120-24: 120W/5A DIN-Rail 24 VDC power supply, 88 to 132 VAC or 176 to 264 VAC input by switch

WK-46: Wall mounting kit

RK-4U: 4U-high 19” rack mounting kit

IMC-101 Series

Industrial 10/100BaseT(X) to 100BaseFX media converters

- 10/100BaseT(X) auto-negotiation and auto-MDI/MDI-X
- Link Fault Pass-Through (LFP)
- Power failure, port break alarm by relay output
- Redundant power inputs
- -40 to 75°C operating temperature range (T models)
- Designed for hazardous locations (Class 1 Div. 2/Zone 2)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The IMC-101 industrial media converters provide industrial-grade media conversion between 10/100BaseT(X) and 100BaseFX (SC/ST connectors). The IMC-101 converters' reliable industrial design is excellent for keeping your industrial automation applications running continuously, and each IMC-101 converter comes with a relay output warning alarm to help prevent damage and loss. The IMC-101 media converters are designed for harsh industrial environments, such as in hazardous locations (Class 1, Division 2/Zone 2, DNV, and GL Certification), and comply with FCC, TV, UL, and CE standards. The IMC-101 series is available in models that support an operating temperature from 0 to 60°C, and an extended operating temperature from -40 to 75°C. All IMC-101 series converters are subjected to a 100% burn-in test.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX

Interface

RJ45 ports: 10/100BaseT(X)

Fiber ports: 100BaseFX (SC/ST connectors)

LED Indicators: PWR1, PWR2, FAULT, 10/100M (TP port), 100M (Fiber port), FDX/COL (Fiber port)

DIP Switches: 100BaseFX Full/Half duplex selection, port break alarm mask

Alarm Contact: One relay output with current carrying capacity of 1A @ 24 VDC

Optical Fiber

	100BaseFX		
	Multi-mode	Single-mode	Single-mode, 80 km
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-10 dBm	0 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm
Link Budget	12 dB	29 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]	80 km [d]
Saturation	-6 dBm	-3 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm, 3.5 PS/(nm*km) fiber optic cable
d. 9/125 µm, 19 PS/(nm*km) fiber optic cable

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)

Weight: 630 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant inputs

Input Current: 0.16A (@ 24 V)

Connection: Removable terminal block

Overload Current Protection: 1.1A

Reverse Polarity Protection: Present

Regulatory Approvals

Safety: UL508, UL60950-1, CSA C22.2 No. 60950-1, EN60950-1

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11

Hazardous Location:
UL/cUL Class1, Division 2, Groups A, B, C, and D, ATEX Class1, Zone 2, Ex nC IIC (IMC-101-M-ST, IMC-101-S-SC-80 pending)

Freefall: IEC60068-2-32

Shock: IEC60068-2-27

Vibration: IEC60068-2-6

Maritime: DNV, GL

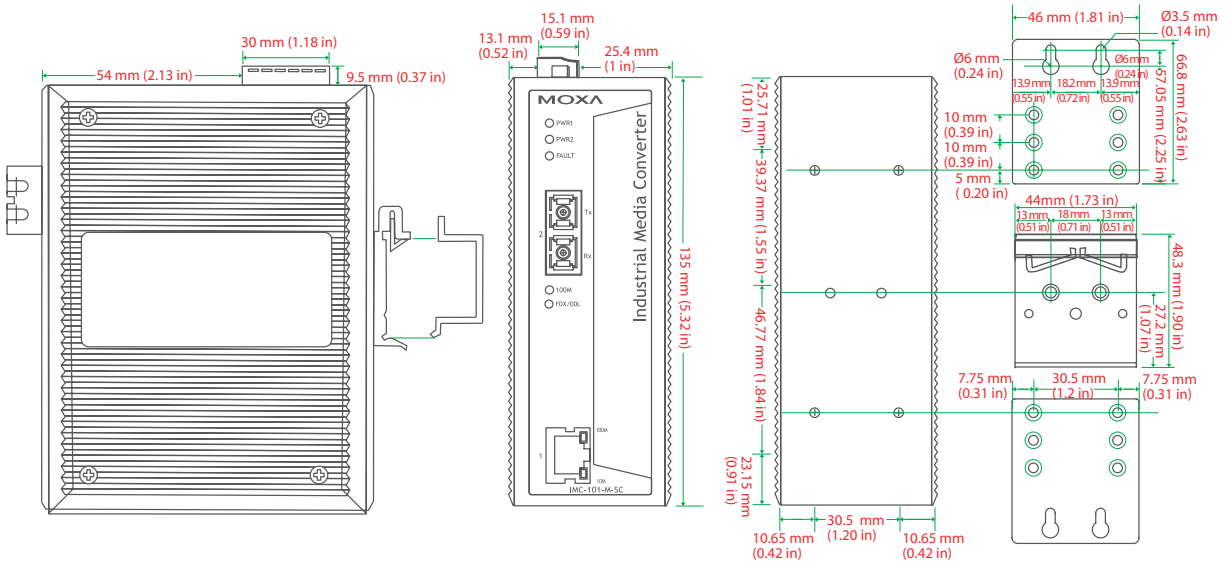
MTBF: 401,000 hrs; Database: MIL-HDBK-217F: GB 25°C

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Side View | Front View | Rear View | Panel Mounting Kit

Ordering Information

Available Models

IMC-101-M-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, SC connector, 0 to 60°C operating temperature
IMC-101-M-ST: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, ST connector, 0 to 60°C operating temperature
IMC-101-S-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, single mode, SC connector, 40 km, 0 to 60°C operating temperature
IMC-101-S-SC-80: Industrial 10/100BaseT(X) to 100BaseFX media converter, single mode, SC connector, 80 km, 0 to 60°C operating temperature
IMC-101-M-SC-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, SC connector, -40 to 75°C operating temperature
IMC-101-M-ST-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, ST connector, -40 to 75°C operating temperature
IMC-101-S-SC-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, single mode, SC connector, 40 km, -40 to 75°C operating temperature
IMC-101-S-SC-80-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, single mode, SC connector, 80 km, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DR-4524: 45W/2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input
DR-75-24: 75W/3.2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input
DR-120-24: 120W/5A DIN-Rail 24 VDC power supply, 88 to 132 VAC/176 to 264 VAC input by switch
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit
SC to ST, SC to SC, ST to ST Connectors: See page A-11 for details

IMC-21 Series

Entry-level industrial 10/100BaseT(X) to 100BaseFX media converters

- Multi-mode or single-mode, with SC or ST fiber connector
- Link Fault Pass-Through (LFP)
- Power inputs: 12 to 45 VDC, 18 to 30 VAC (47-63 Hz)
- -10 to 60°C operating temperature range
- DIP switches to select FDX/HDX/10/100/Auto/Force

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The IMC-21 industrial media converters are entry-level 10/100BaseT(X) to 100BaseFX media converters designed to provide reliable and stable operation in harsh industrial environments. The converters are a cost-effective solution that run on either a 12 to 45 VDC power input or 18 to 30 VAC power input, and can operate reliably in temperatures ranging from -10 to 60°C. The rugged hardware design ensures that your Ethernet equipment can withstand demanding industrial conditions. The IMC-21 converters are easy to mount on a DIN-Rail or in distribution boxes.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control

Interface

RJ45 ports: 10/100BaseT(X)

Fiber ports: 100BaseFX (SC/ST connectors)

LED Indicators: Power, 10/100M (TP port), 100M (fiber port), FDX/COL (fiber port)

DIP Switches: TP port's 10/100M, Half/Full modes, and Force/Auto modes, fiber connection's Full/Half mode, Link Fault Pass-Through (LFP)

Optical Fiber

	100BaseFX	
	Multi-mode	Single-mode
Distance	5 km, 1300 nm	40 km, 1310 nm
Max. TX Output	-14 dBm	0 dBm
Min. TX Output	-20 dBm	-5 dBm
RX Sensitivity	-34 to -30 dBm	-36 to -32 dBm

Physical Characteristics

Housing: Plastic, IP30 protection

Dimensions: 25 x 109 x 97 mm (0.98 x 4.29 x 3.82 in)

Weight: 125 g

Installation: DIN-Rail mounting

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 70°C (-40 to 158°F)

Power Requirements

Input Voltage: 12 to 45 VDC, 18 to 30 VAC (47-63 Hz)

Input Current: 0.15A (@ 24 V)

Connection: Removable 3-contact terminal block

Overload Current Protection: 1.1 A

Reverse Polarity Protection: Present

Regulatory Approvals

Safety: UL508, UL60950-1, CSA C22.2 No. 60950-1, EN60950-1

EMI: FCC Part 15, CISPR (EN55022) class A

EMS:
EN61000-4-2 (ESD)
EN61000-4-3 (RS)
EN61000-4-4 (EFT)
EN61000-4-5 (Surge)
EN61000-4-6 (CS)

Freefall: IEC60068-2-32

Shock: IEC60068-2-27

Vibration: IEC60068-2-6

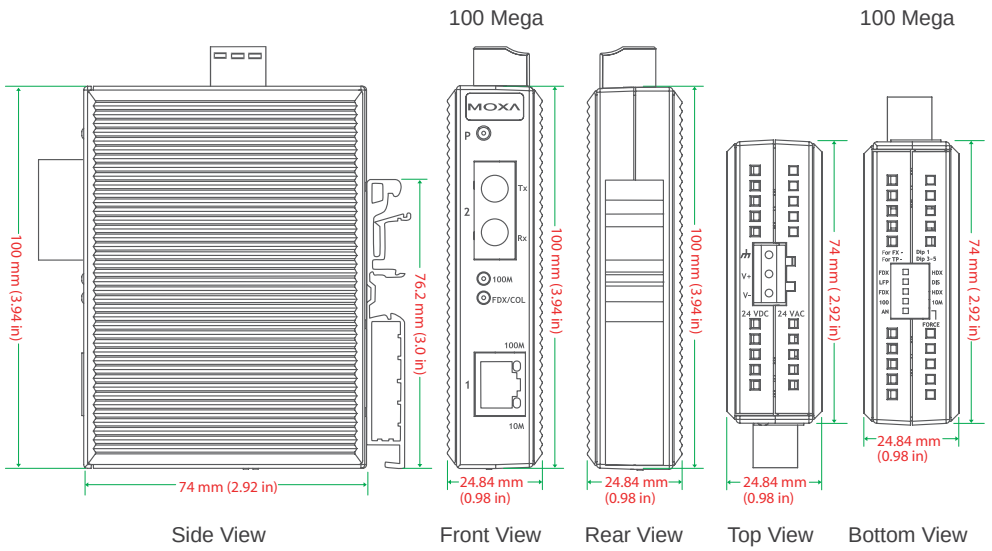
MTBF: 353,000 hrs; Database: MIL-HDBK-217F: GB 25°C

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Available Models

IMC-21-M-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, SC connector

IMC-21-M-ST: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, ST connector

IMC-21-S-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, single mode, SC connector

Optional Accessories (can be purchased separately)

RK-4U: 4U-high 19" rack mounting kit

SC to ST, SC to SC, ST to ST Connectors: See page A-11 for details

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WLAN & Cellular Solutions

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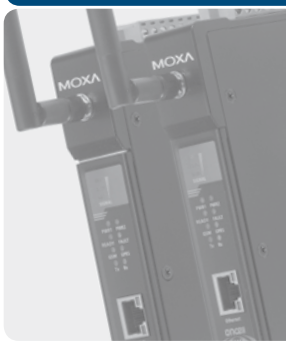
WLAN & Cellular Solutions



Industrial AP/Bridge/Client Solutions

	AWK-4222-T	AWK-4121-T	AWK-3222 AWK-3222-T	AWK-3121 AWK-3121-T
WLAN				
IEEE Standards	IEEE 802.11a/b/g/i, IEEE 802.3a/u, IEEE 802.3af			
Spread Spectrum and Modulation (typical)	• DSSS with DBPSK, DQPSK, CCK • OFDM with BPSK, QPSK, 16QAM, 64QAM 64QAM @ 54Mbps, 16QAM @ 24/36Mbps, QPSK @ 12/18Mbps CCK @ 11/5.5Mbps, DQPSK @ 2Mbps, DBSK@ 1Mbps			
Operating Channels (central frequency)	US: 2.412 to 2.462 GHz (11 channels); 5.18 to 5.24 GHz (4 channels) EU: 2.412 to 2.472 GHz (13 channels); 5.18 to 5.24 GHz (4 channels) JP: 2.412 to 2.472 GHz (13 channels, OFDM); 2.412 to 2.484 GHz (14 channels, DSSS); 5.18 to 5.24 GHz (4 channels for W52)			
Number of RF modules	2	1	2	1
Interfaces				
Number of Antenna Connectors	4	2	4	2
Antenna Connector Type	N-type (female)	N-type (female)	RP-SMA (female)	RP-SMA (female)
10/100BaseT(X) LAN Port	2	1	2	1
RS-232 Console Port	1, waterproof RJ-45	1, waterproof RJ-45	1, RJ-45	1, RJ-45
LED Indicators	PWR, FAULT, STATE, WLAN1, WLAN2, LAN1, LAN2	PWR, FAULT, STATE, WLAN, LAN	PWR1, PWR2, PoE, FAULT, STATE, WLAN1, WLAN2, 10M, 100M	PWR1, PWR2, PoE, FAULT, STATE, signal strength, CLIENT MODE, BRIDGE MODE, WLAN, 10M, 100M
Alarm Contact (Digital Output)	1	1	1	1
Digital Inputs	2	2	2	2
DI/DO Connector Type	8-pin M12 (A-coding)		10-pin terminal block	
Physical Characteristics				
Housing	Metal (IP67)	Metal (IP67)	Metal (IP30)	Metal (IP30)
Weight	1.22 kg	1.2 kg	880 g	850 g
Dimensions	224 x 147.7 x 66.5 mm		62.05 x 135 x 105 mm	53.6 x 135 x 105 mm
Installation	Wall mounting (standard), DIN-Rail mounting (optional), pole mounting (optional)	Wall mounting (standard), DIN-Rail mounting (optional), pole mounting (optional)	DIN-Rail mounting (standard), Wall mounting (optional)	DIN-Rail mounting (standard), Wall mounting (optional)
Environmental Limits				
Operating Temperature	-40 to 75°C	-40 to 75°C	0 to 60°C or -40 to 75°C	0 to 60°C or -40 to 75°C
Operating Humidity	5% to 95%	5% to 95%	5% to 95%	5% to 95%
Storage Temperature	-40 to 85°C	-40 to 85°C	-40 to 85°C	-40 to 85°C
Power Requirements				
Input Voltage	Redundant dual power inputs (12 to 48 VDC)			
Connector	5-pin M12 (A-coding)		10-pin terminal block	
IEEE 802.3af 48 VDC PoE	√	√	√	√
Reverse Polarity Protection	√	√	√	√
Regulatory Approvals				
Radio	EN300 328, EN301 893, ARIB STD-33/T66/T71 (Japan)			
EMC	EN301 489-1/-17, FCC Part 15, EN55022, EN55024	EN301 489-1/-17, FCC Part 15, EN55022, EN55024, IEC61000-6-2/-4	EN301 489-1/-17, FCC Part 15, EN55022, EN55024	EN301 489-1/-17, FCC Part 15, EN55022, EN55024, IEC61000-6-2/-4
Safety	---	EN60950-1, UL60950-1	---	EN60950-1, UL60950-1
Environment/EMC compliance	---	EN50155, EN50121-4	---	EN50155, EN50121-4
Reliability				
Warranty	5 years (see www.moxa.com/warranty)			

Wireless Serial Device Servers

	NPort® W2004	NPort® W2150 Plus NPort® W2150 Plus-T	NPort® 2250 Plus NPort® 2250 Plus-T
WLAN Interface			
IEEE 802.11b/g	√	---	---
IEEE 802.11a/g/b	---	√	√
Radio Frequency Type	DSSS/OFDM	DSSS/OFDM	DSSS/OFDM
WEP	64/128-bit data encryption		
WPA, WPA2, 802.11i	Enterprise mode and Pre-Share Key (PSK) mode		
Encryption	---	128-bit TKIP/AES-CCMP EAP-TLS, PEAP/GTC, PEAP/MD5, PEAP/MSCHAPV2, EAP-TTLS/PAP, EAP-TTLS/CHAP, EAP-TTLS/MSCHAP, EAP-TTLS/MSCHAPV2, EAP-TTLS/EAP-MSCHAPV2, EAP-TTLS/EAP-GTC, EAP-TTLS/EAP-MD5, LEAP	
Max. Transmission Rate	54 Mbps	54 Mbps	54 Mbps
Max. Transmission Distance	300 m	100 m	100 m
LAN Interface			
Ethernet Ports	1 x 10/100 Mbps (RJ45)	1 x 10/100 Mbps (RJ45)	1 x 10/100 Mbps (RJ45)
1.5 KV Magnetic Isolation Protection	√	√	√
Serial Interface			
Number of Ports	4	1	2
Serial Standards	RS-232/422/485	RS-232/422/485	RS-232/422/485
Connector	RJ45	DB9-M	DB9-M
Console Port	√	---	---
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark
Flow Control	RTS/CTS, XON/XOFF, DTR/DSR	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF
Baudrate	50 bps to 460.8 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps
Serial Data Log	64 KB	64 KB	64 KB
Software			
Network Protocols	ICMP, IP, TCP, UDP, DHCP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, SSH, HTTPS		
Configuration Options	Web Console, Serial Console, Telnet Console, Windows Utility		
Management	---	SNMP MIB-II	SNMP MIB-II
Secure Configuration Options	HTTPS, SSH	HTTPS, SSH	HTTPS, SSH
Utilities	NPort® Search Utility and NPort® Windows Driver manager		
Windows Real COM Drivers	Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded		
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i		
Linux Real TTY Drivers	Linux 2.4.x/2.6.x		
Physical Characteristics			
Housing	Metal (IP30)	Aluminum	
Weight	1730 g	780 g	
Dimensions	45.8 x 135 x 105 mm	77 x 111 x 26 mm	
Environmental Limits			
Operating Temperature	0 to 60°C	0 to 55°C or -40 to 75°C	
Operating Humidity	5% to 95%	5% to 95%	
Storage Temperature	-20 to 85°C	-40 to 85°C	
Power Requirements			
Input Voltage	12 to 48 VDC	12 to 48 VDC	
Power Consumption	685 mA @ 12 V, 340 mA @ 24 V, 185 mA @ 48 V	560 mA @ 12 V, 294 mA @ 24 V, 162 mA @ 48 V	
Regulatory Approvals			
Safety	UL (UL60950-1), TÜV (EN60950-1)	UL (UL60950-1), TUV (EN60950-1)	
Radio	CE (ETSI EN 300 328)	CE (ETSI EN 301 893, ETSI EN 300 328), ARIB RCR STD-33, ARIB STD-66	
EMC	CE (EN55022 and EN55024 Class A, ETSI EN 301 489-17, ETSI EN 301 489-1)	CE (EN55022 and EN55024 Class A, ETSI EN 301 489-17, ETSI EN 301 489-1)	
EMI	FCC (Part 15 Subpart B Class A, Subpart C)	FCC Part 15 (Subpart B Class A, Subpart C, Subpart E), VCCI	
Reliability			
MTBF	81,501 hrs	352,547 hrs	352,034 hrs
Warranty	5 years (see www.moxa.com/warranty)		

Cellular Routers and IP Gateways

	OnCell 5004-HSDPA	OnCell 5104-HSDPA	OnCell 5004	OnCell 5104	OnCell G3110-HSDPA	OnCell G3150-HSDPA	OnCell G3110	OnCell G3150
Cellular Interface								
Standards	UMTS/HSDPA		GSM/GPRS		UMTS/HSDPA		GSM/GPRS/EDGE	
Tri-band Options	850/1900/2100 MHz		---	---	850/1900/2100 MHz		---	---
Quad-band Options	850/900/1800/1900 MHz		850/900/1800/1900 Mhz		850/900/1800/1900 MHz			
EDGE Multi-slot	Class 10	Class 10	---	---	Class 10	Class 10	Class 12	Class 12
EDGE Terminal Device	Class B	Class B	---	---	Class B	Class B	Class B	Class B
GPRS Multi-slot	Class 10	Class 10	Class 10	Class 10	Class 10	Class 10	Class 12	Class 12
GPRS Terminal Device	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B
GPRS Coding Schemes	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4
WAN Interface								
Number of Ports	1	1	1	1	---	---	---	---
Ethernet	10/100M (RJ45)	10/100M (RJ45)	10/100M (RJ45)	10/100M (RJ45)	---	---	---	---
Isolation	1.5 KV Magnetic Isolation Protection				---	---	---	---
LAN Interface								
Number of Ports	4	4	4	4	1	1	1	1
Ethernet	10/100M (RJ45)	10/100M (RJ45)	10/100M (RJ45)	10/100M (RJ45)	10/100M (RJ45)	10/100M (RJ45)	10/100M (RJ45)	10/100M (RJ45)
Isolation	1.5 KV Magnetic Isolation Protection							
SIM Interface								
Number of SIMs	2	2	2	2	1	1	1	1
SIM Control	3 V	3 V	3 V	3 V	3 V	3 V	3 V	3 V
Serial Interface								
Number of Ports	---	---	---	---	1	1	1	1
Serial Standards	---	---	---	---	RS-232	RS-232/422/485	RS-232	RS-232/422/485
Connector	---	---	---	---	DB9-M	DB9-M and TB	DB9-M	DB9-M and TB
15 KV ESD Protection	---	---	---	---	√	√	√	√
2 KV Power EFT/Surge	---	---	---	---	√	√	√	√
Serial Parameters	---	---	---	---	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark			
Flow Control	---	---	---	---	RTS/CTS, XON/XOFF			
Baudrate	---	---	---	---	50 bps to 921.6 Kbps			
I/O Interface								
Alarm Contacts	---	1	---	1	1	1	1	1
Digital Inputs	---	2	---	2	2	2	2	2
Software								
Network Protocols	UDP/TCP, SNTP, ICMP, DDNS, DHCP/BOOTP, PPPoE, PPP, DNS Relay, HTTPS, Telnet				ICMP, TCP/IP, UDP, DHCP, Telnet, DNS, SNMP, HTTP, SMTP, HTTPS, SNTP, ARP, SSL			
Router/Firewall	NAT, port forwarding, routing				NAT, port forwarding			
Authentication	Local user-name and password				Local user-name and password			
Security	IP filtering				Accessible IP list			
Operation Modes	---	---	---	---	Real COM, Secure Real COM, TCP Server, Secure TCP Server, TCP Client, Secure TCP Client, UDP, RFC2217, Ethernet Modem, Virtual Modem, SMS Tunnel			
Configuration and Management Options	---	---	---	---	SNMP MIB-II, SNMP Private MIB, SNMPv1/v2c/v3, DDNS, IP Report, Web/Telnet/Serial-Console/SSH			
Utilities	---	---	---	---	Provided for Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server-2008, Windows XP/2003/Vista/Server-2008 x64 Edition			
Windows Real COM Drivers	---	---	---	---	Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server 2008, Windows XP/2003/Vista/Server 2008 x64 Edition			
Fixed TTY Drivers	---	---	---	---	SCO Unix, SCO OpenServer 5, SCO OpenServer 6, UnixWare 7, SVR4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD 5, FreeBSD 6			
Linux Real TTY Drivers	---	---	---	---	Linux kernels 2.2.x, 2.4.x, 2.6.x			
OnCell Central	---	---	---	---	Centralized management solution for accessing private IPs from the Internet			
Physical Characteristics								
Housing	Aluminum (IP30)	Aluminum (IP30)	Aluminum (IP30)	Aluminum (IP30)	Aluminum (IP30)			
Weight	505±5 g	645±5 g	505±5 g	645±5 g	440±5 g			
Dimensions (mm)	158 x 103 x 34	160 x 103 x 50	158 x 103 x 34	160 x 103 x 50	28 x 126 x 93			
Environmental Limits								
Operating Temperature	-30 to 55°C	-30 to 55°C	-30 to 55°C	-30 to 55°C	-30 to 55°C	-30 to 55°C	-30 to 55°C	-30 to 55°C
Operating Humidity	5% to 95%	5% to 95%	5% to 95%	5% to 95%	5% to 95%	5% to 95%	5% to 95%	5% to 95%
Storage Temperature	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C
Power Requirements								
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Connector	1 TB, 1 power jack	2 TBs	1 TB, 1 power jack	2 TBs	2 TBs	2 TBs	2 TBs	2 TBs
Regulatory Approvals								
Safety	UL (UL60950-1)							
RF	FCC part22H, FCC PART24F, EN301 489-1, EN301 489-7, EN301 511							
PTCRB	---	---	---	---	---	V	---	V
EMC	CE: EN55022 Class A / EN55024. FCC: FCC part 15 subpart B. Class A, EN61000-4-2 (ESD) Level 4, EN61000-4-3 (RS) Level 3, EN61000-4-4 (EFT) Level 4, EN61000-4-5 (Surge) Level 3, EN61000-4-8 Level 3, EN61000-4-12 Level 3							
Reliability								
Warranty	5 years (see www.moxa.com/warranty)							

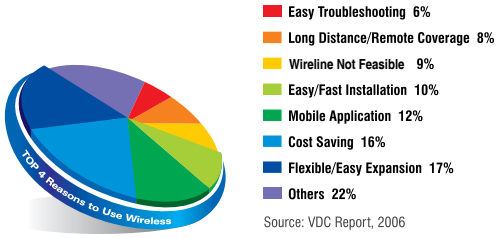
Cellular IP and GSM/GPRS Modems

	OnCell G3111	OnCell 3151	OnCell 3211	OnCell 3251	OnCell G2100 OnCell G2100-T	OnCell G2150I
Cellular Interface						
Standards	GSM/GPRS	GSM/GPRS	GSM/GPRS	GSM/GPRS	GSM/GPRS	GSM/GPRS
Quad-band Options	850/900/1800/1900 MHz					
GPRS Multi-slot Class	Class 10	Class 10	Class 10	Class 10	Class 10	Class 10
GPRS Terminal Device Class	Class B	Class B	Class B	Class B	Class B	Class B
GPRS Coding Schemes	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4
LAN Interface						
Number of Ports	1	1	1	1	---	---
Ethernet	10/100 Mbps (RJ45)	10/100 Mbps (RJ45)	10/100 Mbps (RJ45)	10/100 Mbps (RJ45)	---	---
1.5 KV Magnetic Isolation Protection	√	√	√	√	---	---
SIM Interface						
Number of SIMs	1	1	1	1	1	1
SIM Control	3 V	3 V	3 V	3 V	3 V	3 V
Serial Interface						
Number of Ports	1	1	2	2	1	1
Serial Standards	RS-232	RS-232/422/485	RS-232	RS-232/422/485	RS-232	RS-232/422/485
Connector	DB9-M	DB9-M	DB9-M	DB9-M	DB9-F	DB9-F and 5-pin TB
15 KV ESD Protection	√	√	√	√	√	√
2.5 KV Optical Isolation	---	---	---	---	---	√
2 KV Power EFT/Surge	√	√	√	√	---	---
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark				Data Bits: 7, 8; Stop Bits: 1, 2; Parity: None, Even, Odd, Space, Mark	
Flow Control	RTS/CTS, XON/XOFF				RTS/CTS	
Baudrate	50 bps to 921.6 Kbps				300 bps to 115.2 Kbps	
Software						
Network Protocols	ICMP, TCP/IP, UDP, DHCP, Telnet, DNS, SNMP, HTTP, HTTPS, SMTP, SNTP, ARP				---	---
Authentication	Local user-name and password				---	---
Security	Accessible IP list				---	---
Operation Modes	Real COM, TCP Server, TCP Client, UDP, SMS Tunnel, Reverse Real COM				---	---
Configuration and Management Options	SNMP MIB-II, v3, DDNS, IP Report, Web/Telnet/Serial Console, Serial Logging				---	---
Utilities	Provided for Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server-2008, Windows XP/2003/Vista/Server-2008 x64				---	---
Windows Real COM Drivers	Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server-2008, Windows XP/2003/Vista/Server-2008 x64				---	---
Management Software						
OnCell Central	Centralized management solution for accessing private IPs from the Internet				---	---
Physical Characteristics						
Housing	Aluminum (IP30)				ABS + PC (IP30)	
Weight	165±5 g		185±5 g		150 ± 5 g	
Dimensions	111 x 77 x 26 mm				27 x 123 x 79 mm	
Environmental Limits						
Operating Temperature	-30 to 55°C	-30 to 55°C	-30 to 55°C	-30 to 55°C	0 to 55°C or -30 to 75°C	0 to 55°C
Operating Humidity	5% to 95%	5% to 95%	5% to 95%	5% to 95%	5% to 95%	5% to 95%
Storage Temperature	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C
Power Requirements						
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Connector	1 power jack	1 power jack	1 power jack	1 power jack	1 power jack	1 power jack
Regulatory Approvals						
Safety	UL (UL60950-1)					
RF	FCC part22H, FCC PART24F, EN301 489-1, EN301 489-7, EN301 511					
EMC	CE: EN55022 Class A / EN55024 FCC: FCC part 15 subpart B, Class A EN61000-4-2 (ESD) EN61000-4-3 (RS) EN61000-4-4 (EFT) EN61000-4-5 (Surge) EN61000-4-8 EN61000-4-12				CE (EN55022 Class A, EN55024) FCC part 15 subpart B Class A	
Reliability						
Warranty	5 years (see www.moxa.com/warranty)					

Introduction to Industrial Wireless

Why Go Wireless?

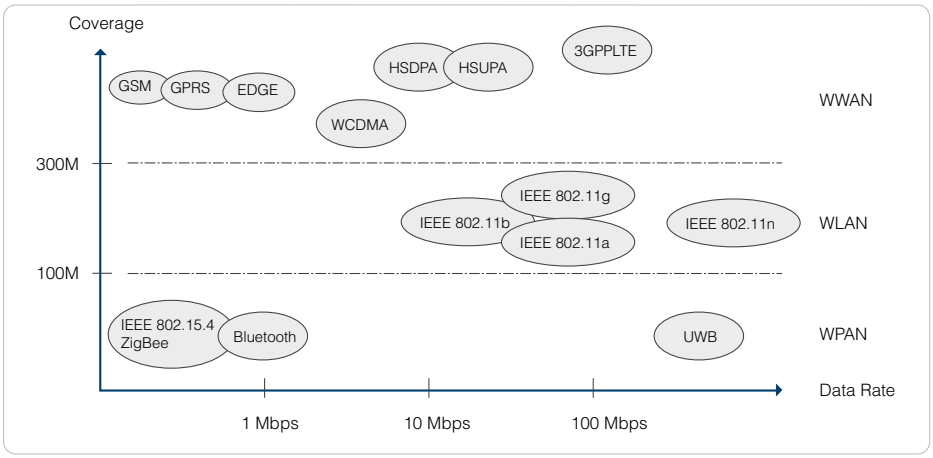
Industry has already accepted wireless networking as a mainstream solution for a number of different applications. The main consideration is the convenience of being able to connect devices without needing to rely solely on wired networks. Wireless communication provides an easier method for connecting devices, particularly those in remote or hard to wire locations. More importantly, wireless technology offers a number of key benefits, including flexible deployment, cost-effectiveness, greater versatility for expansion or migration, and wider network coverage.



Source: VDC Report, 2006

Wireless Technologies

These technologies can be broadly organized into three major categories:



WWAN

Wireless Wide Area Networks (WWANs) are digital cellular networks used for mobile phone and data service. They are operated by carriers such as Cingular Wireless, Vodafone, and Verizon Wireless, and provide connectivity over a wide geographical area. Two WWAN technologies—Global System for Mobile Communications (GSM) and Code Division Multiple Access (CDMA)—dominate WWAN deployments worldwide.

WLAN

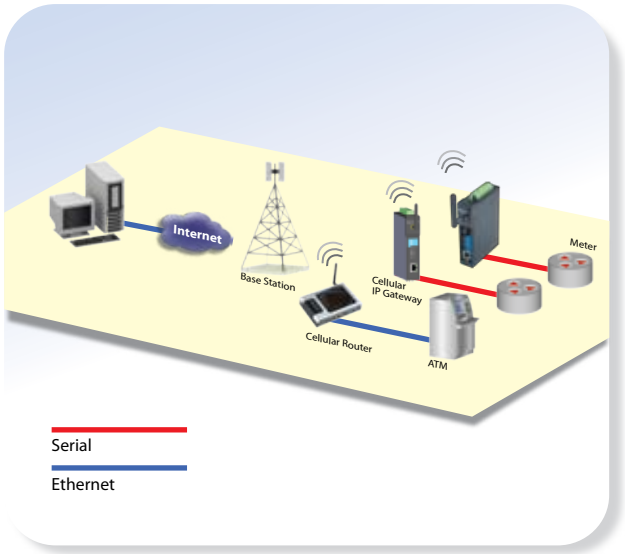
A wireless local area network (WLAN) is a LAN without cables. In contrast to WPANs, WLANs provide robust wireless network connectivity for associated clients up to 100 meters away from the access point. Today's WLANs are based on IEEE 802.11 standards and are referred to as Wi-Fi networks. The 802.11b standard, which operates in the 2.4 GHz frequency band at 11 Mbps, was the first commercially successful WLAN technology. As wireless technology matured, a higher transmission rate of 54 Mbps was achieved with 802.11g, which operates in the 2.4 Ghz band, and 802.11a, which operates in the 5 Ghz frequency band. Today, it is common for dual-band Wi-Fi access points and client network adapters to support various combinations of 802.11a, 802.11b, and 802.11g.

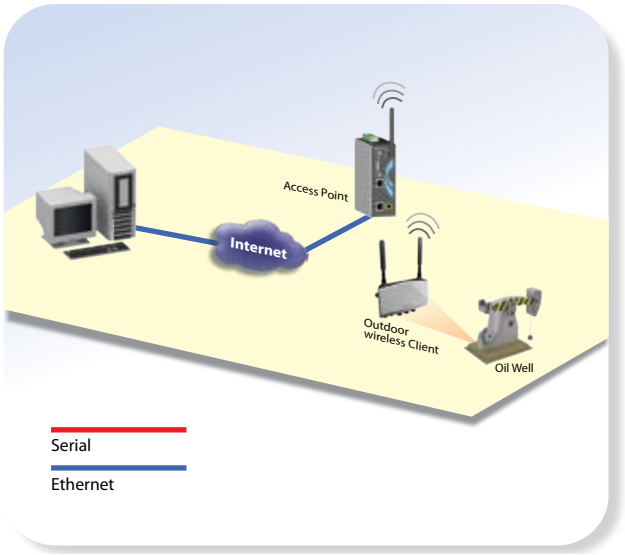
WPAN

Wireless Personal Area Networks (WPANs) are very small, short-range peer-to-peer or ad hoc networks that typically extend to a maximum of 10 meters. Because of their limited range, WPANs are used mainly as cable replacement solutions for data synchronization and connectivity between devices that are close to each other. In other words, WPANs are primarily used to eliminate cables that connect devices to peripherals. Bluetooth, the prevalent WPAN technology in use today, allows devices such as phones, mice, headsets, and other peripheral devices to connect wirelessly over a range of 10 meters. Cordless mice and keyboards are typical WPAN applications.

Moxa Makes Wireless Robust, Secure, and Reliable

Moxa provides a wide selection of industrial wireless solutions that support wireless technologies including WLAN (IEEE 802.11) and GSM/GPRS/WCDMA, and serve a broad spectrum of industries around the world. Wireless network transmissions have unique security concerns, and when used in harsh industrial environments, users must also be aware of the risks posed by extreme temperatures and humidity, excessive shock and vibration, and other environmental factors. Moxa's products support a high level of security, RF redundancy, roaming, and a rugged design for both indoor and outdoor environments, and are suitable for use with a number of industrial applications, such as oil and gas, marine, and many more.





WWAN (Wireless Wide Area Network)

Benefits:

- Quad-band GSM/GPRS/EDGE cellular IP modem
- High speed HSDPA/UMTS IP modem
- AT command
- SMS tunnel
- Link PC/PLC or serial device connection, LAN and Ethernet devices to cellular networks
- Remote configuration
- TCP/IP architecture

WLAN (Wireless Local Area Network)

Benefits:

- IEEE802.11a/b/g standard
- Replaces cables
- Security
- Reliability for harsh environment
- RF and power redundancy for better performance

Core Competencies of Moxa's Industrial Wireless Products

- Wide IEEE802.11a/b/g solution with complete WEP/WPA/WPA2/IEEE802.1X security
- WLAN Turbo Roaming™ for mobile applications
- Versatile TCP/IP operating modes for use with cellular applications
- Extended temperature models available for -40 to 75°C
- IP30/IP67-rated, DIN-rail mountable, and hazardous location certifications

CASE STUDY

Communication-based Train Control System

Communication-based Train Control (CBTC) is an automated railway signaling system deployed in modern metro systems around the world. CBTC is designed to provide immediate status updates and control to avoid accidents due to exceptional conditions, such as sudden breakdowns and power losses. Due to its mobile nature, CBTC uses WLANs so that trains can update their status to the control center and receive commands from the control center in real time.

CBTC systems use access points (AP) placed about 200 meters apart along the railway. For network redundancy, APs should be installed in pairs, with all APs connected to the control center via fiber cabling. Two APs are also installed onboard each, with one in the first car and one in the last car. To ensure proper communication, the APs need to work properly at speeds as high as 80 to 100 kph. While the train is in motion, it must take less than 500 ms to transfer connection from one AP to another, and the total delay from the train to the control center must be under 2 seconds. In addition, the APs must be able to withstand excessive vibration, and EN50155 certification is a must.

Application Requirements

- Wireless communication capability at speeds up to 100 kph Low system recovery time for seamless wireless connectivity
- STP/RSTP support for resuming communication when a wired or wireless link fails
- EN50155 compliant for electronic equipment used on rolling stock

Why Moxa?

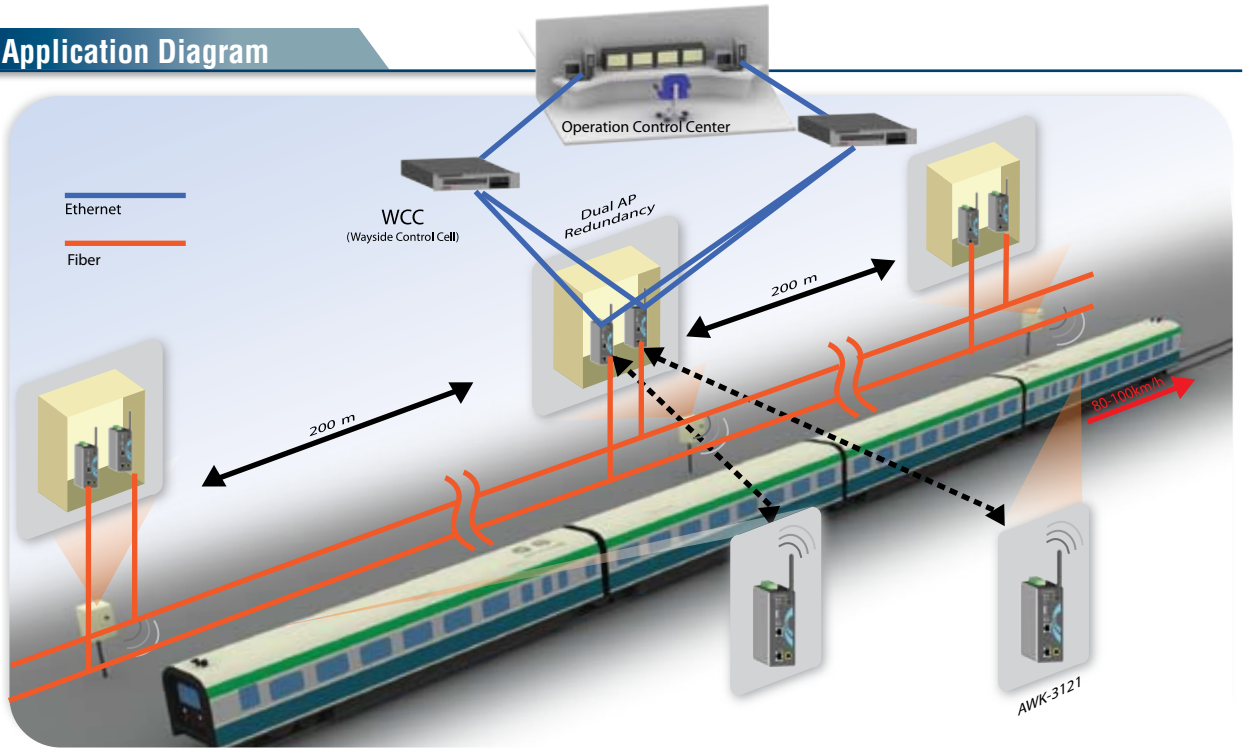
- Turbo™ roaming under 500 ms
- 100 km/h operating speed
- RSTP support

Key Products

AWK-3121 Series Industrial-strength IEEE 802.11a/b/g wireless AP/bridge/client

AWK-4121 Series IP67-rated, IEEE 802.11a/b/g outdoor wireless AP/bridge/client ,-40 to 75°C operating temperature

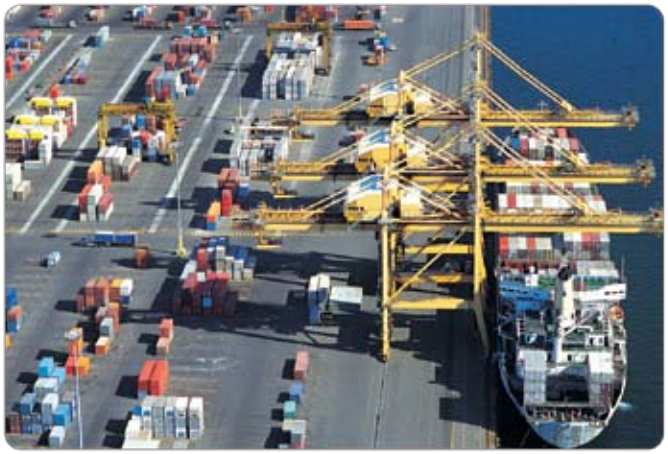
Application Diagram



CASE STUDY

Automated Heavy-duty Harbor Cranes

In port areas, containers are moved by cranes that were traditionally controlled by cables. Nowadays, these cranes are fully automated and handle bigger loads and a larger volume than before. Since transporting containers in a port is a mobile application, maintenance problems can easily arise. For this reason, wireless technology is becoming more and more popular for this kind of application. Using wireless solutions can save the cost of wiring, reduce the possibility of cable damage, and allow the implementation of remote and centralized management.



Moxa's industrial-grade AWK-3121-T and AWK-4121-T wireless access points (APs) are ideal for this type of application. An AP configured for client mode is installed on the moving arm of the crane and another AP configured for AP mode is installed on the ground, allowing the crane's PLC to control the moving arm of the crane. Both APs have a latency period under 50 ms and support a wide operating temperature range from -40 to 75°C. To increase the reliability of the wireless network, the AWK-3121-T and AWK-4121-T also support PoE (power over Ethernet) and two redundant power inputs.

Application Requirements

- Wide operating temperature
- Industrial-grade reliability and network redundancy

Why Moxa?

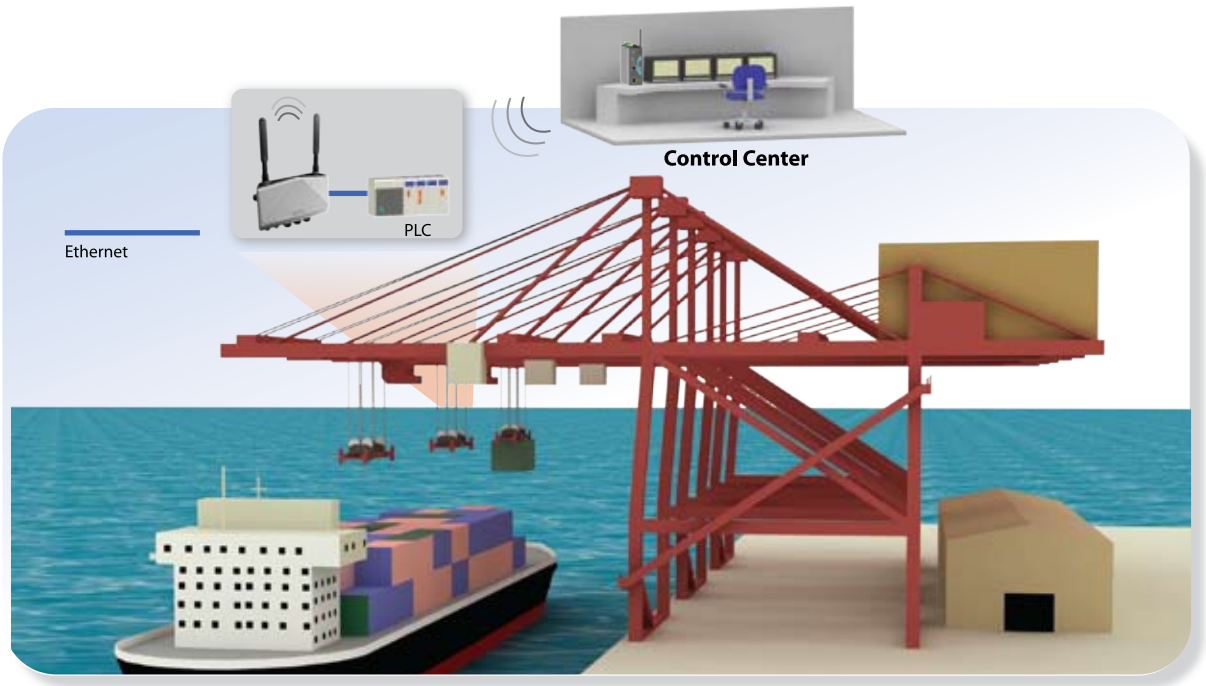
- Interference avoidance
- Latency less than 50 ms
- Wide operating temperature

Key Products

AWK-3121-T Industrial-strength IEEE 802.11a/b/g wireless AP/Bridge/Client, -40 to 75°C operating temperature

AWK-4121-T IP67-rated, IEEE 802.11a/b/g outdoor wireless AP/bridge/client, -40 to 75°C operating temperature

Application Diagram



CASE STUDY

Real-time Status Updates for MRTs

Security is extremely important for mass rapid transit systems due to the high volume of passenger traffic that is handled. In the past, the status of trains, platform gates, various alarm systems, and environmental controls were recorded manually at the stations. However, since train operators and security personnel need real-time information to handle emergency situations, wireless technology is now used to transmit information from a train to the control center while the train is approaching a station. In addition, station operators can transfer information such as the status of other trains and track conditions to arriving and departing trains.

An access point (AP) configured for Client Mode is installed in the first and last coach of each train, and another AP is installed in each station. When a train approaches a station, the AP in the first coach establishes a connection with the station and starts sending information. The length of the platform is about 100 meters, so if the AP in the first coach cannot establish a good connection, the AP in the last coach will take over. Establishing a connection as quickly as possible is important, since the train is only at the station for about 2 to 3 seconds. This means that fast roaming under 1 second is a must.

Application Requirements

- Real-time information updates and transmission between trains and stations
- Reliability and redundancy to ensure seamless network connectivity

Why Moxa?

- Seamless wireless connectivity with Turbo Roaming™ under 500 ms
- EN50155 for railway applications
- RSTP to prevent looping and guarantee high reliability

Key Products

AWK-3121 Series Industrial-strength IEEE 802.11a/b/g wireless AP/bridge/client

Application Diagram

CASE STUDY

Oil Well and Driller Management

Even though oil drilling is an old art, modern real-time networking technology is being used to make the process more energy efficient. For onshore drilling, oil wells are often spread out over a long distance, and consequently it is more efficient to use a “transmission vehicle” that transmits wireless signals. The vehicle drives from well to well to transmit data from a particular well to a central but remote control center. Using such a vehicle is much more efficient, saves on manpower costs, and helps avoid operating errors.

One AP is installed on the oil well to connect to a PLC that monitors the temperature, oil pressure, and other readings. Another AP on the transmission vehicle is set up for client mode. When the transmission vehicle approaches the oil well, the controller on the detecting car establishes a connection with the PLC and downloads the data. To make sure the transmission vehicle can receive data while approaching the oil well, a roaming function is required. Even though the AP is not placed directly in a highly hazardous area, UL Class 1 Division 2 or ATEX Class I Zone II certifications are needed to ensure a basic level of safety. The ability to be able to withstand wide temperatures, especially high temperatures, is also important for this kind of application.

Application Requirements

- UL Class 1 Division 2 and ATEX Class I Zone II certifications
- Fast roaming for transmission vehicles travelling between oil wells

Why Moxa?

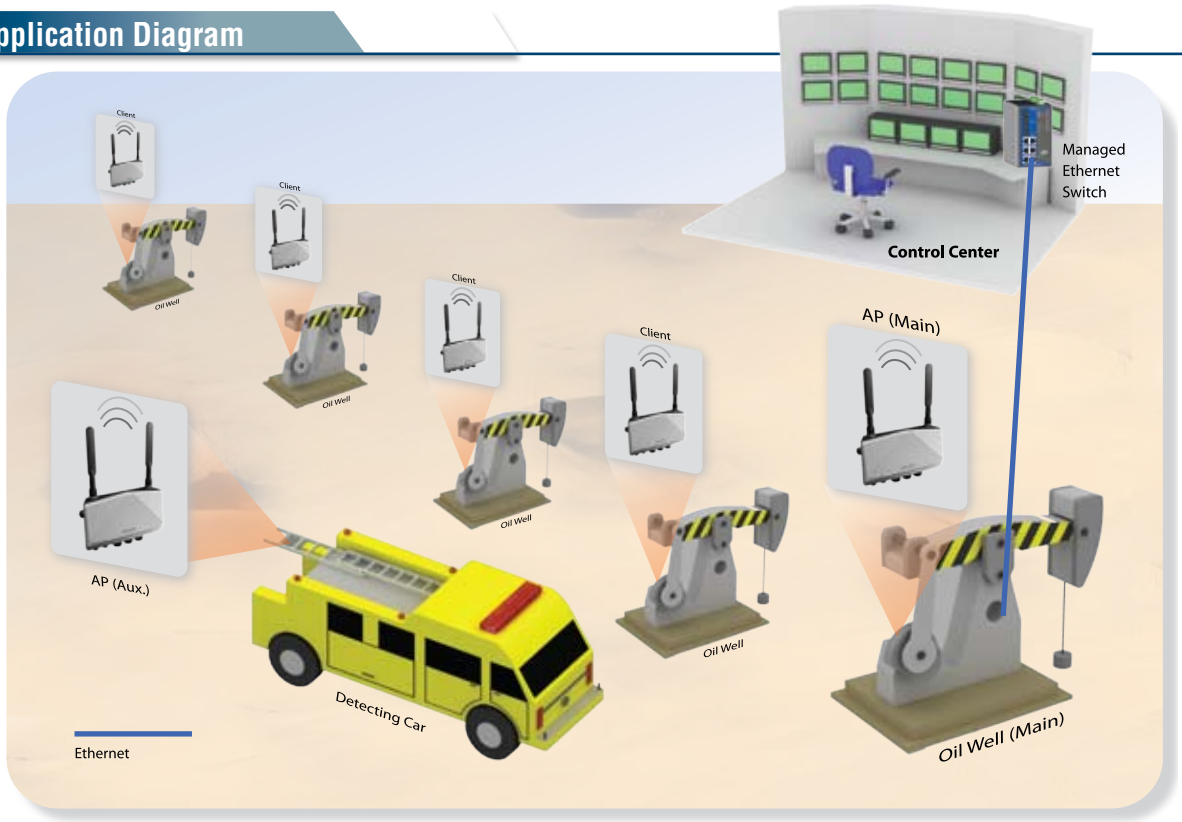
- Standardwireless solutions are more cost-effective than proprietary wireless solutions
- Turbo Roaming™ between oil wells is under 1 second
- Rugged, outdoor design for critical environments
- UL Class 1 Division 2 and ATEX Class I Zone II certifications
- Wide operating temperature range of -40 to 75°C

Key Products

AWK-4121-T IP67-rated, IEEE 802.11a/b/g outdoor wireless AP/bridge/client, -40 to 75°C

AWK-3121-T Industrial-strength IEEE 802.11a/b/g wireless AP/bridge/client, -40 to 75°C

Application Diagram



CASE STUDY

Feeder Terminal Units for Power Distribution

Feeder terminal units (FTUs) play a crucial role in delivering electricity to consumers, and since power plants are often located far from the population centers they serve, electricity must be transmitted across long distances at a high voltage. Power lines deliver electricity from the plant to power substations where it is converted to a lower voltage before it is distributed to the local community by FTUs. Due to safety concerns, FTUs are usually connected in a ring topology within the communities they serve. This design prevents the entire power grid from going down if one of the FTUs fails. Industrial wireless solutions are well suited for FTU applications given their distributed placement and the difficulties associated with building and maintaining a wired infrastructure.

By connecting each FTU to a cellular IP modem such as the OnCell 3000 series, system administrators can receive notifications from the FTUs whenever one of the FTUs goes down. When this happens, the neighboring FTUs will shut off that segment of the ring to prevent the entire power grid from crashing. However, since electricity may be cut off to the rest of the ring, the cellular modem for the downed FTU will notify the RFTU (remote feeder terminal unit) via the control room. The control room then sends a command over the cellular network to switch on the adjacent FTUs to resume power flow in the ring. This design shortens power grid recovery time and simultaneously handles centralized data monitoring. In addition, since the OnCell 3100 series supports Real COM mode, the RFTU does not need to implement special software or use AT commands to implement a TCP/IP connection, saving R&D and maintenance effort.

Application Requirements

- Shortened power grid recovery time
- Wireless connectivity for legacy FTUs
- Simple system structure and easy maintenance

Why Moxa?

- No need to implement TCP/IP protocols and programs on the FTU
- TCP server/client modes
- Two destination IPs
- "Heartbeat" feature indicates when the modem is on
- 2 KV surge protection

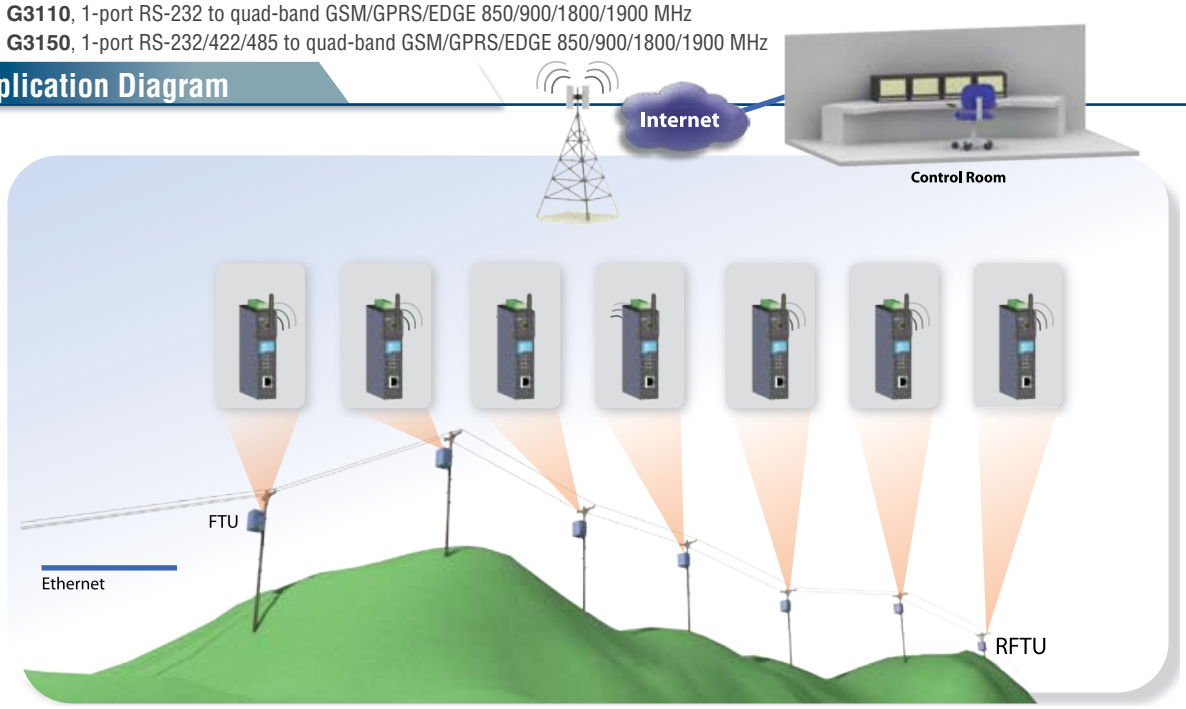
Key Products

OnCell G3100 series of industrial cellular IP gateways

OnCell G3110, 1-port RS-232 to quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz

OnCell G3150, 1-port RS-232/422/485 to quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz

Application Diagram



Getting un-Wired with IEEE 802.11

Introduction

Are you ready for the convenience that comes from sending your Ethernet packets over the air instead of through a wire? Wireless is not for everyone, but if your application uses mobile equipment that is controlled over a TCP/IP network, or the cost of installing wire conduits at your work site is prohibitive, then consider setting up a wireless local area network (WLAN). The IEEE 802.11 standard specifies a way to use radio frequency (RF) technology to send Ethernet packets over the air. Applications that include TCP/IP will run on 802.11-compliant WLANs the same as they do over Ethernet. By common agreement between regulatory agencies around the world (FCC, ETSI, etc.), a WLAN transmits over unlicensed spectrums, with only minor variations from country to country.

802.11 Specifications

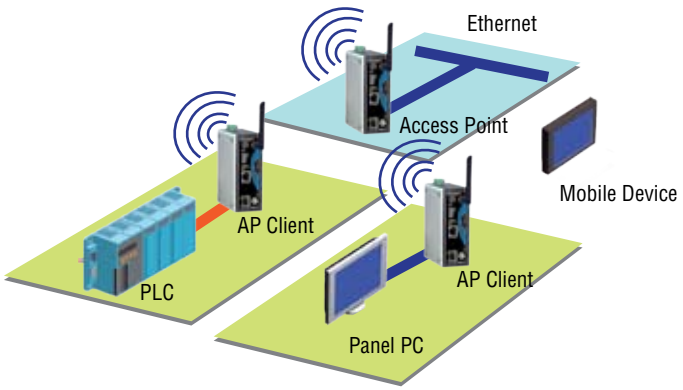
IEEE 802.11, commonly referred to as Wi-Fi, is widely used for wireless communications. Wireless connectivity eliminates the need to install either fiber or Ethernet cable in hard-to-wire locations. IEEE 802.11 is not an alternative to broadband, but it is a fast and efficient way to distribute broadband transmissions, even in critical environments. Choosing the right WLAN technology is an important factor in determining the performance of your wireless network and overall return on investment.

Standard	IEEE 802.11b	IEEE 802.11a	IEEE 802.11g	IEEE 802.11n
Year Approved	1999	1999	2003	Est. 2009[a]
Compatibility	IEEE 802.11b compliant	IEEE 802.11a compliant	IEEE 802.11b/g compliant	IEEE 802.11a/b/g compliant
Frequency Band	2.4 GHz	5 GHz	2.4 GHz	2.4/5 GHz
Channel Bandwidth	20 MHz	20 MHz	20 MHz	20 or 40 MHz
Number of Spatial Streams	1	1	1	1 to 4
Max. Data Rates	11 Mbps	54 Mbps	54 Mbps	600 Mbps
Data Rate Configurations	4	8	12[b]	576
Spread Spectrum	DSSS	OFDM	OFDM, DSSS	OFDM
Typical Indoor Range[c]	100 to 150 ft	30 to 50 ft	100 to 150 ft	150 to 200 ft
Typical outdoor Range[c]	200 to 300 ft	50 to 100 ft	200 to 300 ft	450 to 600 ft

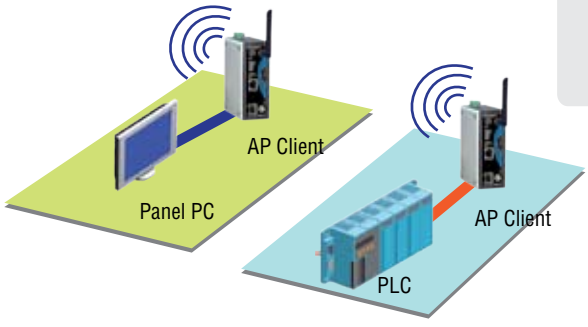
a. IEEE 802.11n is expected to be finalized in 2009, but the market has already started migrating to 802.11n networks based on Draft 2 of the 802.11n proposal.
b. IEEE 802.11b includes backwards compatibility.
c. This is a general rule of thumb that can be applied when planning a wireless network.

Operation Modes

The most common operation modes for wireless networks are AP-client mode and bridge mode. In AP-client mode, a wireless AP is required to set up a basic infrastructure service set (BSS) for wireless connectivity. The AP can be used by itself to set up a WLAN, or can be used to connect the WLAN to a wired network. In either case, all wireless communication goes through the AP. Bridge mode provides an easy way to extend a network with peer-to-peer transmission to send information between two individual APs connecting wired networks or Ethernet-enabled devices at their LAN ports.



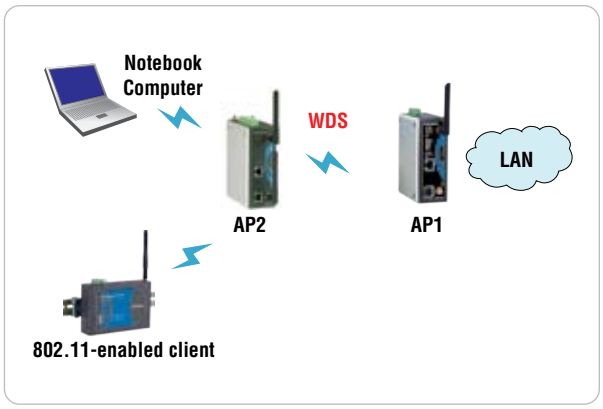
AP-Client Operation

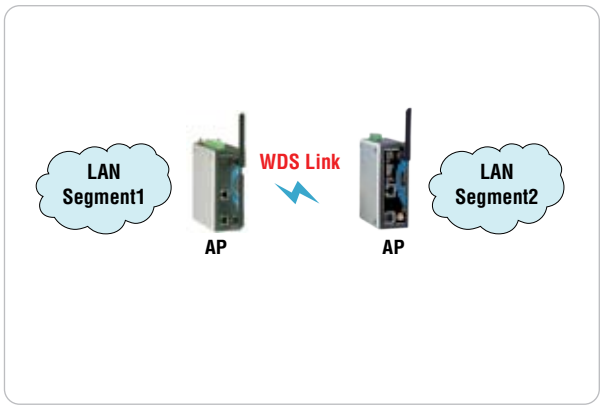


Bridge Operation

WDS

The Wireless Distribution System (WDS) provides an easy way for APs to communicate wirelessly with each other. As shown in the figure on the left below, one AP acts as a wireless access point and forwards packets to the other AP through the WDS before the packets are sent to the Ethernet LAN. In addition, two or more LAN segments can be connected wirelessly. As illustrated in the figure on the right below, a pair of wireless LAN-to-LAN bridges is used to connect two LAN segments. Since the AP is WDS-enabled, it can operate in bridge mode.

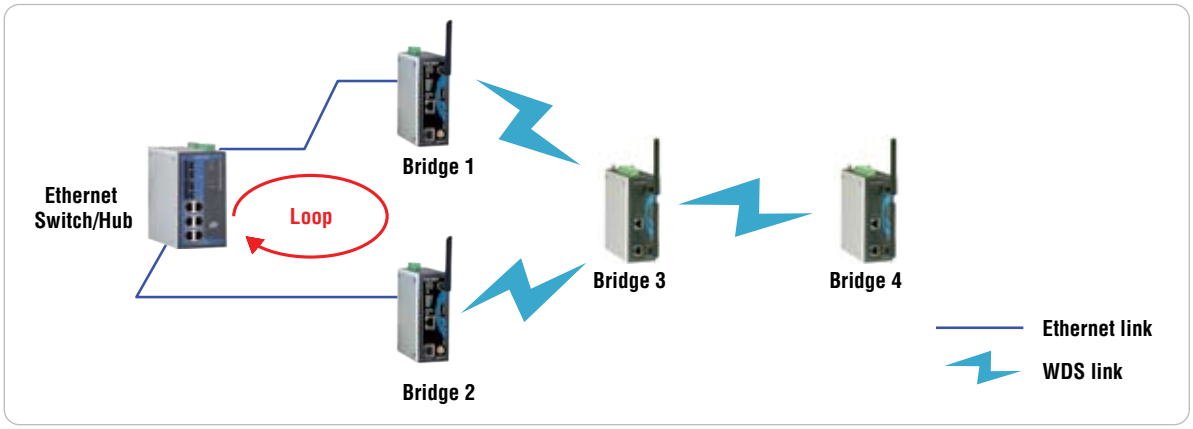




STP/RSTP

Spanning Tree Protocol (STP) was designed to help reduce link failures in a network and provide protection from loops. STP can effectively increase system reliability to allow your network to run non-stop. Networks that have a complicated architecture are prone to broadcast storms caused by unintended loops in the network. STP is part of the IEEE 802.1D standard (1998 Edition) bridge specification.

Rapid Spanning Tree Protocol (RSTP) implements the Spanning Tree algorithm and protocol defined by the IEEE 802.1w-2001 standard. RSTP is not only backwards compatible with STP, but is able to determine the topology of a bridged network much more quickly than STP.



Wireless Security

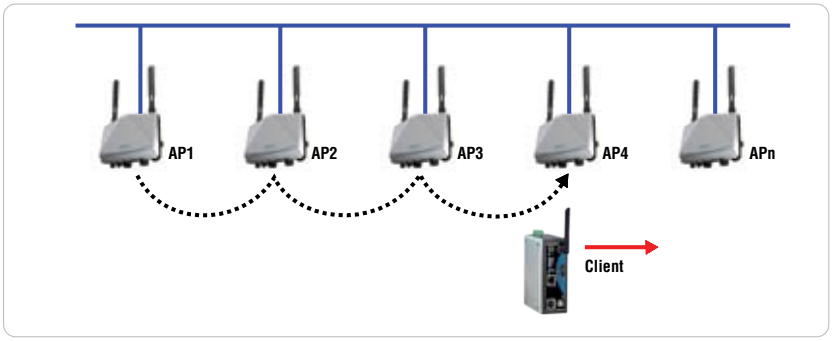
Wireless networks use radio waves, which means that your data is prone to interception by other parties. A proper protection mechanism for radio transmissions on any network is always a concern for protocol designers. The right balance between security, transparency, and cost effectiveness is important when determining the type of security to use for your WLAN. You should take into account your target environment, the security levels that your WLAN can support, and the effect that stronger security methods could have on performance. The following table summarizes implementation considerations and client requirements when using WLAN security methods.

Method	Client Support	Considerations
WEP	Built-in support on all 802.11a, basic 802.11b, and 802.11g devices	-Provides basic security -Requires manual key management
WPA	Requires WPA-enabled system and network card driver	-Provides dynamically generated keys that are periodically refreshed -Provides similar shared key user authentication -Provides robust security for small networks
WPA2	Requires WPA-enabled system and network card driver	-Provides robust security for small networks -Wireless stations may require hardware to upgrade to WAP2
802.1X	Requires WPA-enabled system and network card driver	-Provides dynamically generated keys that are backwards compatible with the original WPA

Industrial-grade Wireless LANs

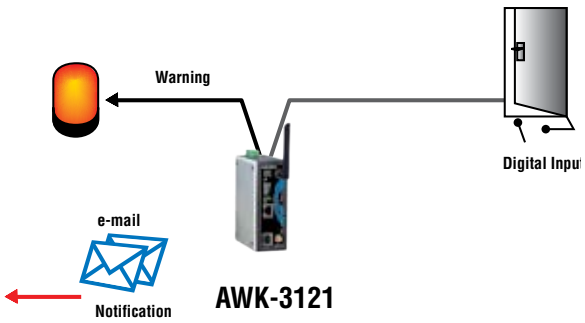
Roaming for Non-stop Connection

IEEE 802.11 technology gives networks an effective range of only a few hundred meters, which means that maintaining communication between devices that are on the move requires handing access off from one access point to another. Without an advanced roaming technology, this could result in frequent handoffs and poor performance, since reconnecting must be done every five to ten seconds in a highly mobile environment. “Roaming” is a general term in wireless communications that refers to extending connectivity service to different locations. Moxa’s Turbo Roaming™ technology provides seamless wireless connections, and enables fast Basic Service Set (BSS) transitions between APs.



Long-distance Communication

Generally speaking, IEEE 802.11 standards are not designed for outdoor use, and long-distance communication is not fully considered. When the distance between two wireless devices is increased, packets need to travel a longer distance. Communication over such a long distance can become instable, which leads to a drop in network performance. The AWK’s support for long distance communication makes it easy to configure a long-distance solution. Based on the specified distance, a proprietary algorithm developed by Moxa determines which parameters should be used to optimize performance. Practical uses of the algorithm include the deployment of long-range point-to-point and point-to-multipoint wireless networks.



DI/DO

Moxa AWK series of APs are often located at remote parts of an industrial wireless LAN, making it difficult for system administrators to know the status of such devices or monitor the surrounding environment. The traditional way of determining device status is to poll devices periodically, but this is not “real-time” enough for many modern applications, and it also wastes precious computing resources. Besides, an auxiliary sub-system may be needed to support environment monitoring, which would add an additional cost.

A more modern solution to this problem is to use industrial-grade APs that provide system maintainers with real-time alarm messages almost instantaneously when exceptions occur. In other words, warning messages are triggered actively when the events, such as link up/down and power on/off, occur. Integrated with other important sensors via digital inputs (DI), the AWK can also provide an automatic alarm mechanism. This is done by redirecting warning messages to an IP network by email or log record.

AWK series products are equipped with relay outputs (digital output, DO) that can be configured to indicate the importance of events when notifying or warning engineers in the field. In response, engineers can respond to higher priority messages quickly and with the appropriate emergency maintenance procedures.

Certified to Meet Industrial Reliability Standards

Industrial environments often involve unknown, hazardous factors that can influence the operation of Ethernet devices. In fact, some factors could cause serious disasters or the loss of life and property. Moxa’s industrial products have received UL/cUL Class 1 Division 2 and ATEX C1Z2 certifications, which were developed to indicate which industrial control and information technology equipment is suitable for hazardous locations such as maritime environments, mines, oil refineries, and other industrial settings. In addition, the environmental compliancy with EN50155 and EN50121-3-2 standards is essential for testing and determining which devices can be used safely and reliably in railway-related and on-train applications.

AWK-6222 Series

Preliminary

Industrial IEEE 802.11a/b/g outdoor dual-RF solutions

- IEEE 802.11a/b/g compliant
- Redundant power inputs and PoE
- Higher security with WEP/WPA/WPA2/802.11X and powerful filters
- Turbo Roaming™ for seamless wireless connections
- Dual-RF design for redundant wireless communication
- Wide operating temperature range and IP67-rated metal housing for hazardous environments

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The AWK-6222 outdoor dual-RF wireless AP/Bridge/Client provides a flexible solution for industrial applications in a critical environment. The AWK-6222 is rated to operate at temperatures ranging from -40 to 75°C, and its dust-tight and weatherproof design is IP67-rated, allowing you to extend existing wired networks to outdoor locations. With two independent RF modules, the AWK-6222 supports a greater variety of wireless configurations and applications. It can also increase the reliability of entire wireless network by enabling redundant wireless connections. The AWK-6222 also has two redundant DC power inputs to increase the reliability of the power supply, and can be powered via PoE.

Redundancy to Increase System Reliability

- PoE and dual DC power inputs
- Redundant dual-RF design for rapid fail-over
- Immunity against disconnection caused by radio interference
- Loading balance of wireless communication

Ruggedized Design for Critical Environment

- IP67-rate metal housing
- Waterproof and dust-tight RJ45 connections
- M12 connectors protect againt shock and vibration
- Hardened mounting kit for flexible installation outdoors

Specifications

WLAN Interface

Standards:
IEEE 802.11a/g/b for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3u for 10/100BaseT(X)
IEEE 802.3af for Power-over-Ethernet
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP

Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
64QAM @ 54 Mbps, 16QAM @ 24/36 Mbps, QPSK @ 12/18 Mbps, CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBSK@ 1 Mbps

Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
5.18 to 5.24 GHz (4 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.18 to 5.24 GHz (4 channels)
JP:
2.412 to 2.472 GHz (13 channels, OFDM)
2.412 to 2.484 GHz (14 channels, DSSS)
5.18 to 5.24 GHz (4 channels for W52)

Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/Protocol/Port-base filtering
• 64-bit and 128-bit WEP encryption, WPA/WPA2 Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES)

Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps

TX Transmit Power:
802.11b:
Typ. 18±1.5 dBm @ 1 to 11 Mbps
802.11g:
Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 16±1.5 dBm @ 36 to 48 Mbps, Typ. 15±1.5 dBm @ 54 Mbps
802.11a:
Typ. 16±1.5 dBm @ 6 to 24 Mbps, Typ. 14±1.5 dBm @ 36 to 48 Mbps, Typ. 13±1.5 dBm @ 54 Mbps

RX Sensitivity:
802.11b:
-92 dBm @ 1 Mbps, -90 dBm @ 2 Mbps, -88 dBm @ 5.5 Mbps, -84 dBm @ 11 Mbps
802.11g:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
802.11a:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, RTP

AP-only Protocols: ARP, BOOTP, DHCP, dynamic VLAN-Tags for 802.1X-Clients, STP/RSTP (IEEE 802.1D/w)

Interface

Default Antenna: 5 dBi, 2.4 GHz omni-directional antenna, N-type (male)

Connector for External Antenna: N-type (female)

LAN Port: 10/100BaseT(X) auto negotiation speed (waterproof RJ45-type)

Console Port: RS-232 (waterproof RJ45-type)

LED Indicators: PWR, FAULT, STATE, WLAN1, WLAN2, LAN1, LAN2

Alarm Contact (Digital Output, M12 connector): 1 relay output with current carrying capacity of 1A @ 24 VDC

Digital Inputs (M12 connector): 2 electrically isolated inputs
- +13 to +30 V for state "1"
- +3 to -30 V for state "0"
- Max. input current: 8 mA

Physical Characteristics

Housing: Metal, IP67 protection

Weight: 1.22 kg

Dimensions: 224 x 147.7 x 66.5 mm (8.82 x 5.82 x 2.62 in)

Installation: Wall mounting (standard), DIN-Rail mounting (optional), pole mounting (optional)

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)

Connector: M12 connector with A-coding

Reverse Polarity Protection: Present

Regulatory Approvals

Safety: EN60950-1, UL60950-1

Radio: EN300 328, EN301 893, ARIB STD-33/T66/T71 (Japan)

EMC: EN301 489-1/-17, FCC Part 15

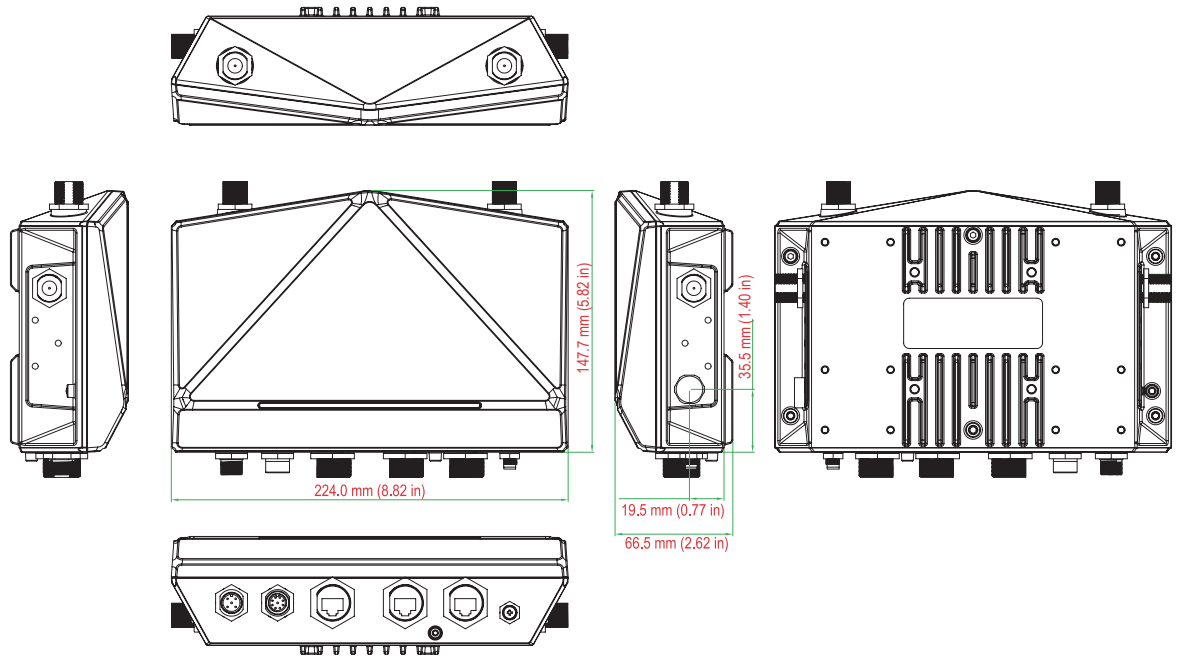
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Available Models

AWK-6222-US-T: IEEE 802.11a/b/g outdoor dual-RF AP/Bridge/Client, US band, -40 to 75°C operating temperature

AWK-6222-EU-T: IEEE 802.11a/b/g outdoor dual-RF AP/Bridge/Client, EU band, -40 to 75°C operating temperature

AWK-6222-JP-T: IEEE 802.11a/b/g outdoor dual-RF AP/Bridge/Client, JP band, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

M12A-5P-IP68: Field-installable A-coded screw-in sensor connector, male

M12A-8P-IP68: Field-installable A-coded screw-in 8-pin connector, female

PLG-WPRJ: Field-installable RJ-type plug

DK-DC50131: Din-Rail mounting kit, 50 x 131 mm

PK-DC2DOF: Pole-mounting kit

CRF-N0429N-3M: CFD400 cable, N-type male to N-type male, 3 meters

Note: Please visit Moxa's website for a complete list of optional accessories available for these products.

AWK-4121 Series

Industrial IEEE 802.11a/b/g outdoor wireless AP/Bridge/Client

- IEEE 802.11a/b/g compliant
- Redundant power inputs and PoE
- Higher security with WEP/WPA/WPA2/802.11X and powerful filter
- Turbo Roaming™ for seamless wireless connections
- Long-distance communication support
- Wide operating temperature range and IP67-rated metal housing for hazardous environments

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The AWK-4121 outdoor wireless AP/Bridge/Client is an ideal 3-in-1 solution for industrial applications that are hard to wire, too expensive to wire, or use mobile equipment that connects to a TCP/IP network. The AWK-4121 can operate at temperatures ranging from -40 to 75°C, and its dust-tight and weatherproof design is IP67-rated and allows you to set up a WLAN, or extend existing wired networks to outdoor locations. In addition, the AWK-4121 is equipped with detachable antennas so it can give you the flexibility of choosing your own special-purpose antennas. The AWK-4121's two redundant DC power inputs increases the reliability of the power supply. It can also be powered via PoE and is easy to deploy.

Ruggedized Design for Critical Environments

- IP67-rated metal housing
- Waterproof and dust-tight RJ45 connectors
- M12 connectors protect against shock and vibration
- Hardened mounting kit for flexible installation outdoors

Specifications for Industrial-grade Applications

- Turbo Roaming™ for rapid handover during client roaming
- Long-distance data transmission over 10 km
- Integrated DI/DO for on-site monitoring and warning
- Status LED indicators for on-site monitoring and diagnosis

Specifications

WLAN Interface

Standards:
IEEE 802.11a/g/b for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3u for 10/100BaseT(X)
IEEE 802.3af for Power-over-Ethernet
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP

Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
64QAM @ 54 Mbps, 16QAM @ 24/36 Mbps, QPSK @ 12/18 Mbps, CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBSK@ 1 Mbps

Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
5.18 to 5.24 GHz (4 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.18 to 5.24 GHz (4 channels)
JP:
2.412 to 2.472 GHz (13 channels, OFDM)
2.412 to 2.484 GHz (14 channels, DSSS)
5.18 to 5.24 GHz (4 channels for W52)

Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/Protocol/Port-base filtering
• 64-bit and 128-bit WEP encryption, WPA /WPA2 Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES)

Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps

TX Transmit Power:
802.11b:
Typ. 18±1.5 dBm @ 1 to 11 Mbps
802.11g:
Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 16±1.5 dBm @ 36 to 48 Mbps, Typ. 15±1.5 dBm @ 54 Mbps
802.11a:
Typ. 16±1.5 dBm @ 6 to 24 Mbps, Typ. 14±1.5 dBm @ 36 to 48 Mbps, Typ. 13±1.5 dBm @ 54 Mbps

RX Sensitivity:
802.11b:
-92 dBm @ 1 Mbps, -90 dBm @ 2 Mbps, -88 dBm @ 5.5 Mbps, -84 dBm @ 11 Mbps
802.11g:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
802.11a:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, RTP

AP-only Protocols: ARP, BOOTP, DHCP, dynamic VLAN-Tags for 802.1X-Clients, STP/RSTP (IEEE 802.1D/w)

Interface

Default Antenna: 5 dBi, 2.4 GHz omni-directional antenna, N-type (male)

Connector for External Antenna: N-type (female)

LAN Port: 10/100BaseT(X) auto negotiation speed (waterproof RJ45-type)

Console Port: RS-232 (waterproof RJ45-type)

LED Indicators: PWR, FAULT, STATE, WLAN, LAN

Alarm Contact (Digital Output, M12 connector): 1 relay output with current carrying capacity of 1 A @ 24 VDC

Digital Inputs (M12 connector): 2 electrically isolated inputs
- +13 to +30 V for state "1"
- +3 to -30 V for state "0"
- Max. input current: 8 mA

Physical Characteristics

Housing: Metal, IP67 protection

Weight: 1.2 kg

Dimensions: 224 x 147.7 x 66.5 mm (8.82 x 5.82 x 2.62 in)

Installation: Wall mounting (standard), DIN-Rail mounting (optional), pole mounting (optional)

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)

Connector: M12 connector with A-coding

Reverse Polarity Protection: Present

Regulatory Approvals

Safety: EN60950-1, UL60950-1

Radio: EN300 328, EN301 893, ARIB STD-33/T66/T71 (Japan)

EMC: EN301 489-1/-17, FCC Part 15, EN55022/55024, IEC61000-6-2/-4

Environmental/EMC Compliancy: EN50155, EN50121-1/-4, Directive 72/245/EEC (for e/M mark)

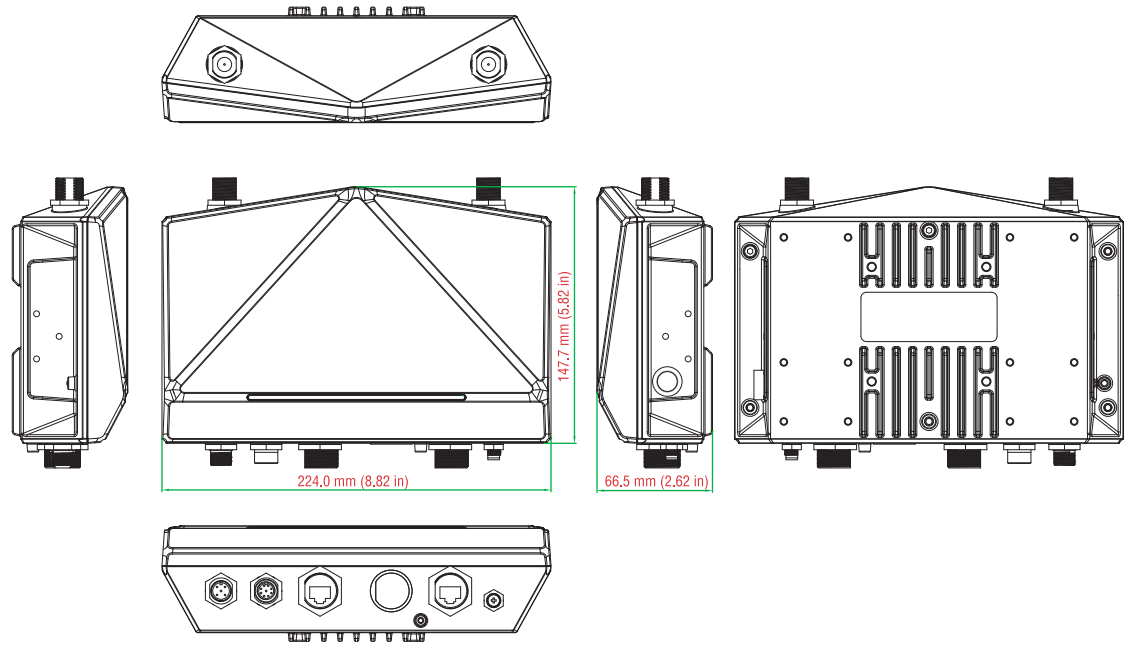
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Available Models

AWK-4121-US-T: IEEE 802.11a/b/g outdoor wireless AP/Bridge/Client, US band, -40 to 75°C operating temperature

AWK-4121-EU-T: IEEE 802.11a/b/g outdoor wireless AP/Bridge/Client, EU band, -40 to 75°C operating temperature

AWK-4121-JP-T: IEEE 802.11a/b/g outdoor wireless AP/Bridge/Client, JP band, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

M12A-5P-IP68: Field-installable A-coded screw-in sensor connector, male

M12A-8P-IP68: Field-installable A-coded screw-in 8-pin connector, female

PLG-WPRJ: Field-installable RJ-type plug

DK-DC50131: Din-Rail mounting kit, 50 x 131 mm

PK-DC2DOF: Pole-mounting kit

CRF-N0429N-3M: CFD400 cable, N-type male to N-type male, 3 meters

Note: Please visit Moxa's website for a complete list of optional accessories available for these products.

AWK-5222 Series

Industrial IEEE 802.11a/b/g dual-RF solutions

- IEEE 802.11a/b/g compliant
- Redundant power inputs and PoE
- Higher security with WEP/WPA/WPA2/802.11X and powerful filters
- Turbo Roaming™ for seamless wireless connections
- Dual-RF design for redundant wireless communication

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The AWK-5222 dual-RF wireless AP/Bridge/Client provides a flexible and highly realiable solution for your industrial wireless networks. The AWK-5222 is rated to operate at temperatures ranging from 0 to 60°C for standard models and -40 to 75°C for extended temperature models, and it is built rugged enough for industrail applications. With two independent RF modules, the AWK-5222 supports a greater variety of wireless configurations and applications, and the redundant wireless connections increase the reliability of entire wireless network. The AWK-5222's two DC power inputs makes the power supply more reliable, and it can also be powered via PoE for easier deployment.

Redundancy to Increase System Reliability

- Dual DC power inputs and PoE
- Redundant dual-RF design for rapid fail-over
- Immunity against disconnection caused by radio interference
- Loading balance of wireless communication

Advanced Security

- 64-bit and 128-bit WEP (Wired Equivalent Privacy)
- Enable/disable SSID broadcasts
- Power filters for access control
- IEEE 802.1X/RADIUS supported
- WPA/WPA2/802.11i supported

Specifications

WLAN Interface

Standards:
IEEE 802.11a/g/b for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3u for 10/100BaseT(X)
IEEE 802.3af for Power-over-Ethernet
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP

Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
64QAM @ 54 Mbps, 16QAM @ 24/36 Mbps, QPSK @ 12/18 Mbps, CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBSK@ 1 Mbps

Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
5.18 to 5.24 GHz (4 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.18 to 5.24 GHz (4 channels)
JP:
2.412 to 2.472 GHz (13 channels, OFDM)
2.412 to 2.484 GHz (14 channels, DSSS)
5.18 to 5.24 GHz (4 channels for W52)

Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/Protocol/Port-base filtering
• 64-bit and 128-bit WEP encryption, WPA /WPA2 Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES)

Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps

TX Transmit Power:
802.11b:
Typ. 18±1.5 dBm @ 1 to 11 Mbps
802.11g:
Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 16±1.5 dBm @ 36 to 48 Mbps, Typ. 15±1.5 dBm @ 54 Mbps
802.11a:
Typ. 16±1.5 dBm @ 6 to 24 Mbps, Typ. 14±1.5 dBm @ 36 to 48 Mbps, Typ. 13±1.5 dBm @ 54 Mbps

RX Sensitivity:
802.11b:
-92 dBm @ 1 Mbps, -90 dBm @ 2 Mbps, -88 dBm @ 5.5 Mbps, -84 dBm @ 11 Mbps
802.11g:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
802.11a:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, RTP

AP-only Protocols: ARP, BOOTP, DHCP, dynamic VLAN-Tags for 802.1X-Clients, STP/RSTP (IEEE 802.1D/w)

Interface

Default Antenna: 2 dBi, dual-band omni-directional antenna, RP-SMA (male)

Connector for External Antenna: RP-SMA (female)

LAN Port: 10/100BaseT(X) auto negotiation speed (RJ45-type)

Console Port: RS-232 (RJ45-type)

LED Indicators: PWR1, PWR2, PoE, FAULT, STATE, WLAN1, WLAN2, 10M, 100M

Alarm Contact (Digital Output): 1 relay output with current carrying capacity of 1 A @ 24 VDC

Digital Inputs: 2 electrically isolated inputs
- +13 to +30 V for state "1"
- +3 to -30 V for state "0"
- Max. input current: 8 mA

Physical Characteristics

Housing: Metal, IP30 protection

Weight: 880 g

Dimensions: 62.05 x 135 x 105 mm (2.44 x 5.31 x 4.13 in)

Installation: DIN-Rail mounting (standard), Wall mounting (optional)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)

Connector: 10-pin removable terminal block

Reverse Polarity Protection: Present

Regulatory Approvals

Safety: EN60950-1, UL60950-1

Radio: EN300 328, EN301 893, ARIB STD-33/T66/T71 (Japan)

EMC: EN301 489-1/-17, FCC Part 15

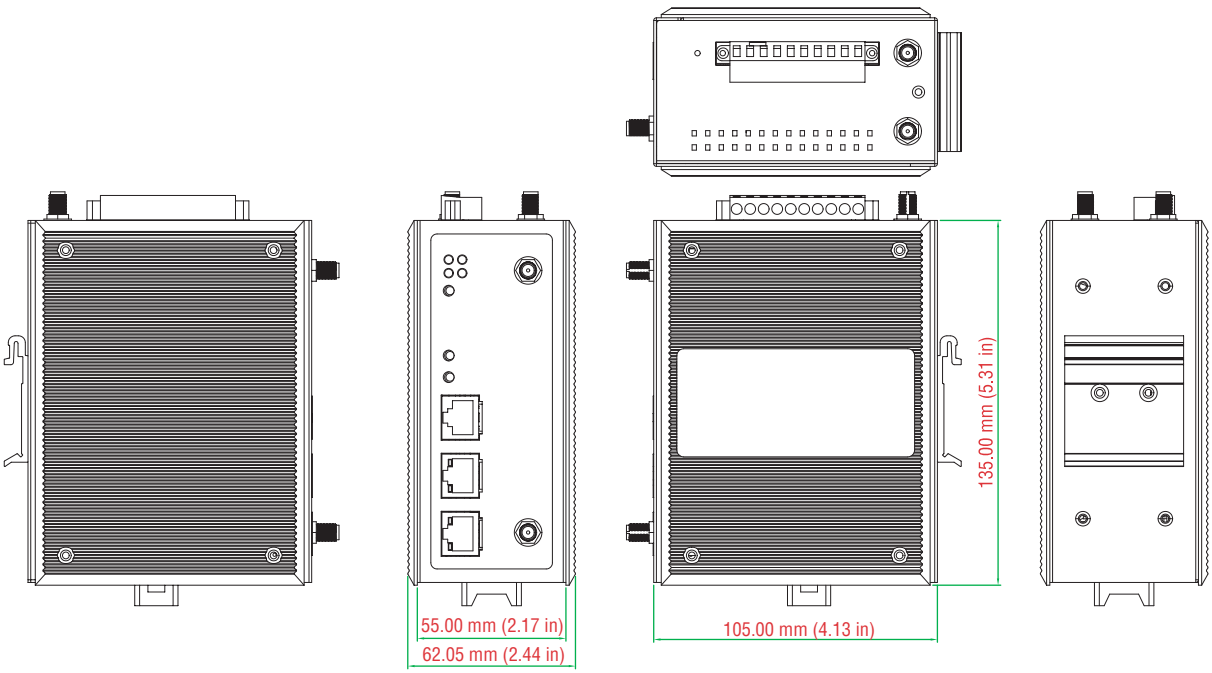
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Available Models

AWK-5222-US: IEEE 802.11a/b/g dual-RF AP/Bridge/Client, US band, 0 to 60°C operating temperature

AWK-5222-EU: IEEE 802.11a/b/g dual-RF AP/Bridge/Client, EU band, 0 to 60°C operating temperature

AWK-5222-JP: IEEE 802.11a/b/g dual-RF AP/Bridge/Client, JP band, 0 to 60°C operating temperature

AWK-5222-US-T: IEEE 802.11a/b/g dual-RF AP/Bridge/Client, US band, -40 to 75°C operating temperature

AWK-5222-EU-T: IEEE 802.11a/b/g dual-RF AP/Bridge/Client, EU band, -40 to 75°C operating temperature

AWK-5222-JP-T: IEEE 802.11a/b/g dual-RF AP/Bridge/Client, JP band, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

WK-46: Wall mounting kit

DR-75-24: 75W/3.2A DIN-Rail 24 VDC power supply with universal 85 to 264 VAC input

CRF- N0117SA-3M: CFD200 cable, N-type (male) to RP-SMA (male), 3 meters

ANT-WSB-ANF-09: 2.4 GHz, omni-directional, 9 dBi Antenna, N-type female connector

ANT-WSB5-ANF-12: 5 GHz, omni-directional, 12 dBi, N-type female connector

Note: Please visit Moxa's website for a complete list of optional accessories available for these products.

AWK-3121 Series

Industrial IEEE 802.11a/b/g wireless AP/Bridge/Client

- IEEE 802.11a/b/g compliant
- Power input by redundant 24 VDC power inputs or Power-over-Ethernet
- Powerful security with WPA/WPA2/802.11X filters
- Turbo Roaming™ for seamless wireless connection
- Long-distance communication support
- STP/RSTP support to increase reliability
- DIN-Rail or wall mounting ability
- IP30 protected high-strength metal housing
- -40 to 75°C operating temperature range (-T model)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

Are your industrial applications hard to wire, or are your wiring costs out of control? Are you already using mobile equipment that connects over an IP network? If so, then what you need is the AWK-3121 Access-Point/Bridge/Client. The AWK-3121 is rated to operate at temperatures ranging from 0 to 60°C for standard models and -40 to 75°C for wide temperature models, and is rugged enough for any harsh industrial environment. Installation is easy, with either DIN-Rail mounting or distribution boxes. The DIN-Rail mounting capability, wide operating temperature range, and IP30 housing with LED indicators make the AWK-3121 a convenient yet reliable solution for any industrial wireless application.

Advanced Security

- 64-bit and 128-bit WEP (Wired Equivalent Privacy)
- Enable/disable SSID broadcasts
- WPA/WPA2 (Wi-Fi Protected Access) and 802.11i support
- IEEE802.1X/RADIUS support
- Powerful filters for access control

Specifications for Industrial-grade Applications

- Turbo Roaming™ for rapid handover during client roaming
- Long-distance data transmission over 10 km
- Integrated DI/DO for on-site monitoring and warning
- Signal strength LEDs for easy deployment and antenna alignment

Specifications

WLAN Interface

Standards:
IEEE 802.11a/g/b for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3u for 10/100BaseT(X)
IEEE 802.3af for Power-over-Ethernet
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP

Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
64QAM @ 54Mbps, 16QAM @ 24/36Mbps, QPSK @ 12/18Mbps, CCK @ 11/5.5Mbps, DQPSK @ 2Mbps, DBSK@ 1Mbps

Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
5.18 to 5.24 GHz (4 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.18 to 5.24 GHz (4 channels)
JP:
2.412 to 2.472 GHz (13 channels, OFDM)
2.412 to 2.484 GHz (14 channels, DSSS)
5.18 to 5.24 GHz (4 channels for W52)

Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/Protocol/Port-base filtering
• 64-bit and 128-bit WEP encryption, WPA /WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES)

Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps

TX Transmit Power:
802.11b:
Typ. 18±1.5 dBm @ 1 to 11 Mbps
802.11g:
Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 16±1.5 dBm @ 36 to 48 Mbps, Typ. 15±1.5 dBm @ 54 Mbps
802.11a:
Typ. 16±1.5 dBm @ 6 to 24 Mbps, Typ. 14±1.5 dBm @ 36 to 48 Mbps, Typ. 13±1.5 dBm @ 54 Mbps

RX Sensitivity:
802.11b:
-92 dBm @ 1 Mbps, -90 dBm @ 2 Mbps, -88 dBm @ 5.5 Mbps, -84 dBm @ 11 Mbps
802.11g:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
802.11a:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, RTP

AP-only Protocols: ARP, BOOTP, DHCP, dynamic VLAN-Tags for 802.1X-Clients, STP/RSTP (IEEE 802.1D/w)

Interface

Default Antenna: 2 dBi dual-band omni-directional antenna, RP-SMA (male)

Connector: RP-SMA (female)

RJ45 Port: 10/100BaseT(X) auto negotiation speed

Console for External Antenna: RS-232 (RJ45-type)

LED Indicators: PWR1, PWR2, PoE, FAULT, STATE, signal strength, CLIENT MODE, BRIDGE MODE, WLAN, 10M, 100M

Alarm Contact: 1 relay output with current carrying capacity of 1A @ 24 VDC

Digital Inputs: 2 electrically isolated inputs
- +13 to +30 V for state "1"
- +3 to -30 V for state "0"
- Max. input current: 8 mA

Physical Characteristics

Housing: Metal, providing IP30 protection

Weight: 850 g

Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)

Connection: 10-pin removable terminal block

Reverse Polarity Protection: Present

Regulatory Approvals

Safety: EN60950-1, UL60950-1

Radio: EN300 328, EN301 893, ARIB STD-33/T66/T71 (Japan)

EMC: EN301 489-1/-17, FCC Part 15, EN55022/55024, IEC61000-6-2/-4

Environmental/EMC Compliancy: EN50155, EN50121-1/-4, Directive 72/245/EEC (for e/M mark)

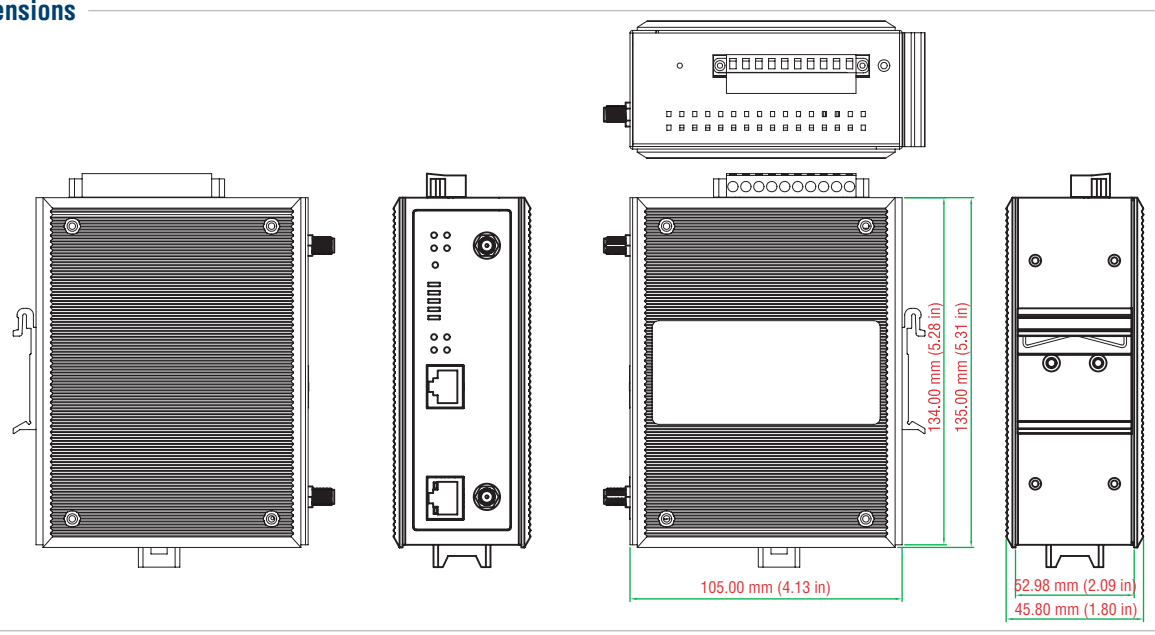
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Available Models

AWK-3121-US: IEEE 802.11a/b/g wireless AP/Bridge/Client, US band, 0 to 60°C operating temperature

AWK-3121-EU: IEEE 802.11a/b/g wireless AP/Bridge/Client, EU band, 0 to 60°C operating temperature

AWK-3121-JP: IEEE 802.11a/b/g wireless AP/Bridge/Client, JP band, 0 to 60°C operating temperature

AWK-3121-US-T: IEEE 802.11a/b/g wireless AP/Bridge/Client, US band, -40 to 75°C operating temperature

AWK-3121-EU-T: IEEE 802.11a/b/g wireless AP/Bridge/Client, EU band, -40 to 75°C operating temperature

AWK-3121-JP-T: IEEE 802.11a/b/g wireless AP/Bridge/Client, JP band, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

WK-46: Wall mounting kit

DR-75-24: 75W/3.2A DIN-Rail 24 VDC power supply with universal 85 to 264 VAC input

CRF- N0117SA-3M: CFD200 cable, N-type (male) to RP-SMA (male), 3 meters

ANT-WSB-ANF-09: 2.4 GHz, omni-directional antenna, 9dBi, N-type (female) connector

ANT-WSB5-ANF-12: 5 GHz, omni-directional antenna, 12 dBi, N-type (female) connector

Note: Please visit Moxa's website for a complete list of optional accessories available for these products.

NPort® W2004

4-port RS-232/422/485 IEEE 802.11b/g wireless device server

- Link any serial device to an IEEE 802.11b/g network
- 460.8 Kbps baudrate for RS-232/422/485 transmissions
- Web-based configuration using built-in Ethernet or WLAN
- Windows real COM and Linux real TTY drivers provided
- Real COM, TCP Server, TCP Client, and UDP modes
- Enhanced remote configuration with HTTPS, SSH

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

802.11b/g Wireless Connectivity to Serial Devices

The NPort® W2004 wireless device server provides a convenient means of reducing the number of cables for hard-to-wire applications. Both Infrastructure and Ad-Hoc modes are supported, and the NPort® W2004 can connect to access points or another NPort® W2004 located up to 300 meters away.

Works with Existing Software, Saving Time and Money

Field-proven Windows real COM and Linux real TTY drivers are provided for the NPort® W2004, ensuring that existing PC software will work with your wireless LAN infrastructure. In addition, the NPort® W2004 supports TCP Server, TCP Client, and UDP operation modes that allow IP-based software to use the IP address and TCP port number to access devices directly.

Secure Remote Management and Configuration with SSH/SSL

The NPort® W2004 supports several functions to help prevent unauthorized access to your wireless LAN. In addition to WEP protection, IP filtering, and password protection, the NPort® W2004 also supports SSH and SSL to thwart hacker attacks. Using web browsers that support https (Internet Explorer, for example) provides secure access by browser to your wireless LAN. In addition, using terminal emulators that support SSH (PuTTY, for example) provides secure Telnet access.

Specifications

WLAN Interface

Standards: 802.11b/g

Radio Frequency Type: DSSS/OFDM

Security: 64-bit/128-bit data encryption with WEP

Transmission Rates: 54 Mbps (max.) with auto fallback (54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1 Mbps)

Transmission Distance: Up to 300 meters (at 12 Mbps in open areas)

TX Transmit Power:
802.11b: 20 dBm maximum
802.11g: 18 dBm maximum

Rx Sensitivity: -80 dBm

Antenna Connector: Reverse SMA

Network Modes: Infrastructure, Ad-Hoc

LAN Interface

Ethernet: 10/100 Mbps, RJ45 connector, Auto MDI/MDIX

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 4

Serial Standards: RS-232/422/485 (RJ45 connector)

Console Port: RS-232 console port on the front panel

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, DTR/DSR

Baudrate: 50 bps to 460.8 Kbps

Serial Data Log: 64 KB

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, SSH, HTTPS

Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility

Secure Configuration Options: HTTPS, SSH

Utilities: NPort® Search Utility and NPort® Windows Driver manager

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: 2.4.x/2.6.x

Physical Characteristics

Housing: SECC sheet metal (1 mm), providing IP30 protection

Weight: 1730 g

Dimensions:
Without antenna: 45.8 x 135 x 105 mm (1.80 x 5.31 x 4.13 in)
With antenna: 45.8 x 204 x 142 mm (3.94 x 8.03 x 5.59 in)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 85°C (-4 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 685 mA @ 12 V, 340 mA @ 24 V, 185 mA @ 48 V

Regulatory Approvals

Safety: UL (UL60950-1), TÜV (EN60950-1)

Radio: CE (ETSI EN 300 328)

EMC: CE (EN55022 and EN55024 Class A, ETSI EN 301 489-17, ETSI EN 301 489-1)

EMI: FCC (Part 15 Subpart B Class A, Subpart C)

Reliability

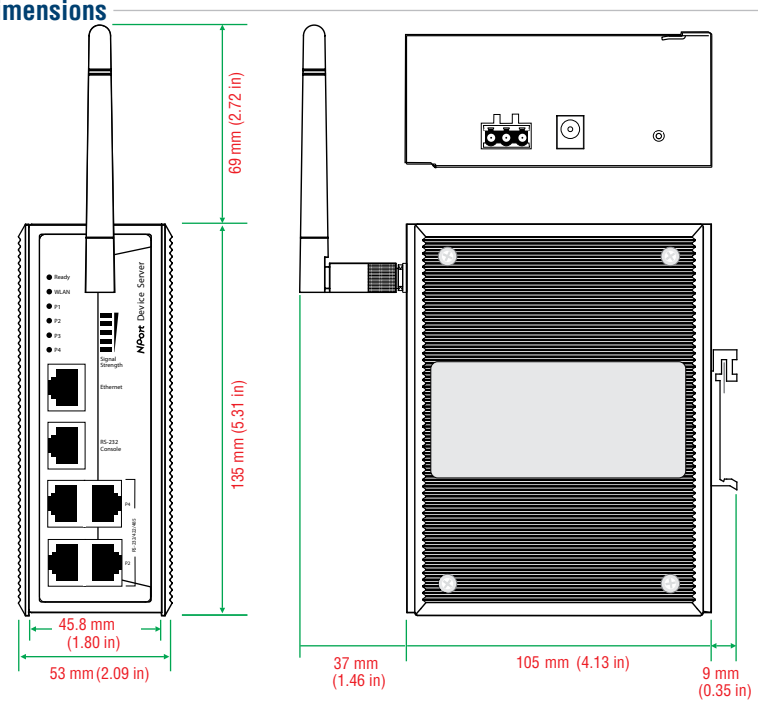
MTBF (mean time between failures): 81501 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



RJ45 RS-232/422/485 port

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DSR	–	–
2	RTS	TxD+	–
3	GND	GND	GND
4	TxD	TxD-	–
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	–	–
8	DTR	–	–

Ordering Information

Available Models

NPort® W2004-US: 4-port RS-232/422/485 wireless device server with 802.11b/g WLAN, antenna, US band, US plug

NPort® W2004-EU: 4-port RS-232/422/485 wireless device server with 802.11b/g WLAN, antenna, Euro band, Euro plug

NPort® W2004-CN: 4-port RS-232/422/485 wireless device server with 802.11b/g WLAN, antenna, Euro band, US plug, CCC

NPort® W2004-UK: 4-port RS-232/422/485 wireless device server with 802.11b/g WLAN, antenna, Euro band, UK plug

NPort® W2004-SAA: 4-port RS-232/422/485 wireless device server with 802.11b/g WLAN, antenna, Euro band, Australia plug

Package Checklist

- NPort® W2004 wireless device server
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-RJ45M9-150: RJ45 (8 pins) to DB9 male serial port cable, 150 cm
- Power adaptor
- Antenna
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Optional Accessories (can be purchased separately)

Serial Cables and Adaptors: See page A-6 for details

NPort® W2150/2250 Plus

1 and 2-port RS-232/422/485 IEEE 802.11a/b/g wireless device servers

- Link any serial device to an IEEE 802.11a/b/g network
- 921.6 Kbps baudrate for RS-232/422/485 transmissions
- Web-based configuration using built-in Ethernet or WLAN
- Enhanced remote configuration with HTTPS, SSH
- Secure data access with WEP, WPA, WPA2
- Built-in WLAN site survey tool
- Wireless roaming with user-defined signal strength threshold
- Off-line port buffering and serial data log
- Dual power inputs (1 power jack, 1 terminal block)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

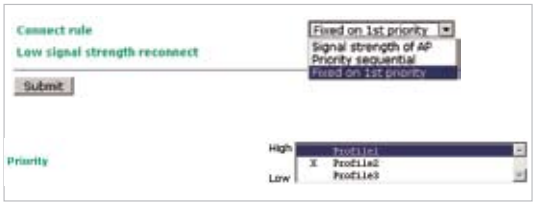
The NPort® W2150 Plus and W2250 Plus are the ideal choice for connecting your serial devices, such as PLCs, meters, and sensors, to a wireless LAN. Your communications software will be able to access the serial devices from anywhere over a wireless LAN. Moreover, the wireless device servers require fewer cables and are ideal for applications that involve difficult wiring situations. In Infrastructure Mode or Ad-Hoc Mode, the NPort® W2150 Plus and NPort® W2250 Plus can connect to Wi-Fi networks at offices and factories to allow users to move, or "roam," between several APs (Access Points), and offer an excellent solution for devices that are frequently moved from place to place.

802.11a/b/g Wireless Connectivity to Serial Devices

Wireless device servers require fewer cables and are ideal for applications that involve difficult wiring situations. In Infrastructure Mode or Ad-Hoc Mode, the NPort® W2150 Plus and NPort® W2250 Plus can communicate with any host computer through an access point, or with another NPort® W2150 Plus or NPort® W2250 Plus located up to 100 meters away.

Wireless Roaming Function

Wi-Fi networks at offices and factories allow users to move, or "roam," between several APs (Access Points). The NPort® W2150 Plus and NPort® W2250 Plus include a "Connect Rule" setting to allow wireless roaming.



The "Connect rule" field is only available in Infrastructure Mode and is used to specify the NPort®'s roaming behavior. When "Signal strength of AP" is selected, if more than one AP is detected, the NPort® will connect to the AP that has the highest signal strength, regardless of priority as set in the Priority field. When "Priority sequential" is selected, the NPort® will always try to connect to APs in order of priority, as set in the Priority field, regardless of signal strength. When "Fixed on 1st priority" is selected, the NPort® is only allowed to connect to the first priority AP, as set in the "Priority" field.

This "Priority" field is only available in Infrastructure Mode, and is used to set the priorities of the three available profiles.

Off-line Port Buffering and Serial Data Log for Each Port

For mission-critical applications, data from the serial device must not be lost if the wireless connection goes down. The NPort® W2150 Plus and NPort® W2250 Plus are designed to continue operating if the wireless connection is disconnected temporarily. When the wireless connection is retraining, or if the connection fails, the serial data from the serial device will be queued in the 10 MB port buffer built into the device server. As soon as the wireless connection returns to normal, the data stored in the buffer will be sent to its destination. In addition, a serial data log can be enabled to make troubleshooting easier.

The serial data log buffer for both the NPort® W2150 Plus and NPort® W2250 Plus is 64 KB per port.

Built-in WLAN Site Survey Tool

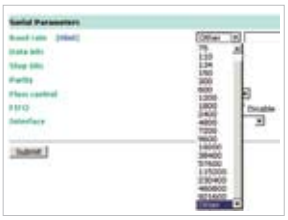
The NPort® W2150 Plus and NPort® W2250 Plus both have a built-in WLAN site survey tool. Additional software is NOT required to complete the site survey.

The purpose of conducting a WLAN site survey is to determine how many access points are required, and where the access points should be placed. For most implementations, the number and placement of access points is designed to guarantee a minimum data rate. With wireless systems, it is often necessary to perform a WLAN site survey before installing the access points in order to understand how radio waves behave within the facility.

Secure Remote Management and Configuration with SSH/SSL

Unauthorized access is one of the biggest headaches for system managers. In addition to IP filtering and password protection, the NPort® W2150 Plus and NPort® W2250 Plus also support SSH and SSL to provide protection from hackers. To transmit control messages securely, open the web console using a web browser that supports https (Internet Explorer, for example). You may also open the serial or Telnet console, such as PuTTY, using a terminal emulator that supports SSH.

Select "Any Baudrate" between 50 bps and 921.6 Kbps



Most device servers only support a fixed number of serial baudrates. However, some applications require special baudrates, such as 250 Kbps or 500 Kbps. With the NPort® W2150 Plus and NPort® W2250 Plus, you can enter any baudrate between 50 and 921.6 Kbps.

If your device's baudrate is not a standard baudrate, select "other" from the drop-down list and then enter the baudrate.

Specifications

WLAN Interface

Standards: 802.11a/b/g

Radio Frequency Type: DSSS/OFDM

Security:
• WEP: 64-bit/128-bit data encryption
• WPA, WPA2, 802.11i: Enterprise mode and Pre-Share Key (PSK) mode
• Encryption: 128-bit TKIP/AES-CCMP EAP-TLS, PEAP/GTC, PEAP/MD5, PEAP/MSCHAPV2, EAP-TTLS/PAP, EAP-TTLS/CHAP, EAP-TTLS/MSCHAP, EAP-TTLS/MSCHAPV2, EAP-TTLS/EAP-MSCHAPV2, EAP-TTLS/EAP-GTC, EAP-TTLS/EAP-MD5, LEAP

Transmission Rates:
802.11a: 54 Mbps
802.11b: 11 Mbps
802.11g: 54 Mbps (max.) with auto fallback (54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1 Mbps)

Transmission Distance: Up to 100 meters (in open areas)

TX Transmit Power:
802.11a: 14 dBm (typical)
802.11b: 17 dBm (typical)
802.11g: 15 dBm (typical)

Rx Sensitivity: -80 dBm

Antenna Connector: Reverse SMA

Network Modes: Infrastructure, Ad-Hoc

LAN Interface

Ethernet: 10/100 Mbps, RJ45 connector, Auto MDI/MDIX

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports:
NPort® W2150 Plus: 1
NPort® W2250 Plus: 2

Serial Standards: RS-232/422/485 (DB9 male connector)

Off-line Port Buffering:
NPort® W2150 Plus: 20 MB
NPort® W2250 Plus: 10 MB

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF

Baudrate: 50 bps to 921.6 Kbps

Serial Data Log: 64 KB

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, SNTP, SSH, HTTPS

Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility

Management: SNMP MIB-II

Secure Configuration Options: HTTPS, SSH

Utilities: NPort® Search Utility and NPort® Windows Driver manager

Windows Real COM Drivers: Windows 95, 98, ME, NT, 2000, XP x86/x64, 2003 x86/x64, Vista x86/x64, 2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i

Linux Real TTY Drivers: 2.4.x/2.6.x

Physical Characteristics

Housing: Aluminum sheet metal (1 mm)

Weight: 780 g

Dimensions:
Without ears or antenna: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
With ears, without antenna: 100 x 111 x 26 mm (3.94 x 4.37 x 1.02 in)
Antenna Length: 109 mm (4.29 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 85°C (-4 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 560 mA @ 12 V, 294 mA @ 24 V, 162 mA @ 48 V

Regulatory Approvals

Safty: UL (UL60950-1), TUV (EN60950-1)

Radio: CE (ETSI EN 301 893, ETSI EN 300 328), ARIB RCR STD-33, ARIB STD-66

EMC: CE (EN55022 and EN55024 Class A, ETSI EN 301 489-17, ETSI EN 301 489-1)

EMI: FCC Part 15 (Subpart B Class A, Subpart C, Subpart E), VCCI

Reliability

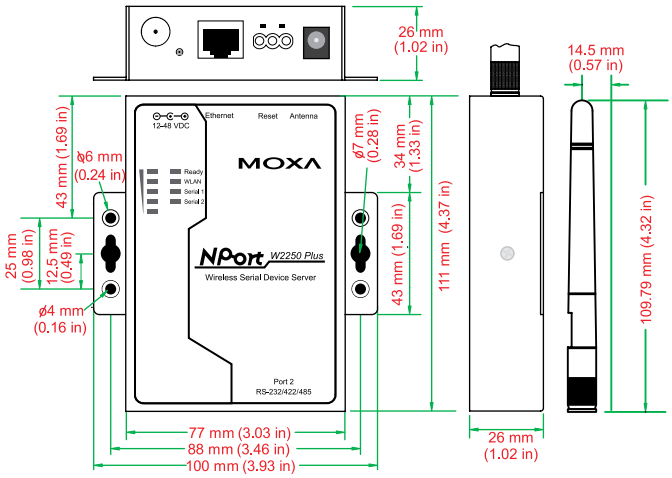
MTBF (mean time between failures):
NPort® W2150 Plus: 352547 hrs
NPort® W2250 Plus: 352034 hrs

Warranty

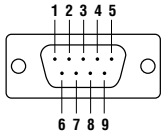
Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Pin Assignment, DB9 Male



PIN	RS-232	RS-422/485-4W	RS-485-2W
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–
9	–	–	–

Ordering Information

Available Models

NPort® W2150 Plus-US: 1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, US band, US plug, 0 to 55°C operating temperature
NPort® W2150 Plus-EU: 1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, Euro plug, 0 to 55°C operating temperature
NPort® W2150 Plus-CN: 1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, US plug, CCC, 0 to 55°C operating temperature
NPort® W2150 Plus-UK: 1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, UK plug, 0 to 55°C operating temperature
NPort® W2150 Plus-SAA: 1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, Australia plug, 0 to 55°C operating temperature
NPort® W2150 Plus-JP: 1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Japan band, Japan plug, 0 to 55°C operating temperature
NPort® W2250 Plus-US: 2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, US band, US plug, 0 to 55°C operating temperature
NPort® W2250 Plus-EU: 2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, Euro plug, 0 to 55°C operating temperature
NPort® W2250 Plus-CN: 2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, US plug, CCC
NPort® W2250 Plus-UK: 2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, UK plug, 0 to 55°C operating temperature
NPort® W2250 Plus-SAA: 2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, Australian plug, 0 to 55°C operating temperature
NPort® W2250 Plus-JP: 2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Japan band, Japan plug, 0 to 55°C operating temperature
NPort® W2150 Plus-T: 1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN (includes US, Euro, Japan band), -40 to 75°C operating temperature
NPort® W2250 Plus-T: 2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN (includes US, Euro, Japan band), -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

Serial Cables and Adaptors: See page A-6 for details

DK-35A: 35 mm DIN-Rail Mounting Kit

Package Checklist

- NPort® W2150 Plus or NPort® W2250 Plus wireless device server
- Power adaptor
- Antenna
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Introduction to Industrial Cellular

The latest development in industrial device networking is the adoption of wireless technology for industrial applications. This is a very exciting development with potentially enormous benefits for system integrators and end users. However, many users may have questions about the different technologies that are available and how best to adapt them to specific applications. Moxa provides a complete line of cellular solutions, including cellular modems, IP modems, IP gateways, and even cellular routers.

The following table gives a good overview of the different types of cellular products:

	Cellular Modem	Cellular IP Modem	Cellular IP Gateway	Cellular Router
How to Connect	AT command	TCP/IP	TCP/IP	TCP/IP
Serial Device Connection	Requires dial-up capability	Does not require dial-up capability	Does not require dial-up capability	Not supported
Ethernet Device Connection	Not supported	Not supported	Supported	Supported
Expertise Level	Good knowledge of AT command protocols	Easy to use	Easy to use	Easy to use
Serial Operation Modes	Dial in/out	Real COM, Reverse Real COM, TCP Client, TCP Server, UDP	Real COM, Reverse Real COM, TCP Client, TCP Server, UDP	Not supported
Ethernet Protocols	Not supported	Not supported	NAT, Port-forwarding	NAT, Port-forwarding, Routing
Modem on both Ends?	Required (except GPRS)	Not required	Not required	Not required
Local Memory?	No	Yes	Yes	Yes

Cellular Modems

In industrial networking applications, cellular modems are used to enable communication with serial devices over a cellular network. Cellular modems only run AT commands and lack dial-up capability. Since most serial devices used in industrial applications today also lack dial-up capability, cellular modems must use an intermediary device with dial-up capability, such as an IPC, embedded computer, PLC, etc., in order to connect serial devices to a cellular network. If you are using a serial device that has dial-up capability, then you do not need an intermediary device and can connect it to the cellular modem directly. In addition, you must also possess strong knowledge of AT commands in order to program a cellular modem and construct the network architecture. This requirement also contributes to the higher integration costs associated with using cellular modems compared to IP modems.

Cellular IP Modems and Cellular IP Gateways

A cellular IP modem allows you to connect serial devices over a cellular network. However, Cellular IP gateways is also known as cellular IP modem, the main different between cellular IP modem and IP gateway is supported both serial and Ethernet-based Device to Cellular. Both IP modems are equipped with dial-up capability, which means you no longer need to worry about installing an IPC or limiting yourself to serial devices that have dial-up capability. Instead, you can connect your serial devices directly to the cellular IP modem. This not only eliminates the additional cost associated with deploying an IPC, but it also saves room if your application is bound by tight space constraints. In addition, a cellular IP modem is an “intelligent” device with a built-in memory and a ready-to-use TCP/IP operation mode, which allows it to connect over the Internet and be accessed via a simple web browser. This feature makes cellular IP modems easier to use than cellular modems since no knowledge of AT command protocol is required.

Cellular Routers

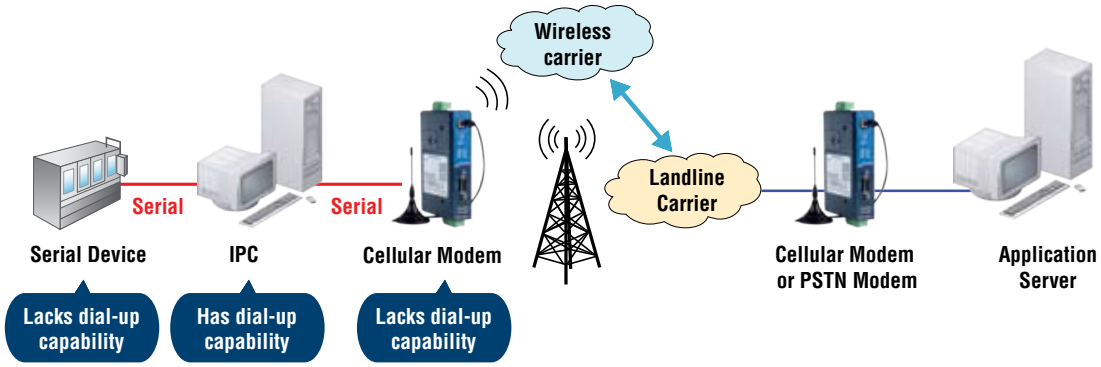
A cellular router is used to connect remote LANs and remote Ethernet devices to the cellular network. Cellular routers come with a complete routing and network protocols that allow you to connected Ethernet devices to the cellular network. Cellular routers are typically deployed as the primary WAN link in areas or applications where using wired connections is costly or not feasible. In areas that can be wired, cellular routers can also be installed as a backup communication link in case the primary cabled link fails. Since these cellular routers are typically deployed at remote gateways, some advanced models also provide built-in network security features, such as firewalls, that are integrated into gateway devices.

Cellular Modems vs. Cellular IP Modems

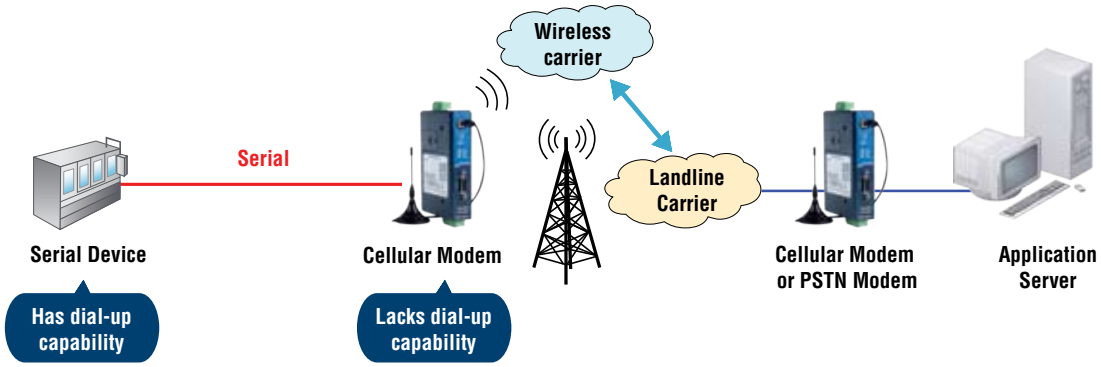
Cellular modems and cellular IP modems are vital components in industrial cellular machine-to-machine (M2M) networking. However, it may be difficult to differentiate between these two devices based on their names alone. The following pictures illustrate the differences between a cellular modem and a cellular IP modem to help you decide which device is most appropriate for your application.Cellular modems and cellular IP modems are vital components in industrial cellular machine-to-machine (M2M) networking. However, it may be difficult to differentiate between these two devices based on their names alone. The following pictures illustrate the differences between a cellular modem and a cellular IP modem to help you decide which device is most appropriate for your application.

Cellular Modem

An Intermediary device with dail-up capability is required to connect a serial device that LACKS dial-up capability

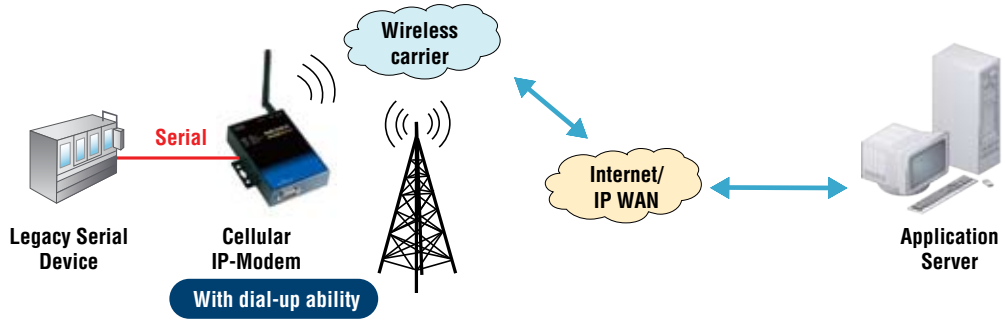


No Intermediary device is required to connect a serial device that HAS dail-up capability



Cellular IP Modem

No Intermediary device is required to connect a serial device that HAS dail-up capability



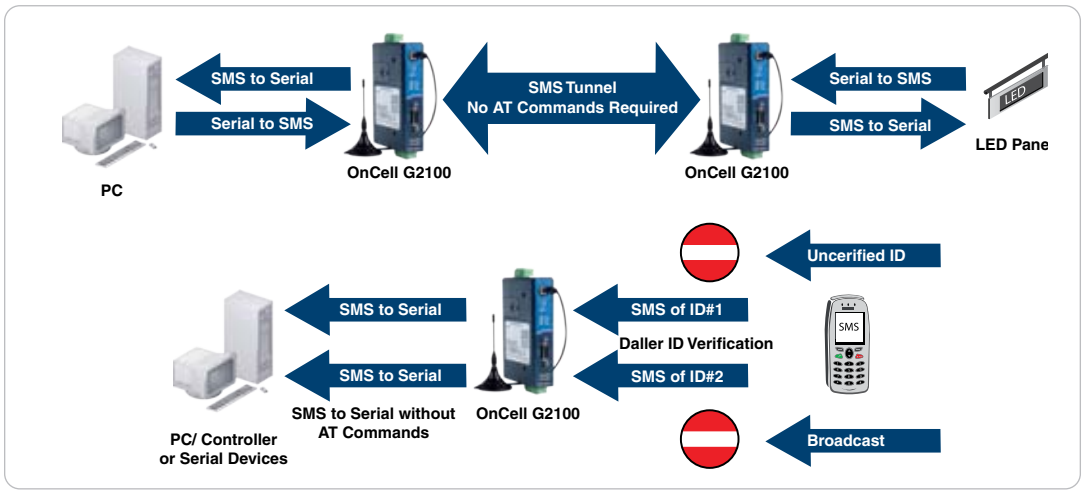
Cellular Modems

AT Commands

The OnCell G2100 supports the standard and extended Hayes* AT command set, in which AT is short for “attention code.” These commands form an industry standard language used to communicate with the modem. The modem can switch between one of two modes. When in “data mode,” the modem treats everything it receives from the intelligent device as data, and then sends it across the cellular network. When in “command mode,” data is interpreted as commands to the local modem.

SMS Tunnel Mode

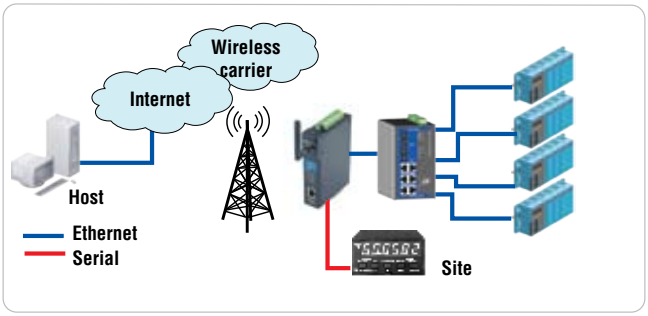
A major benefit of GSM technology is its support of short messages (SMS) for easy communication over the mobile network. With Moxa’s SMS Tunnel Mode, the OnCell G2100 modems allow users to expand applications at little or no extra cost. For example, SMS Tunnel Mode can be used to update the message on a highway display panel, place refill orders for vending machines, handle maintenance for remote rental equipment, or even help create an SMS alarm by directly transforming the text, binary, or unicode data from a legacy device to short message format, without using AT Commands. SMS Tunnel Mode is particularly suitable for devices that communicate infrequently or do not have access to the local network. Although SMS Tunnel Mode converts both ASCII and binary data to short messages transparently, a caller ID (phone number identification) design has been implemented to block messages sent from uncertified users, system broadcasts, and commercial SMS advertisements



Cellular IP Gateways

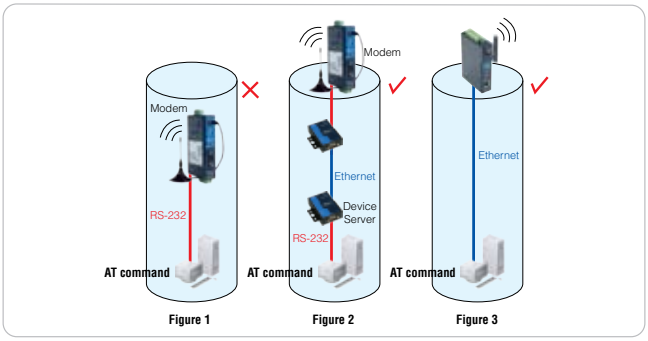
Ethernet-based Device to Cellular

The OnCell G3100 is assigned an IP address by your service provider (your “cellular ISP”). Outgoing TCP/IP connections are handled with Network Address Translation (NAT). This allows any number of local Ethernet devices to act as outgoing TCP/IP clients to access remote servers. However, the OnCell G3100 appears as a single IP address to the “public” Internet. This means that incoming connections must be forwarded manually, based on TCP port number, to the local Ethernet devices.



Virtual Modem Mode

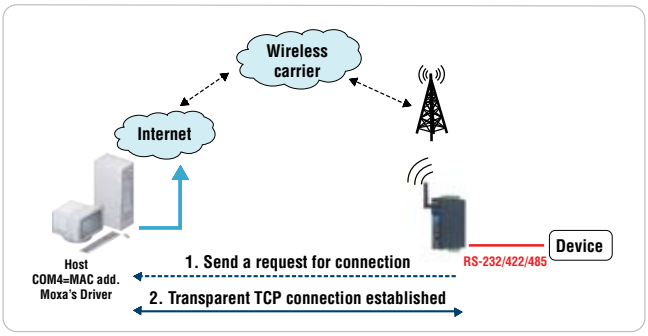
Virtual Modem mode is designed to run with operating systems that support AT commands to extend the distance between devices and modems that communicate through the RS-232 interface (Figure 1). In Figure 2 we show a setup that uses two device servers to extend the transmission distance. If this type of solution is not feasible, or is deemed inefficient, then greater efficiency can be achieved using Moxa’s OnCell IP gateway (Figure 3). By connecting a properly configured OnCell IP gateway’s Ethernet port to the computer’s Ethernet port, and installing the Moxa driver in the computer, it is possible to transmit data over the cellular network, even if the software running on the computer was originally designed to transmit data through a modem.



Cellular IP Modems

Reverse Real COM Mode

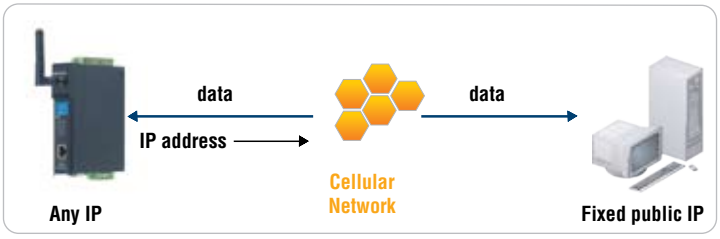
Reverse Real COM mode uses a mechanism similar to port mapping to enable remote devices that are using a private IP address to remain accessible to external hosts. When this mode is enabled, the Moxa driver that comes with the device establishes a transparent connection from the device to the remote host by mapping the device's serial port to a local COM port on the remote host. Reverse Real COM mode supports up to 2 simultaneous connections that enable serial devices to send data to 2 hosts simultaneously.

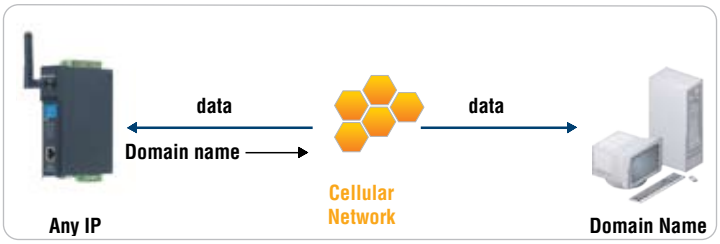


Types of Reverse Real COM Connection

1. Reverse Real COM to PC's IP address
Most cellular service providers only provide customers with a dynamic private IP address, which means that the OnCell G3100 will only obtain an IP address once it is connected to the cellular network. Reverse Real COM is a great feature that allows a PC host to access an OnCell G3100 configured with private IP address.

2. Reverse Real COM to PC's domain name
With Reverse Real COM mode, you can connect to a PC host using the PC's IP address. You can also connect to your PC host with the PC's domain name (provided you have one).





Choice of Connection Type

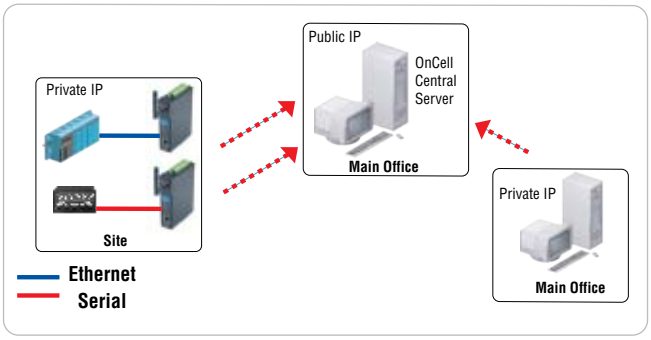
The OnCell G3100 supports three types of connection mode for GSM/GPRS/EDGE communication: (1) Always ON, (2) Inactivity Timeout, and (3) Remote Host Recovered. These connection modes provide users with more connection options for GSM/GPRS/EDGE, and have the potential to reduce the total cost of applications. The GPRS "Always ON" mode maintains connectivity between the OnCell G3100 and the remote device. That is, it enables a fail-safe mechanism that re-establishes the connection when the remote device is down.

Moreover, if the "Inactivity Timeout" mode is enabled, the connection will disconnect if data has not been transmitted between the serial device and cellular network during a user-specified time period, or the remote Ethernet host crashes. The OnCell 3100 will keep pinging the remote host over the Ethernet every 3 seconds after powering on. After failing to connect 5 times in a row, the data from the serial device will be sent through the GSM connection.

OnCell Central Management Software

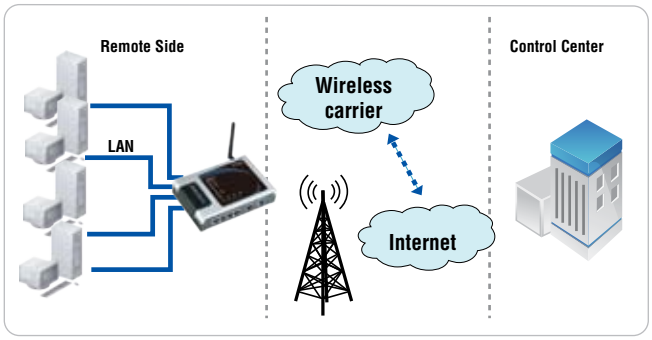
In the cellular world, most service providers only offer private IP addresses to mobile devices due to the limited availability of public addresses. Mobile devices configured with a private IP address can access resources on the Internet, but the mobile devices cannot be managed or accessed directly from the Internet since the private IP address is hidden.

The mechanism we developed uses a server configured with a public IP address to solve this private IP problem. The OnCell Central software installed in the server accepts connections from both Ethernet and serial mobile devices and remote hosts. Once a connection is established, the mobile device and the remote host can communicate with each other over the pre-established connection.



Cellular Routers

Moxa's cellular routers create a secure WAN connection via an Ethernet-to-cellular interface for remote mission-critical data operations. The routers provide secure cellular GSM/GPRS or UMTS/HSDPA connections for reliable primary and backup network connectivity to industrial automation devices, such as SCADA devices, programmable logic controllers (PLCs), and remote terminal units (RTUs). The OnCell 5004 features industrial hardware components that include a terminal block for power, a screw-on type power connector, and a wall-mount accessory. The OnCell 5004 also offers local intelligence with features such as network routing, persistent connections, firewall, and secure integrated remote management software package. Advanced features include TCP/UDP, DHCP support, NAT, port forwarding, and access control lists.



Coming Soon

OnCell 5004/5104-HSDPA

Industrial tri-band UMTS/HSDPA high speed cellular routers

OnCell 5004-HSDPA

OnCell 5104-HSDPA

- Universal tri-band UMTS/HSDPA 850/1900/2100 MHz
- Industrial primary and backup wireless WAN connectivity
- Connect up to 4 10/100BaseT(X) devices
- Redundant DC power inputs
- 2 digital inputs and 1 relay output (OnCell 5104-HSDPA only)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The OnCell 5004/5104-HSDPA are high-performance industrial grade cellular routers that allow up to 4 Ethernet-based devices to simultaneously use a single cellular data account for primary or backup network connectivity to remote sites and devices. Both products provide the functionality of a cellular router, firewall, and switch in one device, and are the industry's first standalone platforms of this type. The difference between the OnCell 5004-HSDPA and OnCell 5104-HSDPA is that the OnCell 5104-HSDPA comes with a built-in relay output that can be configured to indicate the priority of events when notifying or warning engineers in the field, and the two digital inputs allow you to connect basic I/O devices, such as sensors, to the cellular network. The OnCell 5004-HSDPA can be placed on a desktop or wall-mounted, whereas the OnCell 5104-HSDPA has an IA design and can be attached to a DIN-rail. Both products use 12 to 48 VDC power inputs with a screw-on design for greater reliability, and the Ethernet ports come with 1.5 KV magnetic isolation protection to keep your system safe from unexpected electrical discharges.

Specifications

Cellular Interface

Standards: UMTS/HSDPA

Band Options:
Tri-band UMTS/HSDPA 850/1900/2100 MHz
Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz

EDGE Multi-slot Class: Class 10

EDGE Terminal Device Class: Class B

GPRS Multi-slot Class: Class 10

GPRS Terminal Device Class: Class B

GPRS Coding Schemes: CS1 to CS4

Tx Power:
GSM900: 2 W
UMTS/HSDPA: 0.25 W
EDGE900: 0.5 W
EDGE1800: 0.4 W
GSM1800: 1 W

WAN Interface

Number of Ports: 1

Ethernet: 10/100 Mbps, RJ45 connector, Auto MDI/MDIX

Magnetic Isolation Protection: 1.5 KV built-in

LAN Interface

Number of Ports: 4

Ethernet: 10/100 Mbps, RJ45 connector, auto MDI/MDIX

Magnetic Isolation Protection: 1.5 KV built-in

SIM Interface

Number of SIMs: 2

SIM Control: 3 V

I/O Interface (OnCell 5104-HSDPA only)

Alarm Contact: 1 relay output with current carrying capacity of 1A @ 24 VDC

Digital Inputs: 2 electrically isolated inputs
- +13 to +30 V for state "1" (On)
- +3 to -30 V for state "0" (Off)

Software

Network Protocols: UDP/TCP, SNTP, ICMP, DDNS, DHCP/BOOTP, PPPoE, PPP, DNS Relay, HTTPS, Telnet

Router/Firewall: NAT, port forwarding, routing

Authentication: Local user-name and password

Security: IP filtering

Physical Characteristics

Housing: Aluminum, providing IP30 protection

Weight:
OnCell 5004-HSDPA: 505±5 g
OnCell 5104-HSDPA: 645±5 g

Dimensions:
OnCell 5004-HSDPA: 158 x 103 x 34 mm (6.22 x 4.06 x 1.34 in)
OnCell 5104-HSDPA: 160 x 103 x 50 mm (6.30 x 4.06 x 1.97 in)

Environmental Limits

Operating Temperature: -30 to 55°C (-22 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 75°C (-40 to 167°F)

Power Requirements

Number of Power Inputs: 1 terminal block, 1 power jack

Input Voltage: 12 to 48 VDC

Data Link: 335 to 1185 mA (peak) @ 12 V

Regulatory Approvals

Safety:
UL: UL60950

RF:
FCC Part22H
FCC PART24E
EN301 489-1
EN301 489-7
EN301 511

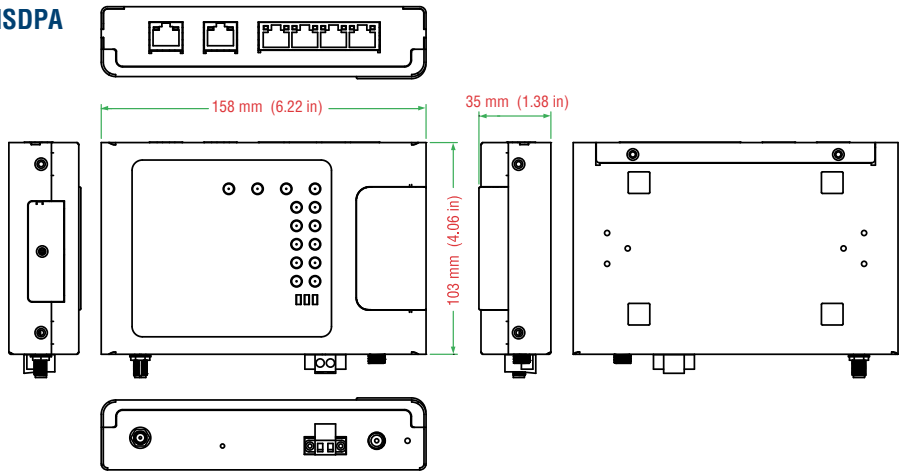
EMC:
CE: EN55022 Class A / EN55024
FCC: FCC part 15 subpart B, Class A
EN61000-4-2 (ESD) Level 4
EN61000-4-3 (RS) Level 3
EN61000-4-4 (EFT) Level 4
EN61000-4-5 (Surge) Level 3
EN61000-4-8 Level 3
EN61000-4-12 Level 3

Warranty

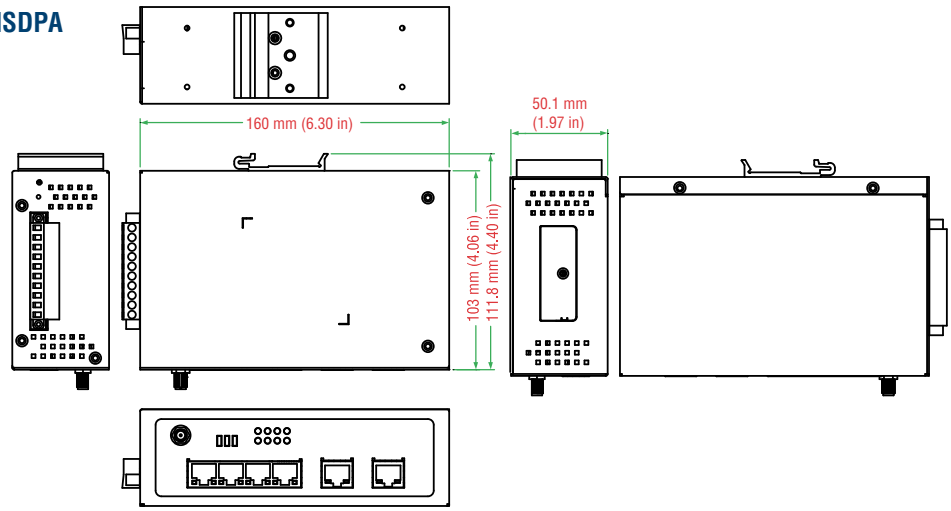
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

OnCell 5004-HSDPA



OnCell 5104-HSDPA



Ordering Information

Available Models

OnCell 5004-HSDPA: 4-port 10/100M Ethernet to UMTS/HSDPA cellular router
OnCell 5104-HSDPA: 4-port 10/100M Ethernet to UMTS/HSDPA cellular router, IA design

Optional Accessories (can be purchased separately)

DC Power Supply (screw-on): See Appendix A
DC Power Supply (standard): See Appendix A
Power Jack to Terminal Block Cable: See Appendix A
ANT-WCDMA-ASM-1.5: Omni 1.5dBi/10cm, magnetic SMA tri-band antenna (impedance = 50 ohms)
ANT-WCDMA-AHSM-04-2.5m: Omni 4dBi/11cm, magnetic SMA tri-band antenna, 2.5 m (impedance = 50 ohms)

Package Checklist

- OnCell Cellular Router
- Rubber SMA antenna
- Rubber stand (OnCell 5004-HSDPA only)
- Wall-mount Kit (OnCell 5004-HSDPA only)
- Din-Rail Kit (OnCell 5104-HSDPA only)
- Terminal block (screw type)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

OnCell 5004/5104

Industrial quad-band GSM/GPRS cellular routers

OnCell 5004

OnCell 5104

- Universal quad-band GSM/GPRS 850/900/1800/1900 MHz
- Industrial primary and backup wireless WAN connectivity
- Connect up to 4 10/100BaseT(X) devices
- Centralized private IP management software
- Redundant DC power inputs
- 2 digital inputs and 1 relay output (OnCell 5104 only)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The OnCell 5004/5104 are high-performance industrial grade cellular routers that allow up to 4 Ethernet-based devices to simultaneously use a single cellular data account for primary or backup network connectivity to remote sites and devices. Both products provide the functionality of a cellular router, firewall, and switch in one device, and are the industry's first standalone platform of this type. The difference between the OnCell 5004 and OnCell 5104 is that the OnCell 5104 comes with a built-in relay output that can be configured to indicate the priority of events when notifying or warning engineers in the field, and the two digital inputs allow you to connect basic I/O devices, such as sensors, to the cellular network. The OnCell 5004 can be placed on a desktop or wall-mounted, whereas the OnCell 5104 has an IA design and can be attached to a DIN-rail. Both products use 12 to 48 VDC power inputs with a screw-on design for greater reliability, and the Ethernet ports come with 1.5 KV magnetic isolation protection to keep your system safe from unexpected electrical discharges.

Specifications

Cellular Interface

Standards: GSM/GPRS

Band Options: Quad-band 850/900 and 1800/1900 MHz

GPRS Multi-slot Class: Class 10

GPRS Terminal Device Class: Class B

GPRS Coding Schemes: CS1 to CS4

Tx Power: 1 watt GSM 1800/1900, 2 watts EGSM 850/900

WAN Interface

Number of Ports: 1

Ethernet: 10/100 Mbps, RJ45 connector, Auto MDI/MDIX

Magnetic Isolation Protection: 1.5 KV built-in

LAN Interface

Number of Ports: 4

Ethernet: 10/100 Mbps, RJ45 connector, auto MDI/MDIX

Magnetic Isolation Protection: 1.5 KV built-in

SIM Interface

Number of SIMs: 2

SIM Control: 3 V

I/O Interface (OnCell 5104 only)

Alarm Contact: 1 relay output with current carrying capacity of 1A @ 24 VDC

Digital Inputs: 2 electrically isolated inputs
- +13 to +30 V for state "1" (On)
- +3 to -30 V for state "0" (Off)

Software

Network Protocols: UDP/TCP, SNTP, ICMP, DDNS, DHCP/BOOTP, PPPoE, PPP, DNS Relay, HTTPS, Telnet

Router/Firewall: NAT, port forwarding, routing

Authentication: Local user-name and password

Security: IP filtering

Management Software

OnCell Central Manager: Centralized management solution for accessing private IPs from the Internet

Physical Characteristics

Housing: Aluminum, providing IP30 protection

Weight:
OnCell 5004: 505±5 g
OnCell 5104: 645±5 g

Dimensions:
OnCell 5004: 158 x 103 x 34 mm (6.22 x 4.06 x 1.34 in)
OnCell 5104: 160 x 103 x 50 mm (6.30 x 4.06 x 1.97 in)

Environmental Limits

Operating Temperature: -30 to 55°C (-22 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 75°C (-40 to 167°F)

Power Requirements

Number of Power Inputs: 1 terminal block, 1 power jack

Input Voltage: 12 to 48 VDC

Data Link: 335 to 900 mA (peak) @ 12 V

Regulatory Approvals

Safety:
UL: UL60950

RF:
FCC Part22H
FCC PART24E
EN301 489-1
EN301 489-7
EN301 511

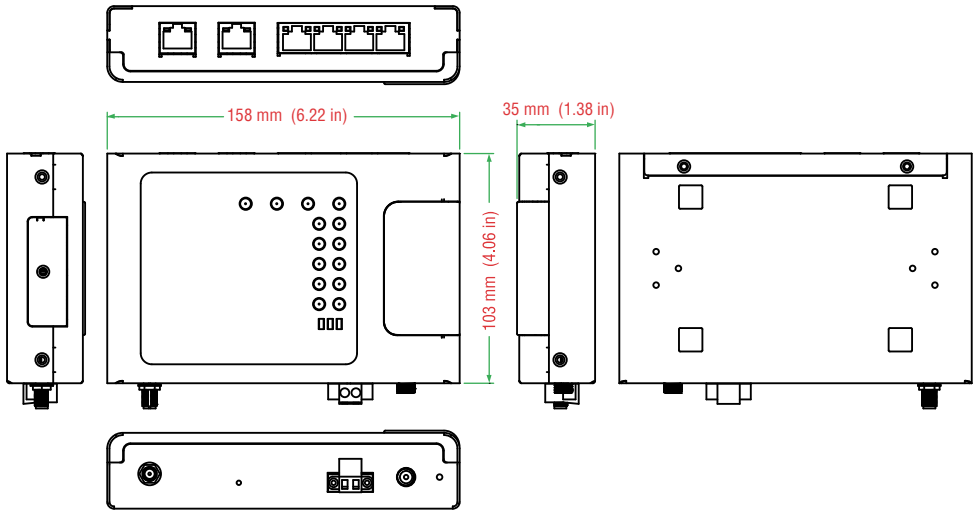
EMC:
CE: EN55022 Class A / EN55024
FCC: FCC part 15 subpart B, Class A
EN61000-4-2 (ESD) Level 4
EN61000-4-3 (RS) Level 3
EN61000-4-4 (EFT) Level 4
EN61000-4-5 (Surge) Level 3
EN61000-4-8 Level 3
EN61000-4-12 Level 3

Warranty

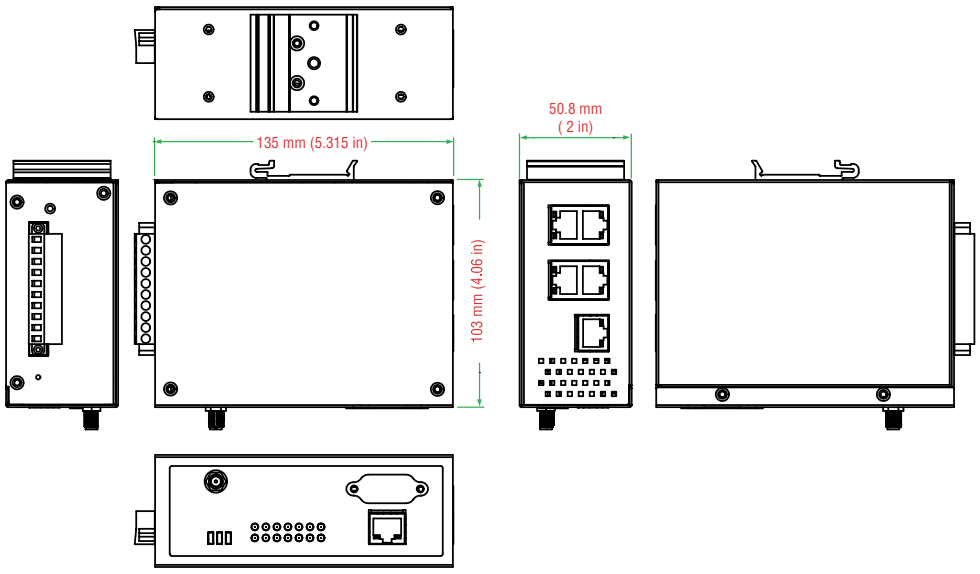
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

OnCell 5004



OnCell 5104



Ordering Information

Available Models

OnCell 5004: 4-port 10/100M Ethernet to GSM/GPRS cellular router
OnCell 5104: 4-port 10/100M Ethernet to GSM/GPRS cellular router, IA design

Optional Accessories (can be purchased separately)

DC Power Supply (screw-on): See Appendix A
DC Power Supply (standard): See Appendix A
Power Jack to Terminal Block Cable: See Appendix A
ANT-CQB-AHSM-00-3m: Omni 0dBi/10cm, magnetic SMA quad-band antenna (impedance = 50 ohms), 3 m
ANT-CQB-AHSM-03-3m: Omni 3dBi/25cm, magnetic SMA quad-band antenna (impedance = 50 ohms), 3 m
ANT-CQB-AHSM-05-3m: Omni 5dBi/37cm, magnetic SMA quad-band antenna (impedance = 50 ohms), 3 m

Package Checklist

- OnCell Cellular Router
- Rubber SMA antenna
- Rubber stand (OnCell 5004 only)
- Wall-mount Kit (OnCell 5004 only)
- Din-Rail Kit (OnCell 5104 only)
- Terminal block (screw type)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

OnCell G3110/3150-HSDPA

Industrial tri-band UMTS/HSDPA IP gateways

OnCell G3110-HSDPA

OnCell G3150-HSDPA

- Universal tri-band UMTS/HSDPA 850/1900/2100 MHz
- Bring 10/100Base-T and serial devices together
- Choice of operation modes, including TCP Server, TCP Client, UDP, Real COM, Reverse Real COM, and RFC2217
- Secure modes for TCP Server, TCP Client, Real COM, and Reverse Real COM
- Redundant DC power inputs
- Two digital inputs and 1 relay output
- DIN-Rail

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The OnCell G3100-HSDPA series of high-speed industrial-grade IP gateways are intelligent and fully-featured wireless communication platforms that connect your legacy serial devices over a cellular TCP/IP network. The OnCell G3100-HSDPA series offers connectivity to all tri HSDPA/UMTS frequency bands, as well as all quad GSM/GPRS/EDGE frequency bands (850/900/1800/1900 MHz), used in Europe and the United States, allowing seamless global roaming on the best available network. The OnCell G3100-HSDPA offers versatile operation modes such as Reverse Real COM mode for cellular network structures (to handle the IP address issue), which automatically generates a virtual COM port to match serial ports, allowing you to communicate with remote serial devices. The OnCell G3100-HSDPA also comes with a built-in relay output that can be configured to indicate the priority of events when notifying or warning engineers in the field. Two digital inputs also allow you to connect basic I/O devices, and the OnCell G3100-HSDPA comes with redundant power inputs to assure non-stop operation.

Specifications

Cellular Interface

Standards: UMTS/HSDPA

Band Options:
• Tri-band UMTS/HSDPA 850/1900/2100 MHz
• Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz

EDGE Multi-slot Class: Class 10

EDGE Terminal Device Class: Class B

GPRS Multi-slot Class: Class 10

GPRS Terminal Device Class: Class B

GPRS Coding Schemes: CS1 to CS4

Tx Power:
GSM900: 2 W
UMTS/HSDPA: 0.25 W
EDGE900: 0.5 W
EDGE1800: 0.4 W
GSM1800: 1 W

LAN Interface

Number of Ports: 1

Ethernet: 10/100 Mbps, RJ45 connector, Auto MDI/MDIX

Magnetic Isolation Protection: 1.5 KV built-in

SIM Interface

Number of SIMs: 1

SIM Control: 3 V

Serial Interface

Number of Ports: 1

Serial Standards:
G3110: RS-232 (DB9 male connector)
G3150: RS-232 (DB9 male connector), RS-422/485 (5-pin terminal block connector)

ESD Protection: 15 KV

Power EFT/Surge Protection: 2 KV

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2 (when parity = None)

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF

Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

RS-485-2w: Data+, Data-, GND

I/O Interface

Alarm Contact: 1 relay output with current carrying capacity of 1A @ 24 VDC

Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state "1" (On)
• +3 to -30 V for state "0" (Off)

Software

Network Protocols: ICMP, TCP/IP, UDP, DHCP, Telnet, DNS, SNMP, HTTP, SMTP, HTTPS, SNTP, ARP, SSL

Router/Firewall: NAT, port forwarding

Authentication: Local user-name and password

Security: Accessible IP list

Operation Modes: Real COM, Secure Real COM, TCP Server, Secure TCP Server, TCP Client, Secure TCP Client, UDP, RFC2217, Ethernet Modem, Virtual Modem, SMS Tunnel

Configuration and Management Options: SNMP MIB-II, SNMP Private MIB, SNMPv1/v2c/v3, DDNS, IP Report, Web/Telnet/Serial-Console/SSH

Utilities: Provided for Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server-2008, Windows XP/2003/Vista/Server-2008 x64 Edition

Windows Real COM Drivers: Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server 2008, Windows XP/2003/Vista/Server 2008 x64 Edition

Fixed TTY Drivers: SCO Unix, SCO OpenServer 5, SCO OpenServer 6, UnixWare 7, SVR4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD 5, FreeBSD 6

Linux Real TTY Drivers: Linux kernels 2.2.x, 2.4.x, 2.6.x

Physical Characteristics

Housing: Aluminum, providing IP30 protection

Weight: 440±5 g

Dimensions: 28 x 126 x 93 mm (1.10 x 4.96 x 3.66 in)

Environmental Limits

Operating Temperature: -30 to 55°C (-22 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 75°C (-40 to 167°F)

Power Requirements

Number of Power Inputs: 2 (terminal block)

Input Voltage: 12 to 48 VDC

Data Link: 335 to 1185 mA (peak) @ 12 V

Regulatory Approvals

Safety:
UL: UL60950

RF:
FCC Part22H
FCC PART24E
EN301 489-1
EN301 489-7
EN301 511

EMC:
CE: EN55022 Class A / EN55024
FCC: FCC part 15 subpart B, Class A
EN61000-4-2 (ESD) Level 4
EN61000-4-3 (RS) Level 3
EN61000-4-4 (EFT) Level 4
EN61000-4-5 (Surge) Level 3
EN61000-4-8 Level 3
EN61000-4-12 Level 3

Reliability

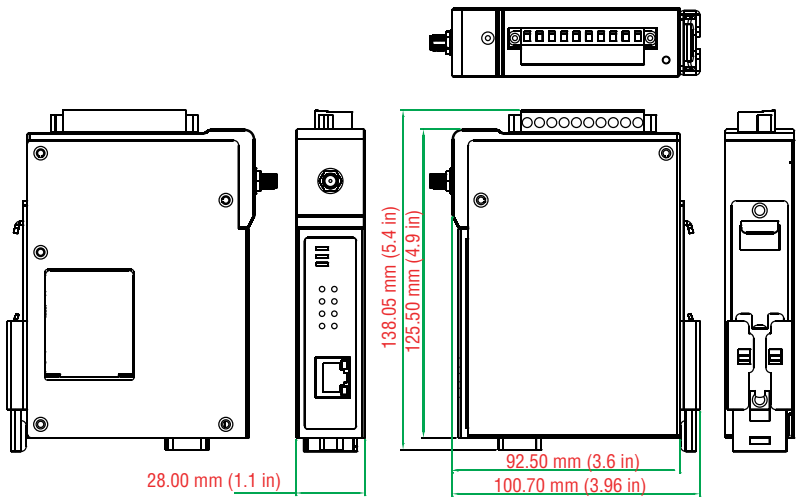
MTBF (meantime between failures): 380,459 hours (G3110-HSDPA/G3150-HSDPA)

Warranty

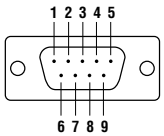
Warranty Period: 5 years

Details: See www.moxa.com/warranty

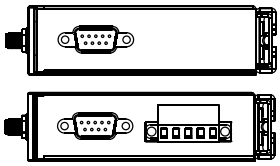
Dimensions & Pin Assignment



DB9 male connector



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–
9	–	–	–



OnCell G3110-HSDPA

OnCell G3150-HSDPA

Ordering Information

Available Models

OnCell G3110-HSDPA: 1-port RS-232 to UMTS/HSDPA IP gateway

OnCell G3150-HSDPA: 1-port RS-232/422/485 to UMTS/HSDPA IP gateway

Optional Accessories (can be purchased separately)

DC Power Supply: See Appendix A

Power Jack to Terminal Block Cable: See Appendix A

ANT-WCDMA-ASM-1.5: Omni 1.5dBi/10cm, magnetic SMA tri-band antenna (impedance = 50 ohms)

ANT-WCDMA-AHSM-04-2.5m: Omni 4dBi/11cm, magnetic SMA tri-band antenna, 2.5 m (impedance = 50 ohms)

Package Checklist

- OnCell IP Gateway
- Rubber SMA antenna
- DIN-Rail Kit
- 5-pin Terminal Block (screw type)
- 10-pin Terminal Block (screw type)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

OnCell G3110/3150

Industrial quad-band GSM/GPRS/EDGE IP gateways

- Connect both Ethernet and serial devices to cellular networks
- Universal quad-band GSM/GPRS/EDGE-850/900/1800/1900-MHz
- Choice of operation modes, including TCP Server, TCP Client, UDP, Real COM, and RFC2217
- Secure modes for TCP Server, TCP Client, and Real COM
- Redundant DC power input
- 2 digital inputs and 1 relay output
- Centralize private IP management software
- DIN-Rail mounting

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The OnCell G3110 and G3150 industrial RS-232 and RS-232/422/485 GSM/GPRS/EDGE IP gateway are designed to transmit data transparently over GSM/GPRS/EDGE cellular networks. The Real COM operation mode automatically generates a virtual COM port to match serial ports supported by the OnCell G3110/3150, allowing you to communicate with remote serial devices. The OnCell G3100 can transmit data from both serial devices and Ethernet devices to a WAN interface. To achieve this Ethernet-to-cellular function, the OnCell G3100 works in a manner similar to a router. All Ethernet devices connected to the OnCell's LAN port will be hidden from the outside world with OnCell's NAT function.

Specifications

Cellular Interface

Standards: GSM/GPRS/EDGE
Band Options: Quad-band 850/900 and 1800/1900 MHz
EDGE Multi-slot Class: Class 12
GPRS Multi-slot Class: Class 12
GPRS Terminal Device Class: Class B
GPRS Coding Schemes: CS1 to CS4
Tx Power: 1 watt GSM 1800/1900, 2 watts EGSM 850/900

LAN Interface

Number of Ports: 1
Ethernet: 10/100 Mbps, RJ45 connector, Auto MDI/MDIX
Magnetic Isolation Protection: 1.5 KV built-in

SIM Interface

Number of SIMs: 1
SIM Control: 3 V

Serial Interface

Number of Ports: 1
Serial Standards:
G3110: RS-232 (DB9 male connector)
G3150: RS-232 (DB9 male connector), RS-422/485 (5-pin terminal block connector)
ESD Protection: 15 KV
Power EFT/Surge Protection: 2 KV

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2 (when parity = None)
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

I/O Interface

Alarm Contact: 1 relay output with current carrying capacity of 1A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state "1" (On)
• +3 to -30 V for state "0" (Off)

Software

Network Protocols: ICMP, TCP/IP, UDP, DHCP, Telnet, DNS, SNMP, HTTP, SMTP, HTTPS, SNTP, ARP, SSL
Router/Firewall: NAT, port forwarding
Authentication: Local user-name and password
Security: Accessible IP list
Operation Modes: Real COM, Secure Real COM, TCP Server, Secure TCP Server, TCP Client, Secure TCP Client, UDP, RFC2217, Ethernet Modem, Virtual Modem, SMS Tunnel
Configuration and Management Options: SNMP MIB-II, SNMP Private MIB, SNMPv1/v2c/v3, DDNS, IP Report, Web/Telnet/Serial-Console/SSH
Utilities: Provided for Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server-2008, Windows XP/2003/Vista/Server-2008 x64 Edition
Windows Real COM Drivers: Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server 2008, Windows XP/2003/Vista/Server 2008 x64 Edition

Fixed TTY Drivers: SCO Unix, SCO OpenServer 5, SCO OpenServer 6, UnixWare 7, SVR4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD 5, FreeBSD 6

Linux Real TTY Drivers: Linux kernels 2.2.x, 2.4.x, 2.6.x

Management Software

OnCell Central Manager: Centralized management solution for accessing private IPs from the Internet

Physical Characteristics

Housing: Aluminum, providing IP30 protection

Weight: 440±5 g

Dimensions: 28 x 126 x 93 mm (1.10 x 4.96 x 3.66 in)

Environmental Limits

Operating Temperature: -30 to 55°C (-22 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 75°C (-40 to 167°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Data Link: 335 to 1185 mA (peak) @ 12 V

Regulatory Approvals

Safety:
UL: UL60950

RF:
FCC Part22H
FCC PART24E
EN301 489-1
EN301 489-7
EN301 511
PTCRB

EMC:
CE: EN55022 Class A / EN55024
FCC: FCC part 15 subpart B, Class A
EN61000-4-2 (ESD) Level 4
EN61000-4-3 (RS) Level 3
EN61000-4-4 (EFT) Level 4
EN61000-4-5 (Surge) Level 3
EN61000-4-8 Level 3
EN61000-4-12 Level 3

Reliability

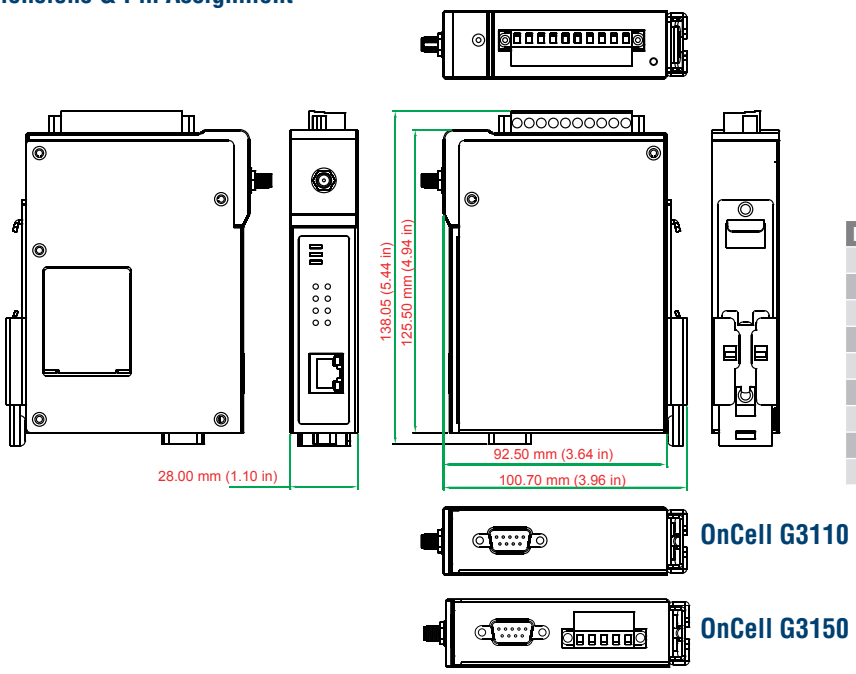
MTBF (meantime between failures): G3110/G3150: 339045 hours

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

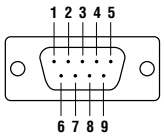
Dimensions & Pin Assignment



OnCell G3110

OnCell G3150

DB9 male connector



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–
9	–	–	–

Ordering Information

Available Models

OnCell G3110: 1-port RS-232 to GSM/GPRS/EDGE IP gateway

OnCell G3150: 1-port RS-232/422/485 to GSM/GPRS/EDGE IP gateway

Optional Accessories (can be purchased separately)

DC Power Supply: See Appendix A

Power Jack to Terminal Block Cable: See Appendix A

Quad-band Antennas (impedance = 50 ohms)

ANT-CQB-AHSM-00-3m: Omni 0dBi/10cm, magnetic SMA antenna, 3 m

ANT-CQB-AHSM-03-3m: Omni 3dBi/25cm, magnetic SMA antenna, 3 m

ANT-CQB-AHSM-05-3m: Omni 5dBi/37cm, magnetic SMA antenna, 3 m

Package Checklist

- OnCell IP gateway
- Rubber SMA antenna
- DIN-Rail kit
- 5-pin terminal block (screw type)
- 10-pin terminal block (screw type)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

OnCell G3111/3151/3211/3251

1 and 2-port RS-232 or RS-232/422/485 cellular IP modems

- Universal quad-band GSM/GPRS 850/900/1800/1900 MHz
- Choice of operation modes, including TCP Server, TCP Client, UDP, Real COM, and Reverse Real COM
- Management Software: Private IP management with OnCell Central
- Choice of configuration methods, including web console, serial console, and Telnet
- Desktop or DIN-Rail installation

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The OnCell G3111/G3151/G3211/G3251 are cost effective cellular IP modems that can conveniently and transparently connect up to two devices to a cellular network, allowing you to network your existing serial devices with only basic configuration. OnCell provides versatile operation modes that make data transmission between the serial and cellular interfaces bi-directional. The G3111/G3151/G3211/G3251 cellular IP modems are compact, and can be used on a desktop or mounted on a DIN-rail. The products come with a 12 to 48 VDC power input and have 2 KV EFT/Surge protection to allow the use of different types of field power sources. The serial ports are also protected by 15 KV ESD line protection to keep your system safe from unexpected electrical discharges.

Specifications

Cellular Interface

Standards: GSM/GPRS
Band Options: Quad-band 850/900 and 1800/1900 MHz
GPRS Multi-slot Class: Class 10
GPRS Terminal Device Class: Class B
GPRS Coding Schemes: CS1 to CS4
Tx Power: 1 watt GSM 1800/1900, 2 watts EGSM 850/900
SIM Control: 3 V

LAN Interface

Number of Ports: 1
Ethernet: 10/100 Mbps, RJ45 connector, Auto MDI/MDIX
Magnetic Isolation Protection: 1.5 KV built-in

SIM Interface

Number of SIMs: 1
SIM Control: 3 V

Serial Interface

Number of Ports: 1 or 2
Serial Standards:
G3111: 1 RS-232 port
G3151: 1 RS-422/485 port
G3211: 2 RS-232 ports
G3251: 2 RS-422/485 ports
ESD Protection: 15 KV
Power EFT/Surge Protection: 2 KV

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2 (when parity = None)
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, TCP/IP, UDP, DHCP, Telnet, DNS, SNMP, HTTP, HTTPS, SMTP, SNTP, ARP
Authentication: Local user-name and password
Security: Accessible IP list
Operation Modes: Real COM, TCP Server, TCP Client, UDP, SMS Tunnel, Reverse Real COM
Configuration and Management Options: SNMP MIB-II, v3, DDNS, IP Report, Web/Telnet/Serial Console, Serial Logging
Utilities: Provided for Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server-2008, Windows XP/2003/Vista/Server-2008 x64
Windows Real COM Drivers: Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server-2008, Windows XP/2003/Vista/Server-2008 x64

Management Software

OnCell Central Manager: Centralized management solution for accessing private IPs from the Internet

Physical Characteristics

Housing: Aluminum, providing IP30 protection

Weight:
OnCell G3111/G3151: 165±5 g
OnCell G3211/G3251: 185±5 g

Dimensions: 111 x 77 x 26 mm (4.37 x 3.03 x 1.02 in)

Environmental Limits

Operating Temperature: -30 to 55°C (-22 to 131°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -40 to 75°C (-40 to 167°F)

Power Requirements

Number of Power Inputs: 1 power jack

Input Voltage: 12 to 48 VDC

Data Link: 335 to 900 mA (peak) @ 12 V

Regulatory Approvals

RF:
EN301 489-1
EN301 489-7
EN301 511

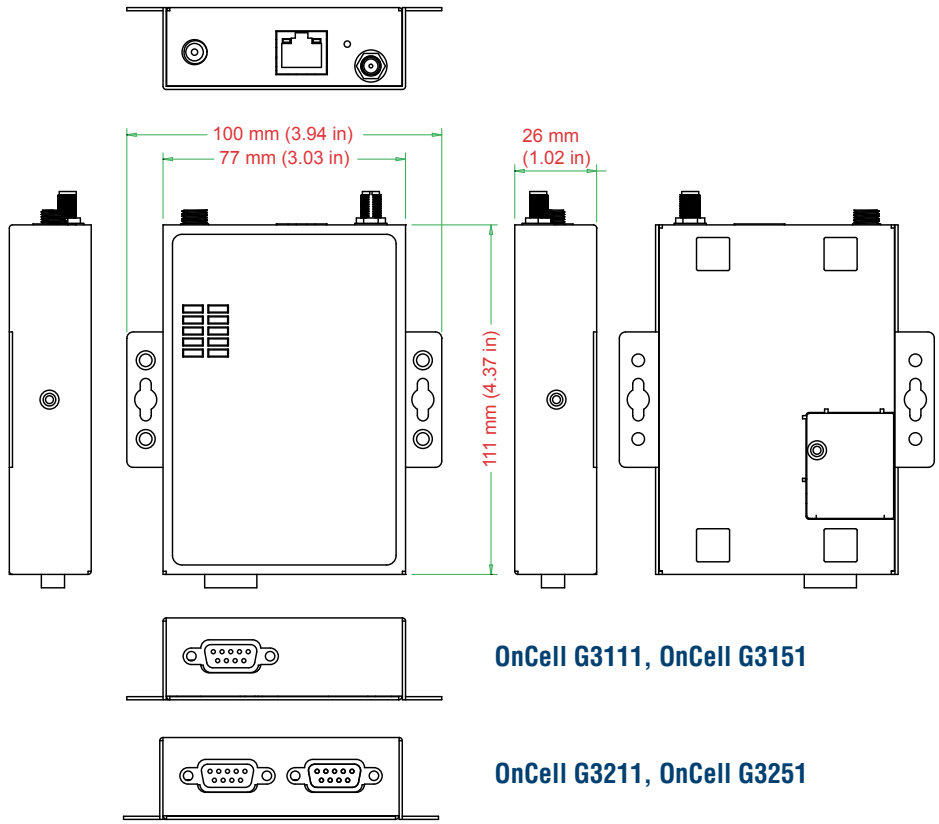
EMC:
CE: EN55022 Class A / EN55024
FCC: FCC part 15 subpart B, Class A
EN61000-4-2 (ESD)
EN61000-4-3 (RS)
EN61000-4-4 (EFT)
EN61000-4-5 (Surge)
EN61000-4-8
EN61000-4-12

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



OnCell G3111, OnCell G3151

OnCell G3211, OnCell G3251

Ordering Information

Available Models

OnCell G3111: 1-port RS-232 to GSM/GPRS IP modem
OnCell G3151: 1-port RS-232/422/485 to GSM/GPRS IP modem
OnCell G3211: 2-port RS-232 to GSM/GPRS IP Modem
OnCell G3251: 2-port RS-232/422/485 to GSM/GPRS IP Modem

Package Checklist

- OnCell IP Modem
- Rubber SMA antenna
- DC Power Supply (screw-on)
- DIN-Rail Kit
- Rubber stand
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Optional Accessories (can be purchased separately)

DC Power Supply (screw-on): See Appendix A
ANT-CQB-AHSM-00-3m: Omni 0dBi/10cm, magnetic SMA quad-band antenna (impedance = 50 ohms), 3 m
ANT-CQB-AHSM-03-3m: Omni 3dBi/25cm, magnetic SMA quad-band antenna (impedance = 50 ohms), 3 m
ANT-CQB-AHSM-05-3m: Omni 5dBi/37cm, magnetic SMA quad-band antenna (impedance = 50 ohms), 3 m

OnCell G2100 Series

Industrial quad-band GSM/GPRS modems

- Quad-band GSM/GPRS 850/900/1800/1900 MHz
- Separate RS-232 and RS-422/485 serial interfaces (G2150I only)
- 2.5 KV RMS isolation for 1 min. for all serial signals (G2150I only)
- Extended operating temperature from -30 to 75°C (G2110-T only)
- Vertical IP30 housing with SIM card protection
- LED indicators for GSM/GPRS, data transmission, and signal level
- DIN-Rail and wall mounting
- SMS Tunnel Mode provided

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The OnCell G2100 Series of industrial quad-band GSM/GPRS modems are designed to transmit data and short messages (SMS) over GSM/GPRS mobile networks. The modems can be used to increase the efficiency of maintenance and communication, but do not require extensive training. In addition, the modems can be mounted on a DIN-rail or wall. The OnCell G2100 modems accept a 12 to 48 VDC power input, making them suitable for use with a variety of field power sources. The serial ports feature 15 KV ESD line protection to protect the products from harmful electrical discharge, and separate RS-232 and RS-422/485 interfaces are built into the OnCell G2150I, each with 2.5 KV RMS isolation protection for one minute. The two serial interfaces on the OnCell G2150I make it ideal for attaching all kinds of devices, such as stand-alone controllers, PC COM ports, and multi-dropped electric meters. In addition, the OnCell G2110-T has an extended operating temperature (-40 to 75°C) design that makes it suitable for heavy industrial use.

Specifications

Cellular Interface

Standards: GSM and GPRS
Band Options: Quad-band 850/900/1800/1900 MHz
GPRS Multi-slot Class: Class 10
GPRS Terminal Device Class: Class B
GPRS Coding Schemes: CS1 to CS4
CSD Data Transmission Rate: Up to 14,400 bps
Tx Power: 1 watt GSM1800/1900, 2 watts EGSM 900/GSM 850

SIM Interface

Number of SIMs: 1
SIM Control: 3 V

Serial Interface

Number of Ports: 1
Serial Standards:
G2110: RS-232 (DB9 female connector)
G2150I: RS-232 (DB9 female connector), RS-422/485 (5-pin terminal block connector)
ESD Protection: 15 KV (G2110 only)
Optical Isolation: 2.5 KV (G2150I only)

Serial Communication Parameters

Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS
Baudrate: 300 bps to 115.2 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, RI, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Physical Characteristics

Housing: ABS + PC, IP30 protected
Weight: 150 ± 5 g
Dimensions: 27 x 123 x 79 mm (1.06 x 4.84 x 3.11 in)

Environmental Limits

Operating Temperature:
G2110/2150I: 0 to 55°C (32 to 131°F)
G2110-T: -30 to 75°C (-22 to 167°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -40 to 75°C (-40 to 167°F)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption:
Idle: 50 mA @ 12 V
Data Link: 300 to 900 mA (peak) @ 12 V

Regulatory Approvals

RF: FCC Part 22H, FCC Part 24E, EN301 489-1, EN301 489-7, EN301 511
EMC: CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A

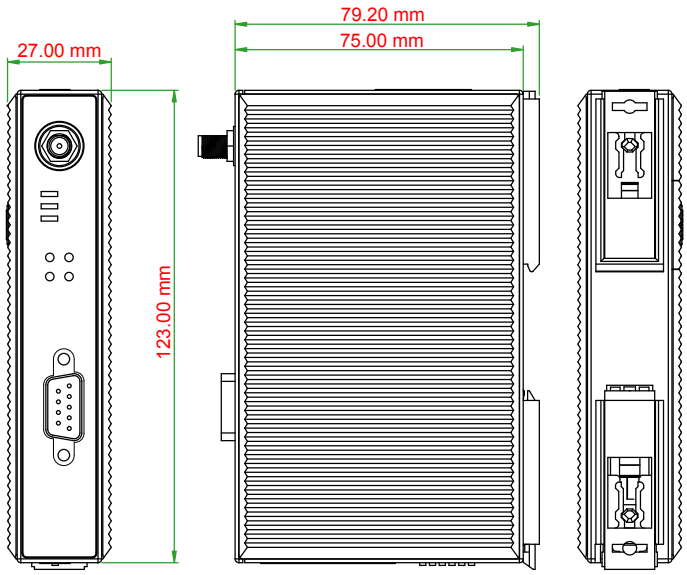
Reliability

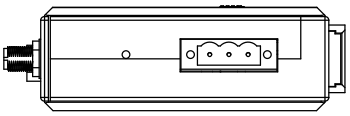
MTBF:
G2110/G2110-T: 925627 hours
G2150I: 864965 hours

Warranty

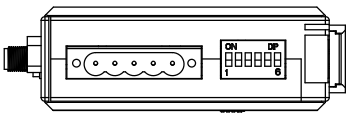
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions



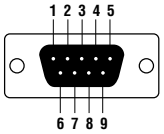


OnCell G2110



OnCell G2150I

DB9 female RS-232 port



PIN	RS-232
1	DCD
2	TxD
3	RxD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS

Ordering Information

Available Models

OnCell G2110: 1-port RS-232 to GSM/GPRS modem
OnCell G2110-T: 1-port RS-232 to GSM/GPRS modem, wide temperature (-30 to 75°C)
OnCell G2150I: 1-port RS-232/422/485 to GSM/GPRS moden, with 2.5 KV optical isolation

Optional Accessories (can be purchased separately)

DC Power Supply: See Appendix A

Quad-band Antennas (impedance = 50 ohms)
ANT-CQB-AHSM-00-3m: Omni 0dBi/10cm, magnetic SMA antenna, 3 m
ANT-CQB-AHSM-03-3m: Omni 3dBi/25cm, magnetic SMA antenna, 3 m
ANT-CQB-AHSM-05-3m: Omni 5dBi/37cm, magnetic SMA antenna, 3 m

Package Checklist

- OnCell cellular modem
- Omni 0 dBi, magnetic SMA, 3 meter antenna
- Power jack to terminal block cable
- 3-pin terminal block (screw type)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Introduction to Wi-Fi Antennas

Why Antennas are Important

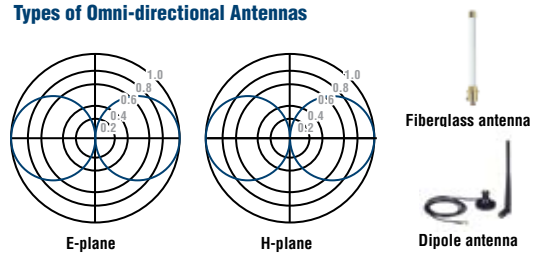
The speed of your wireless connection will vary depending on the strength of the signal you can receive and transmit. Antenna selection can therefore have a significant impact on the speed of your wireless link.

Types of Antennas

There are two basic types of antennas for WLAN and cellular products: Omni-directional and directional. The two types are categorized by the direction in which they beam radio signals.

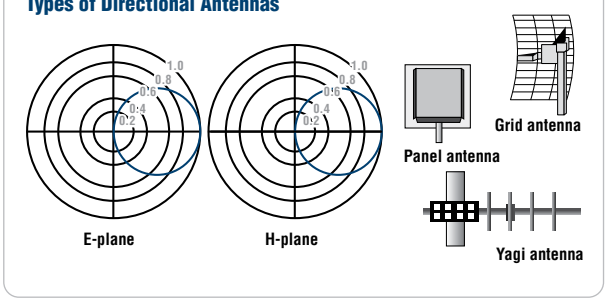
Omni-directional

Omni-directional antennas are designed to radiate signals equally in all directions. Use this type of antenna if you need to transmit from a central node, such as an access point, to users scattered all around the area.



Directional

Directional antennas provide a more focused signal than omni-directional antennas. Signals are typically transmitted in an oval-shaped pattern with a beam width of only a few degrees. With higher gain, directional antennas can also be used outdoors to extend point-to-point links over a longer transmission distance, or to form a point-to-multipoint network.



Antenna Connectors

Before you purchase an antenna for your wireless device, you should check the type of antenna connector that your device uses. You will need to buy an antenna with a matching connector. There are several types of antenna connectors, including MCX, TNC, N-type, SMA, and RP-SMA (RP stands for “reverse polarity” or “reverse ping”). On WLAN devices, the most commonly used antenna connector is PR-SMA and N-type for IEEE 802.11 wireless applications. Make sure you are buying an antenna with the right connector type.

N-type (male) | N-type (female) | RP-SMA (female) | RP-SMA (male) | SMA (female) | SMA (male)

More Information about Antennas and Power Control

If you are planning to extend the range or widen the coverage of your wireless connection, then you may need to use external high-gain antennas for your access points. In addition to the antenna type and gain, there are a few other specifications that you should consider.

Frequency Range

The most important parameter of an antenna is its working frequency. If you use a 2.4G antenna for IEEE 802.11a applications, you will find that the signal is too weak and the data rate falls back to a very low level. Be sure to use the right antenna for your planned working frequency.

Half-power Beam Width (HPBW)

This parameter is measured from the antenna’s radiation pattern, and refers to the beam width at which the antenna’s radiation drops to half of its peak value. It also refers to the antenna’s effective coverage area. Once you get outside the half-power beam width, the signal typically drops off very quickly. A very high-gain antenna has a very narrow-angled half-power beam width, which makes the directionality high as well.

Antenna Polarity

Polarization refers to the direction in which the electromagnetic field lines point as energy radiates away from the antenna. The simplest and most common type is linear polarization. When power is sent from transmitter to receiver, only that portion of the beam with the same polarization can be received. An improper antenna installation may decrease performance.

Equivalent Isotropically Radiated Power (EIRP)

The EIRP value is defined as the power transmitted by a theoretical isotropic antenna that distributes power evenly in all directions and emits and produces the peak power density observed in the direction of maximum antenna gain. The government makes radiation/telecommunication regulations and controls the EIRP of radio devices. You must ensure that your wireless system does not exceed legal EIRP values. The EIRP value is also used to estimate the service area of the transmitter and to coordinate transmitters on the same frequency so that their coverage areas do not overlap. EIRP is calculated EIRP by measuring the power of the transmitter, losses in transmission lines and connectors, and the gain of the antenna. The unit used for EIRP and transmitter power is dBm, cable loss is measured in dB, and antenna gain is expressed in dBi, relative to a (theoretical) isotropic reference antenna.

IEEE 802.11 Antennas

	IEEE 802.11b/g 2.4GHz Wireless Antennas				IEEE 802.11a/b/g 2.4/5 GHz Dual-band Antennas		IEEE 802.11a 5GHz Wireless Antennas	
Product Name	ANT-WSB-AHRM-05-1.5m	ANT-WSB-ANF-09	ANT-WSB-PNF-12	ANT-WSB-PNF-18	ANT-WDB-ANF-0609	ANT-WDB-PNF-1518	ANT-WSB5-ANF-12	ANT-WSB5-PNF-18
Frequency Range	2.4 to 2.5 GHz	2.4 to 2.5 GHz	2.4 to 2.5 GHz	2.4 to 2.5 GHz	2.4 to 2.5 / 5.1 to 5.9 GHz	2.4 to 2.5 / 5.1 to 5.9 GHz	5.1 to 5.9 GHz	5.1 to 5.9 GHz
Antenna Type	λ/4 Dipole	Omni-directional	Directional, Panel	Directional, Panel	Omni-directional	Directional, Panel	Omni-directional	Directional, Panel
Typical Antenna Gain	5 dBi	9 dBi	12 dBi	18 dBi	6/9 dBi	15/18 dBi	12 dBi	18 dBi
Impedance	50±5 ohms	50±5 ohms	50±5 ohms	50±5 ohms	50±5 ohms	50±5 ohms	50±5 ohms	50±5 ohms
Polarization Linear	Vertical	Linear	Linear	Linear	Linear	Linear	Linear	Linear
HPBW/ Horizontal	360°	360°	50°	30°	360°	50/10°	360°	10°
HPBW/ Vertical	---	10°	30°	20°	10/8°	30/10°	6°	10°
V.S.W.R.	λ2.0	1 : 1.3 Max.	1 : 1.5 Max.	1 : 1.5 Max.	1 : 1.5 Max.	1 : 1.5 Max.	1 : 1.3 Max.	1 : 1.5 Max.
Power Handling	---	15 W Max.	10 W Max.	15 W Max.	10 W Max.	20 W Max.	10 W Max.	10 W Max.
Connector(s)	RP-SMA (male)	N-type (female)	N-type (female)	N-type (female)	N-type (female)	N-type (female)	N-type (female)	N-type (female)
Operating Temperature	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C
IP Rating	---	IP65	IP65	IP65	IP65	IP65	IP65	IP65
Antenna Profile	---	420 mm length	215 x 90 x 30 mm	270 x 205 x 15 mm	260 mm length	270 x 205 x 15 mm	420 mm length	270 x 205 x 15 mm
Weight	300 g	430 g	560 g	1020 g	155 g	1020 g	430 g	990 g

Cellular Antennas

	GSM/GPRS Cellular Antennas				UMTS/HSDPA/WCDMA Cellular Antennas	
Product Name	ANT-CQB-ASM-01	ANT-CQB-AHSM-00-3m	ANT-CQB-AHSM-03-3m	ANT-CQB-AHSM-05-3m	ANT-WCDMA-ASM-1.5	ANT-WCDMA-AHSM-04-2.5m
Frequency Range	850/900/1800/1900 MHz	850/900/1800/1900 MHz	850/900/1800/1900 MHz	850/900/1800/1900 MHz	850/900/1800/1900/2100 MHz	850/900/1800/1900/2100 MHz
Cable Type	---	RG174/U	RG174/U	RG174/U	---	RG174/U
Typical Antenna Gain	max. 1 dBi	0 dBi	3 dBi	5 dBi	1.5 dBi	4 dBi
Impedance	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms
Polarization Type	Linear	Linear	Linear	Linear	Vertical	Vertical
V.S.W.R.	---	< 2	< 2	< 2	1 : 6.4	< 2
Connector(s)	SMA(M)	SMA(M)	SMA(M)	SMA(M)	SMA(M)	SMA(M)
Antenna Profile	3.3 mm length	100 mm length	250 mm length	370 mm length	104 mm length	110 mm length
Cable Length	---	3 m	3 m	3 m	---	2.5 m

Terminal Block Accessories

3-pin Terminal Block

Fasteners: Screw type
P/N: 1111000005200

5-pin Terminal Block

Fasteners: Screw type
P/N: 1111000005400

10-pin Terminal Block

Fasteners: Screw type
P/N: 1111211021212

Power Jack to Terminal Block Power Cable

Cable Length: 100 ± 20 mm
Bare Wire Length: 7..5 ± 1 mm
P/N: 1701040110010

Optional Accessories (can be purchased separately)

CRF- N0117SA-3M: CFD200 cable, N-type (male) to RP-SMA (male), 3 meters (for AWK-3121/3222 and NPort® W series)
Note: This cable is required for connecting to an optional antenna for devices that have an RP-SMA connector.

CRF-N0429N-3M: CFD400 cable, N-Male to N-Male connector, 3 meters (for outdoor AWK series products)
Note: This cable is required for connecting to an optional antenna for devices that have an N-type connector.

WK-HA-1002SU: Swivel Mounting Kit, swivel angle 90° horizontal, 40° vertical
Note: Supports ANT-WSB-PNF-12 by adjusting the angle for use with different wireless applications.

An Overview of Embedded Computing

An Overview of Embedded Computing

Introduction to Embedded Computers 14-2

Complete Service and Support

Rcore—Moxa's Embedded Software Platform 14-5

Moxa Device Manager 14-6

Real Industrial-grade Hardware Design 14-8

Customized Service for Embedded Computers 14-10

14

An Overview of Embedded Computing

Introduction to Embedded Computers

Moxa's embedded computers are all-in-one devices that handle special purpose computing tasks for industrial applications. The computers use either the RISC-based ARM9, Intel XScale, Cirrus Logic, or X86 processor to provide powerful communication and computing functions. In addition, an ample number of serial ports that support different interfaces are available for connecting a variety of industrial devices to a network for demanding numerical computing, protocol conversion, and data processing tasks. Some of Moxa's embedded computers even come with a USB 2.0 port, CompactFlash, SD interfaces for storage expansion, and a PCMCIA socket for adding wireless communication capability, and the pre-built, ready-to-run Linux, Windows CE, or Windows XP Embedded platforms are easy to access, so that software programmers can concentrate on developing their own application programs.

Ready-to-Run Platform

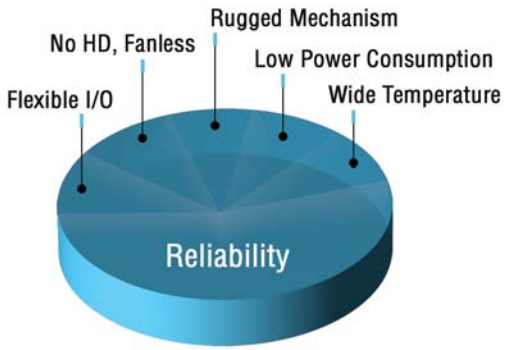
It takes the right hardware and software to optimize any embedded computing application. While each series in our embedded computing family may have unique properties of its own, all Moxa embedded computers share the following features to maximize reliability and efficiency.

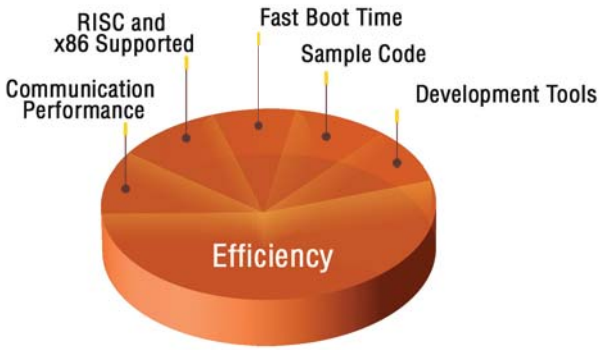
Rcore Embedded Software Platform

Moxa's Rcore provides users with an integrated ready-to-run embedded platform that speeds up and reduces the effort required for system development for faster time-to-market.

Real Industrial-grade Hardware Design

Moxa's real industrial design supports features that provide users with a reliable platform for building the most optimal embedded solutions at the lowest cost. The robust hardware design and easy-to-use software tools make Moxa's embedded computers ideal for establishing embedded systems quickly and effortlessly.

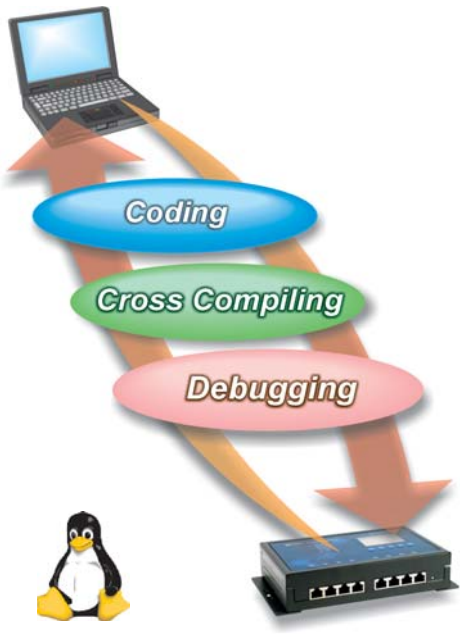




Embedded Computing with Open Source Linux

Open source Linux architecture for easy development

The pre-installed Linux OS provides an open source software operating system for your software development. This means that software written for the desktop PC is easily ported to Moxa's embedded computers by performing a GNU cross compile without needing to modify the code.



How to develop your application with tool chains

Step 1: Set up the development environment

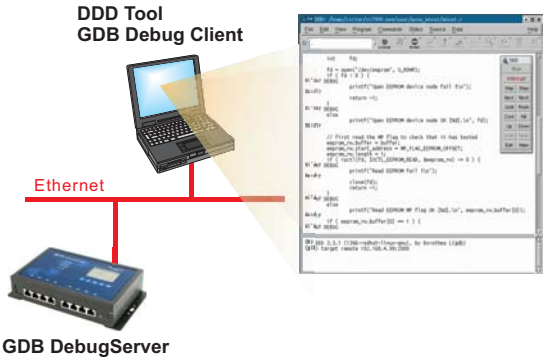
- Install Linux on your PC (Redhat 7.2 or above is recommended)
- Install the tool chain (Cross compiler, GlibC, GDB), included on the CD-ROM, to your Linux PC
- Configure the IP, Netmask, etc.

Step 2: Set up the development environment

- Develop a C or C++ user application on your PC
- Compile C programs and link to the library with the Moxa tool chain.

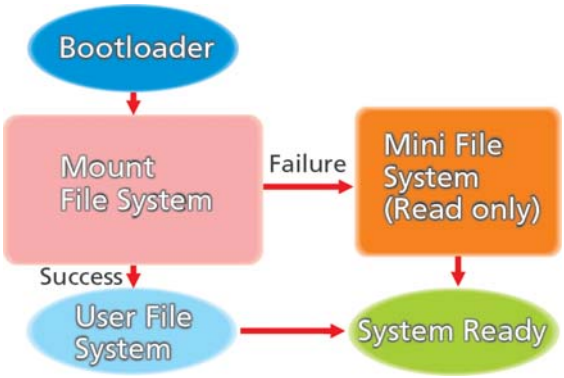
Step 3: Deployment

- Download the program to your Moxa embedded computer via FTP
- Your Moxa embedded computer, with customized application, is ready to go!



Source level debugging

Moxa's embedded computers (UC-7400 Series, UC-7400 Plus Series, DA-660 Series, IA240 Series, IA260 Series, and UC-8410 Series) have a built-in GDB server that enables software developers to use freeware, such as DDD in Linux environments, for source level debugging.



Embedded web server for web applications

Moxa's embedded computers have a pre-installed web server daemon that lets you set up your web application easily. Edit your web application with any familiar web tool, and then download the site to the Moxa embedded computer. Enjoy the benefits of web applications that are viewable with any popular web browser.

Robust self-recovery file system

Moxa's embedded computers provide a self-recovery file system to ensure reliable operation. There are two file systems inside. One is the User File System, and the other is a Mini File System. If mounting the user file system fails, Moxa's embedded computers will auto-boot from the Mini File System to ensure a successful boot-up.

Embedded Computing with Windows Embedded

In addition to being part of the Linux community, the Moxa embedded computer family also includes models running the Microsoft® Windows® Embedded operating system. Adopting a widely used programming environment makes our embedded computers suitable for software development and legacy system migration.

Easier Application Development with IDE Tools

Software written for the desktop PC can be easily ported to a Moxa embedded computer with very little or even no modifications. Both porting and new development can be done using any number of friendly Integrated Development Environment (IDE) tools. Choose the tools based on the application language you plan to use and install them on your development PC. For detailed installation steps, please refer to the user's manual.

C/C++ Applications:

Using Embedded Visual C++ (eVC) 4.0

The eVC 4.0 tools can be downloaded for free from MSDN's download page. Install the eVC 4.0 tools and import service pack 4. Note that eVC is used for CE versions under 5.0.

Using Visual Studio 2005 or Visual Studio 2008

Microsoft Visual Studio 2005/2008 is a complete set of development tools for building C/C++ applications. You can develop WinCE applications with the Moxa SDK using Visual Studio 2005/2008 for WinCE 5.0/6.0/XPe.

VB.NET/C# Applications:

Using Visual Studio 2005 or Visual Studio 2008

Microsoft Visual Studio 2005/2008 is a complete set of development tools for building ASP.NET Web applications, XML Web services, and mobile applications. Visual Basic, Visual C++, Visual C#, and Visual J# (XPe only) all use the same IDE, which allows them to share tools and facilities when creating mixed-language solutions.

If you are building applications under WinCE, after installing the IDE tool you will also need to install a Windows Embedded SDK (provided by Moxa) on your development PC. After doing so, the SDK will be integrated with your IDE tool.

The Win CE SDK includes C libraries and run-time libraries, Microsoft Foundation Classes (MFC), SOAP Toolkit, .NET Compact Framework, XML, and Winsock for you to develop your applications.

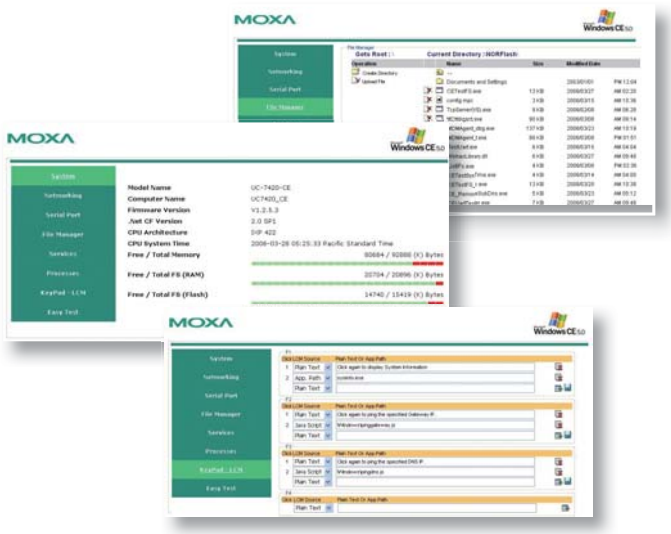
Web-based Management System

Moxa's embedded computers are network-centric programmable platforms designed to be used as front-end computers for data acquisition and industrial control. The embedded computer is often located away from the system administrator in the same harsh environment as the controlled devices. This makes the task of managing the computer remotely an important aspect of the embedded computer's operation.

To resolve this remote management issue and reduce the work load of the system administrator, the Moxa embedded computer is installed with a Web-based management system. The system incorporates often-used features into an internal site and categorizes the features on a menu bar, as shown in the accompanying figures.

- System Information
- Networking/Server Configuration
- Process (Thread) Monitoring/Control
- Services Monitoring/Control
- Binary/Text File Management and Upload

This web-based management system allows you to manage web sites, the registry database for system and application programs, and many other aspects of the computer's operation.



Rcore—Moxa's Embedded Software Platform

Take advantage of Moxa's Rcore platform to increase your competitiveness and ensure a faster time-to-market. The Rcore platform provides the following hard-to-beat benefits:

- Easy-to-use application libraries
- Proven and bug-free sample code
- Consulting-level advice for application development
- Fast concept validation and development cycle

Operating Systems

Moxa's x86 and ARM embedded computers offer a powerful computing environment and stable system for a variety of industrial applications. These computers use either a Linux or Windows (CE and XPe) embedded operating system to provide programmers around the world with a user-friendly environment for application development, and help reduce the effort required for system integration. Moxa continues to look for real-time operating systems that are suitable for mission critical applications.

Middleware

Moxa offers a variety of middleware to help you easily integrate these application modules into your system. This is essential for leveraging the profound features of these modules and reducing the effort required for application development. The VPN (OpenVPN, L2TP, and IPSec) middleware makes it easy for user applications to create secure tunnels between communication parties. The firewall (iptable) middleware protects enterprise information from un-friendly access. The database system (MySQL and MSSQL) middleware can be used to manage field-data acquisition, with web services (Web, PHP, ASP) included to give programmers an integration framework for building Internet accessible field applications, such as WebSCADA.

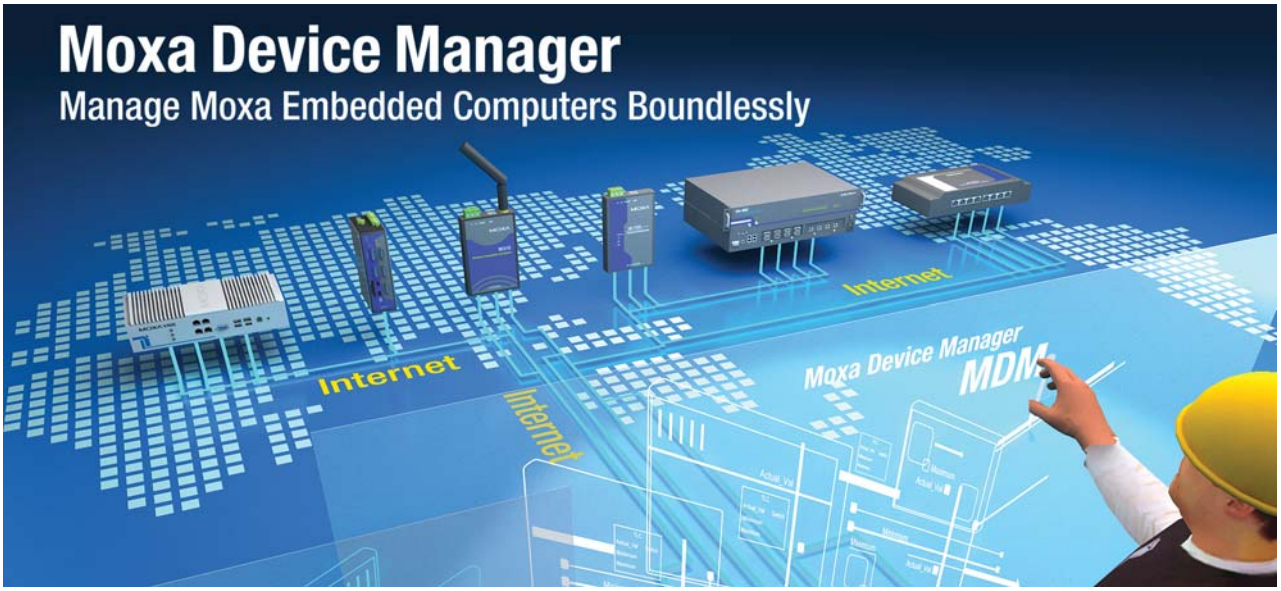
Sample Code

To lower customers' development cost, Moxa provides sample code for a wide range of embedded applications, such as serial-to-Ethernet (S2E), serial-to-serial (S2S), and Modbus TCP and RTU. This high-level sample code or application libraries hide the details of implementing complex data communication by presenting relatively simple function prototypes for user applications. In addition, low-level libraries that manage direct access to peripheral I/O devices, such as LCM, key pad, digital IO signals, and watchdog functions, are also included. With ready access to such a rich assortment of embedded applications, programmers obtain a much greater flexibility than would otherwise be possible. These libraries help programmers quickly grasp the full functionality of their applications, and in this way gain the confidence needed to complete their project, essentially speeding up product development and ensuring that code is efficient and bug-free.

Tools

Moxa provides a Windows PC-based tool (MDM) that auto-detects, configures, and manages Moxa's embedded computers over an Internet environment. This tool provides features for setting IP addresses, managing files, monitoring memory usage of computers, and helping application developers deploy their programs en masse to an entire army of computers.

Moxa Device Manager



Systems that incorporate several devices located at remote sites present a big challenge to solution providers. This is particularly true for industrial applications that use several headless embedded computers distributed over a wide area. Although this type of computer is generally accessible from over the network, the existing remote management options present a rather clumsy solution for managing large numbers of embedded computers.

The Telnet/SSH Solution

Perhaps the most common method of managing embedded computers remotely over the network is to use Telnet/SSH. However, one of the main drawbacks to this type of management is that you can only connect to one embedded computer at a time. In addition, the administrator must actively type in the IP address of the embedded computer to establish the Telnet/SSH connection. It can be a real nightmare to keep track of which IP address is associated with which embedded computer.

The Command Line Solution

Another method of managing an embedded computer includes working from the command line. Although this can be done from over the network, most administrators find it difficult to remember all of the commands that are required to manage files and run programs. Script files that combine several commands in one text file can be used to automate the command line method, but this option can also be quite time-consuming for administrators that manage tens if not hundreds of machines.

Using MDM (Moxa Device Manager) to Manage Embedded Computers

Moxa Device Manager (MDM for short) is an easy-to-use remote management tool for managing Moxa's ready-to-run embedded computers over the Internet. Moxa's embedded computers make excellent front-end computers at remote sites for on-site data collection and industrial control applications. MDM is designed to make it easy for system administrators to manage their remote embedded computers. One of the key benefits of MDM is that management tasks, such as configuring the network, managing and/or transmitting text and binary files, and monitoring and controlling processes, can be handled easily using a Windows-based user interface. In addition, MDM can be used to manage different models of embedded computer, and embedded computers that use different operating systems, all from one centrally located computer. As long as the individual embedded computers are pre-installed with an MDM agent, they can be recognized and managed by the unified MDM tool from your PC. These features help ensure that MDM gives system integrators an efficient tool for handling all remote devices from one computer.

In addition to controlling heterogeneous computer systems, the traffic between the MDM tool and any of the MDM agents is encrypted. This feature protects data transmitted from the system. Users can comfortably manage the remote devices without worrying about the usual risks associated with transmitting data over a network.

The Benefits of MDM

Remote Control and Management

- Supports all models of Moxa embedded computer and Linux, WinCE, WinXPe operating systems
- Control and monitor remote embedded units over the Internet
- Broadcast search for Moxa embedded computers on the same LAN
- Get instant device status
- List basic information (IP, Model, Firmware version, OS, Hostname CPU, product image, memory information, and storage information) of all devices on the main page

Command-line Free Configuration and Maintenance

- Launch programs automatically when booting up
- One-to-multiple file transfers
- Perform remote file system management
- Configure network interfaces
- Monitor and kill processes
- View detailed system information
- Reboot devices
- Upgrade firmware for multiple devices at one time
- Update system time

Easy-to-use User Interface

- Friendlier “click and operate” interface for remote device management
- Friendly windows-based utilities for easy configuration

Easy Installation and Setup

- An MDM Agent program running on an embedded computer can be started automatically at boot-up
- MDM Tool and Gateway can be installed on any PC running Windows XP

How to Get MDM

Moxa Device Manager comes with MDM Agent, MDM Tool, and MDM Gateway. Users can download the Moxa Device Manager package from the “Support → Software” page on Moxa’s website.

Real Industrial-grade Hardware Design

Besides Rcore, Moxa's "real industrial design" supports features that provide users with a reliable platform for building the most optimal embedded solutions at the lowest cost. The robust hardware design and easy-to-use software tools make Moxa's embedded computers ideal for establishing embedded systems quickly and effortlessly.

Communication Cores

Serial Ports

Serial communication is one of Moxa's core technologies, and has helped millions of serial devices connect to the network for industrial applications. Our RS-232/422/485 serial ports provide powerful communication performance for all industrial device connectivity.

Ethernet Ports (switch ports & LAN ports)

Both switch ports and LAN ports are available on some models to offer a diverse range of network communication options, helping users easily create an integrated industrial application that requires Ethernet protocols.

DI/DO Channels

Moxa's DI/DO channels are designed with 3 KV of optical isolation protection to ensure that your system operates safely and reliably. These DI/DO channels are quite useful for activating remote motion triggers.

CAN Ports

Moxa also provides embedded computers with CAN ports for connecting remote devices. The CAN port models are suitable for industrial automation applications that require the CANOpen protocol.

Fit for Harsh Enviroments

Wide Temperature

Moxa's embedded computers are designed to withstand temperatures ranging from -40 to 75°C for use in extremely hot or cold environments. One popular use is with applications that require installing the computers in roadside cabinets.

Low Power Consumption

The components of Moxa's embedded computers are chosen to meet industrial-grade demands. To achieve this task, Moxa uses a fanless, cable-less, no hard disk design that guarantees stable system operation, but without generating too much heat.

Anti-vibration and Anti-shock Design

Moxa's embedded computers have an industrial-grade, rugged design that can endure continuous 5G vibration, and also provide a 50G anti-shock guarantee, making them the best embedded computer solution for industrial environments that experience strong vibrations. These computers can also be used as the core computer for applications that require installing the embedded computer on moving objects.

Isolation

Isolation protection is a key part of creating a secure communication platform. All of Moxa's communication interfaces are well-protected with different isolation standards. All serial ports come with 15 KV ESD protection for all signals, Ethernet ports come with 1.5 KV magnetic protection, and DI/DO channels have 3 KV optical isolation protection. These features make Moxa's embedded computers the ideal solution for providing stable and reliable industrial communication.

Robust Design

EMI

Electromagnetic interference presents a big challenge for engineers who design and develop embedded systems. Moxa's embedded computers use industrial-grade components that meet all international EMI standards and directives to reduce radiation effects and provide a reliable embedded platform for any industrial application.

Cable-less

The cable-less concept offers a strong hardware design and promises a reliable combination of embedded components. This design helps ensure stable system operation and robust hardware design, since all of the components are firmly attached. This is especially beneficial for applications that require installing the computer on moving objects.

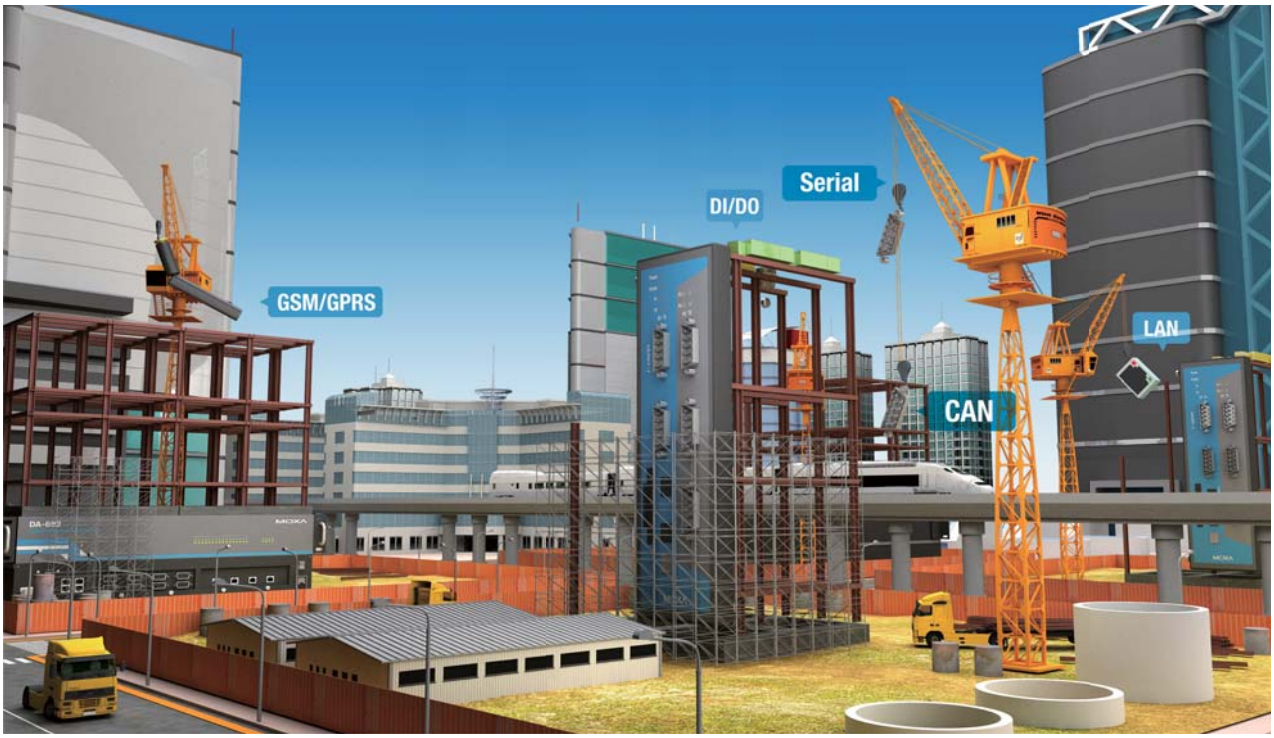
Fanless

A fanless design is a major requirement for industrial solutions. Moxa focuses on choosing the finest components that generate less heat but can still maintain high system performance. The fanless design makes Moxa's embedded computers ideal solutions for applications that experience extremely hot or cold environments.

Compact Design

Moxa's industrial embedded computers have a compact form factor, making them ideal for both indoor and outdoor industrial environments, especially at field sites that do not have a lot of extra space. Moxa has made its mark in the embedded market by providing computers that are compact yet powerful, and can be used in any industrial environment.

Customized Service for Embedded Computers



Moxa's professional technical support has made us one of the world leaders in the industrial networking and communication industry. With more than 20 years of R&D experience, we are able to offer a greater variety of off-the-shelf solutions to meet the requirements of your industrial applications.

In recent years, we have received many requests for customized products and solutions that involve our embedded computing products. This is an indication to us that people in the industrial automation industry recognize the true value provided by our products and services.

If you are looking for new ways to grow your business and increase your value, then Moxa's new DTO (designed to order) service may be for you. This new service, as it applies to our embedded computers, has been established to provide more customer-oriented embedded products and services by giving our customers the flexibility they require for their industrial embedded computing applications.

As a world-class leader in industrial communication and networking technology, Moxa's expertise includes the development of modular technology for a variety of CPU platforms, which allows us to provide high quality products, individual technology, and high quality service.

What does Moxa's Customized Service Offer?

High Quality Products

-Over 20 years of experience
-Solid 5-year warranties
-Low RMA

Specialized Technology

-Expertise in computing, communication and control
-Value added software platform
-Designed for harsh environments

High Quality Service

-Quick response
-Customer centric

Embedded Computers for Communication

Product Selection Guides

Wallmount Computers 15-2
Rackmount Computers 15-5
Module/Board Computers 15-7

Wallmount Solutions

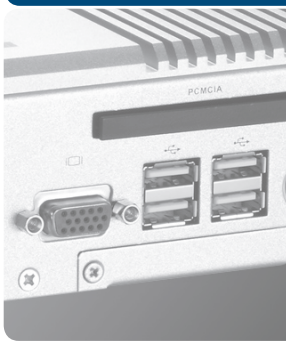
V462 Series x86-based, 4 serial ports, 2 LANs, VGA, CompactFlash, PCMCIA, USB . . 15-8
V464 Series x86-based, 4 serial ports, 4 LANs, VGA, CompactFlash, USB 15-11
V466 Series x86-based, 4 serial ports, 4 LANs, VGA, CompactFlash, 8-port switch, USB 15-14
V468 Series x86-based, 4 serial ports, 4 LANs, VGA, DIO, CompactFlash, USB 15-18
V481 Series x86-based, 8 serial ports, 2 LANs, VGA, CompactFlash, USB, audio . . . 15-21
UC-8410 Series RISC-based, 8 serial ports, 3 LANs, DIO, CompactFlash, USB 15-25
UC-8416 Series RISC-based, 8 serial ports, 3 LANs, DIO, 8-port switch, CompactFlash, USB 15-28
UC-8418 Series RISC-based, 8 serial ports, 3 LANs, DIO, 2 CAN ports, CompactFlash, USB 15-31
UC-7402 Series RISC-based, built-in web server, 2 LANs, PCMCIA, CompactFlash . 15-34
UC-7408 Series RISC-based, 8 serial ports, DIO, 2 LANs, PCMCIA, CompactFlash . 15-36
UC-7410/7420 Series RISC-based, 8 serial ports, 2 LANs, USB, PCMCIA, CompactFlash 15-39
UC-7122/7124 Series Mini RISC-based computer, 2 LANs, 2 or 4 serial ports, SD, USB 15-42
UC-7110/7112 Series Mini RISC-based computer, 2 serial ports, 2 LANs, SD 15-45
UC-7101 Series Mini RISC-based computer, 1 serial port, LAN, SD, µClinux 15-48

Rackmount Solutions

DA-681 Series x86-based, 4 RS-232 and 8 RS-485 ports, 6 LANs, VGA, CompactFlash, USB 15-51
DA-682 Series x86-based, VGA, 4 Gigabit Ethernet ports, 2 expansion slots, Compact-Flash, USB 15-54
DA-660/661/662/662-I RISC-based, 8 or 16 serial ports, Ethernet/fiber LAN, PCMCIA, CompactFlash, USB 15-58

Module/Board Solutions

EM-2260 Series RISC-based, 4 serial ports, DIO, 2 LANs, VGA, CompactFlash, USB 15-62
EM-1240 Series RISC-based, 4 serial ports, 2 LANs, SD, µClinux 15-65
EM-1220 Series RISC-based, 2 serial ports, 2 LANs, SD, µClinux 15-68



Wallmount Computers

	V462-CE V462-T-CE	V462-XPE V462-T-XPE	V464-CE V464-T-CE	V464-XPE V464-T-XPE	V466-CE V466-T-CE	V466-XPE V466-T-XPE	V468-CE V468-T-CE	V468-XPE V468-T-XPE	V481-CE V481-T-CE	V481-XPE V481-T-XPE
Computer										
CPU Speed	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz	1 GHz	1 GHz
OS (pre-installed)	WinCE 6.0	WinXP Emb.	WinCE 6.0	WinXP Emb.	WinCE 6.0	WinXP Emb.	WinCE 6.0	WinXP Emb.	WinCE 5.0	WinXP Emb.
DRAM	---	---	---	---	---	---	---	---	---	---
SRAM	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB	---	---
FSB	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz
Flash	---	---	---	---	---	---	---	---	---	---
System Memory	256 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)
PCMCIA	√	√	---	---	---	---	---	---	---	---
Expansion Bus	PC/104-Plus onboard									
USB Ports	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)
Digital I/O	---	---	---	---	---	---	8 DIs, 8 DOs	8 DIs, 8 DOs	---	---
Storage										
Built-in	256 MB	1 GB	256 MB	1 GB	256 MB	1 GB	256 MB	1 GB	256 MB	1 GB
CompactFlash Socket	√	√	√	√	√	√	√	√	√	√
SD Slot	---	---	---	---	---	---	---	---	---	---
Other Peripherals										
KB/MS	1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable									
Audio	AC97 audio, with speaker-out interface									
Display										
Graphics Controller	√	√	√	√	√	√	√	√	√	√
Mini Screen with Push Buttons	---	---	---	---	---	---	---	---	---	---
LAN Interface										
10/100 Mbps Ethernet Ports	2	2	4	4	4	4	4	4	1	1
10/100/1000 Mbps Ethernet Ports	---	---	---	---	---	---	---	---	1	1
Switch Ports	---	---	---	---	8	8	---	---	---	---
Controller	Realtek RTL8100CL								---	---
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface										
RS-232 Ports	2 (DB9 male)	2 (DB9 male)	2 (DB9 male)	2 (DB9 male)	2 (DB9 male)	2 (DB9 male)	2 (DB9 male)	2 (DB9 male)	---	---
RS-485	---	---	---	---	---	---	---	---	---	---
RS-232/422/485 Ports	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	8 (DB9-M)	8 (DB9-M)
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Digital Isolation	---	---	---	---	---	---	---	---	---	---
Console Port	---	---	---	---	---	---	---	---	---	---
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark									
Flow Control	RTS/CTS, XON/XOFF, ADDC®									
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)									
CANbus	---	---	---	---	---	---	---	---	---	---
LEDs										
System	Power, Battery, Storage								Power, Storage	
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M, Switch		10M, 100M	10M, 100M	10M, 100M	10M, 100M
Serial	---	---	---	---	---	---	---	---	---	---
Physical Characteristics										
Housing	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
Weight	1.32 kg	1.32 kg	1.32 kg	1.32 kg	1.32 kg	1.32 kg	1.32 kg	1.32 kg	2.2 kg	2.2 kg
Dimensions	223 x 120.5 x 57 mm								225 x 140 x 70 mm	
Mounting	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall
Environmental Limits										
Operating Temperature	-10 to 60°C or -40 to 75°C								-10 to 60°C or -35 to 75°C	
Operating Humidity	5 to 95% RH									
Storage Temperature	-20 to 80°C or -40 to 85°C									
Anti Vibration/Shock	---	---	---	---	---	---	---	---	---	---
Regulatory Approvals										
EMC	CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)									
Safety	UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD, CCC (GB4943)								UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)	
Green Product	---	---	RoHS, WEEE							
Reliability										
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√	√	√
Warranty	5 years (see www.moxa.com/warranty)									

Wallmount Computers

	UC-8410-LX UC-8410-T-LX	UC-8416-LX UC-8416-T-LX	UC-8418-LX UC-8418-T-LX	UC-7402-LX	UC-7402-LX Plus	UC-7408-LX UC-7408-T-LX	UC-7408-LX Plus UC-7408-T-LX Plus	UC-7408-CE UC-7408-T-CE	UC-7410-LX	UC-7410-LX Plus
Computer										
CPU Speed	533 MHz	533 MHz	533 MHz	266 MHz	533 MHz	266 MHz	533 MHz	266 MHz	266 MHz	533 MHz
OS (pre-installed)	Linux			Embedded Linux				WinCE 5.0	Embedded Linux	
DRAM	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB
SRAM	---	---	---	---	---	---	---	---	---	---
FSB	---	---	---	---	---	---	---	---	---	---
Flash	16 MB (OS); 32 MB (data)	16 MB (OS); 32 MB (data)	16 MB (OS); 32 MB (data)	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB
System Memory	---	---	---	---	---	---	---	---	---	---
PCMCIA	---	---	---	√	√	√	√	√	---	---
Expansion Bus	---	---	---	---	---	---	---	---	---	---
USB Ports	---	---	---	---	---	---	---	---	---	---
Digital I/O	4 DIs, 4 DOs	4 DIs, 4 DOs	12 DIs, 12 DOs	---	---	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	---	---
Storage										
Built-in	---	---	---	---	---	---	---	---	---	---
CompactFlash Socket	√	√	√	√	√	√	√	√	---	---
SD Slot	---	---	---	---	---	---	---	---	---	---
Other Peripherals										
KB/MS	---	---	---	---	---	---	---	---	---	---
Audio	---	---	---	---	---	---	---	---	---	---
Display										
Graphics Controller	---	---	---	---	---	---	---	---	---	---
Mini Screen with Push Buttons	---	---	---	---	---	---	---	---	√	√
LAN Interface										
10/100 Mbps Ethernet Ports	3	3	3	2	2	2	2	2	2	2
10/100/1000 Mbps Ethernet Ports	---	---	---	---	---	---	---	---	---	---
Switch Ports	---	8	---	---	---	---	---	---	---	---
Controller	---	---	---	---	---	---	---	---	---	---
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface										
RS-232 Ports	---	---	---	---	---	---	---	---	---	---
RS-485	---	---	---	---	---	---	---	---	---	---
RS-232/422/485 Ports	8 (RJ45)	8 (RJ45)	8 (RJ45)	---	---	8 (RJ45)	8 (RJ45)	8 (RJ45)	8 (RJ45)	8 (RJ45)
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Digital Isolation	---	---	---	---	---	---	---	---	---	---
Console Port	√	√	√	√	√	√	√	√	√	√
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark			---	---	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark				
Flow Control	RTS/CTS, XON/XOFF, ADDC®			---	---	RTS/CTS, XON/XOFF, ADDC®				
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)			---	---	50 bps to 921.6 Kbps (non-standard baudrates supported)				
CANbus	---	---	2 (DB9-M)	---	---	---	---	---	---	---
LEDs										
System	Power, Ready, Storage, Battery			OS Ready						
LAN	10M, 100M			10M, 100M						
Serial	TxD, RxD			TxD, RxD						
Physical Characteristics										
Housing	SECC sheet metal (1 mm)									
Weight	850 g	930 g	1 kg	830 g	830 g	870 g	870 g	870 g	810 g	810 g
Dimensions	200 x 36.5 x 120 mm	200 x 56 x 120 mm		197 x 44 x 125 mm						
Mounting	DIN-Rail, wall			DIN-Rail, wall						
Environmental Limits										
Operating Temperature	-10 to 60°C or -40 to 75°C			-10 to 60°C		-10 to 60°C or -40 to 75°C			-10 to 60°C	
Operating Humidity	5 to 95% RH			5 to 95% RH		5 to 95% RH			5 to 95% RH	
Storage Temperature	-20 to 80°C or -40 to 85°C			-20 to 80°C		-20 to 80°C			-20 to 80°C	
Anti Vibration/Shock	1g/5g	1g/5g	1g/5g	1g/5g	1g/5g	1g/5g	1g/5g	1g/5g	1g/5g	1g/5g
Regulatory Approvals										
EMC	CE (EN55022 Class B, EN55024-4-2, EN55024-4-3, EN55024-4-4), FCC (Part 15 Subpart B, Class B)			CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)						
Safety	UL/cUL (UL60950-1), CCC, LVD			UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)						
Green Product	RoHS, CRoHS, WEEE									
Reliability										
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√	√	√
Warranty	5 years (see www.moxa.com/warranty)									

Wallmount Computers

	UC-7420-LX	UC-7420-LX Plus	UC-7410-CE	UC-7420-CE	UC-7122-CE UC-7122-T-CE	UC-7124-CE UC-7124-T-CE	UC-7110-LX UC-7110-T-LX	UC-7112-LX	UC-7112-LX Plus	UC-7101-LX UC-7101-T-LX
Computer										
CPU Speed	266 MHz	533 MHz	266 MHz	533 MHz	200 MHz	200 MHz	192 MHz	192 MHz	192 MHz	192 MHz
OS (pre-installed)	Embedded Linux		WinCE 5.0				µClinux		Linux	µClinux
DRAM	128 MB	128 MB	128 MB	128 MB	32 MB	32 MB	16 MB	16 MB	32 MB	16 MB
SRAM	---	---	---	---	---	---	---	---	---	---
FSB	---	---	---	---	---	---	---	---	---	---
Flash	32 MB	32 MB	32 MB	32 MB	16 MB	16 MB	8 MB	8 MB	16 MB	8 MB
System Memory	---	---	---	---	---	---	---	---	---	---
PCMCIA	√	√	---	√	---	---	---	---	---	---
Expansion Bus	---	---	---	---	---	---	---	---	---	---
USB Ports	---	---	---	---	---	---	---	---	---	---
Digital I/O	---	---	---	---	---	---	---	---	---	---
Storage										
Built-in	---	---	---	---	---	---	---	---	---	---
CompactFlash Socket	√	√	---	√	---	---	---	---	---	---
SD Slot	---	---	---	---	√	√	---	√	√	√
Other Peripherals										
KB/MS	---	---	---	---	---	---	---	---	---	---
Audio	---	---	---	---	---	---	---	---	---	---
Display										
Graphics Controller	---	---	---	---	---	---	---	---	---	---
Mini Screen with Push Buttons	√	√	√	√	---	---	---	---	---	---
LAN Interface										
10/100 Mbps Ethernet Ports	2	2	2	2	2	2	2	2	2	1
10/100/1000 Mbps Ethernet Ports	---	---	---	---	---	---	---	---	---	---
Switch Ports	---	---	---	---	---	---	---	---	---	---
Controller	---	---	---	---	---	---	---	---	---	---
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface										
RS-232 Ports	---	---	---	---	---	---	---	---	---	---
RS-485	---	---	---	---	---	---	---	---	---	---
RS-232/422/485 Ports	8 (RJ45)	8 (RJ45)	8 (RJ45)	8 (RJ45)	2 (RJ45)	4 (RJ45)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Optical Isolation	---	---	---	---	---	---	---	---	---	---
Console Port	√	√	√	√	√	√	√	√	√	√
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark									
Flow Control	RTS/CTS, XON/XOFF, ADDC®									
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)									
CANbus	---	---	---	---	---	---	---	---	---	---
LEDs										
System	OS Ready				Ready, SD		OS Ready			Ready
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M
Serial	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics										
Housing	SECC sheet metal (1 mm)				Aluminum (1 mm)					
Weight	875 g	875 g	875 g	875 g	190 g	200 g	190 g	190 g	190 g	130 g
Dimensions	197 x 44 x 125 mm				77 x 111 x 26 mm					67 x 22 x 100.4 mm
Mounting	DIN-Rail, wall				DIN-Rail, wall					DIN-Rail, wall
Environmental Limits										
Operating Temperature	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C or -40 to 75°C					
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C		-20 to 80°C or -40 to 85°C			
Anti Vibration/Shock	1g/5g	1g/5g	1g/5g	1g/5g	---	---	---	---	---	---
Regulatory Approvals										
EMC	CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)									
Safety	UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)				LVD (EN60950-1), UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03)		UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)			LVD (EN60950-1), UL/cUL (UL60950, CAN/CSA-C22.2 No. 60950-00)
Green Product	RoHS, CRoHS, WEEE									
Reliability										
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√	√	√
Warranty	5 years (see www.moxa.com/warranty)									

Rackmount Computers

	DA-681-I-SP-CE	DA-681-I-SP-XPE	DA-681-I-SP-LX	DA-681-I-DP-CE	DA-681-I-DP-XPE	DA-681-I-DP-LX	DA-682-CE	DA-682-XPE	DA-682-LX
Computer									
CPU Speed	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz
OS (pre-installed)	WinCE 6.0	WinXP Emb. SP2	Linux	WinCE 6.0	WinXP Emb. SP2	Linux	WinCE 6.0	WinXP Emb. SP2	Linux
DRAM	---	---	---	---	---	---	---	---	---
FSB	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz
Flash	---	---	---	---	---	---	---	---	---
System Memory	512 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)
PCMCIA	---	---	---	---	---	---	---	---	---
Expansion Bus	PC/104-Plus onboard								
USB Ports	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)
Storage									
Built-in	1 GB	1 GB	1 GB	1 GB	1 GB	1 GB	256 MB	1 GB	1 GB
CompactFlash Socket	√	√	√	√	√	√	√	√	√
HDD Support	√	√	√	√	√	√	√	√	√
Other Peripherals									
KB/MS	1 PS/2 interface, supports standard PS/2 keyboard and PS/2 mouse via Y-type cable (Optional)								
Display									
Graphics Controller	√	√	√	√	√	√	√	√	√
Mini Screen with Push Buttons	---	---	---	---	---	---	---	---	---
LAN Interface									
10/100 Mbps Ethernet Ports	6	6	6	6	6	6			
10/100/1000 Mbps Ethernet Ports	---	---	---	---	---	---	4	4	4
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
100BaseFX Fiber Ports (multi-mode)	---	---	---	---	---	---	---	---	---
Serial Interface									
RS-232 Ports	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	---	---	---
RS-485	8 (TB)	8 (TB)	8 (TB)	8 (TB)	8 (TB)	8 (TB)	---	---	---
RS-232/422/485 Ports	---	---	---	---	---	---	---	---	---
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	---	---	---
Digital Isolation	2 KV	2 KV	2 KV	2 KV	2 KV	2 KV	---	---	---
Console Port	---	---	---	---	---	---	---	---	---
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark						---	---	---
Flow Control	RTS/CTS, XON/XOFF, ADDC®						---	---	---
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)						---	---	---
LEDs									
System	Ready, Storage, Power Failure (for dual power models only)						Ready, Power, Storage		
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	100M, 1000M	100M, 1000M	100M, 1000M
Serial	TX, RX	TX, RX	TX, RX	TX, RX	TX, RX	TX, RX	TX, RX	TX, RX	TX, RX
Physical Characteristics									
Housing	SECC sheet metal (1 mm)								
Weight	4.5 kg	4.5 kg	4.5 kg	4.5 kg	4.5 kg	4.5 kg	7 kg	7 kg	7 kg
Dimensions	440 x 253 x 45 mm						440 x 253 x 90 mm		
Mounting	Standard 19-inch rackmount								
Environmental Limits									
Operating Temperature	0 to 60°C	0 to 60°C	0 to 60°C	0 to 60°C	0 to 60°C	0 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 80°C	-20 to 80°C	-20 to 80°C
Regulatory Approvals									
EMC	CE (EN61000-3-2, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)								
	CE (EN55022)						CE (EN61000-6-4)		
Safety	UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)								
Green Product	RoHS, CRoHS, WEEE								
Reliability									
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√	√
Warranty	5 years (see www.moxa.com/warranty)								

Rackmount Computers

	DA-660-8-LX	DA-660-8-CE	DA-660-16-LX	DA-660-16-CE	DA-661-16-LX	DA-661-16-CE	DA-662-16-LX	DA-662-16-CE	DA-662-I-16-LX	DA-662-I-16-CE
Computer										
CPU Speed	266 MHz	266 MHz	266 MHz	266 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz
OS (pre-installed)	Emb. Linux	WinCE 5.0	Emb. Linux	WinCE 5.0	Emb. Linux	WinCE 5.0	Emb. Linux	WinCE 5.0	Emb. Linux	WinCE 5.0
DRAM	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB
FSB	---	---	---	---	---	---	---	---	---	---
Flash	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB
System Memory	---	---	---	---	---	---	---	---	---	---
PCMCIA	---	---	---	---	√	√	√	√	√	√
Expansion Bus	---	---	---	---	---	---	---	---	---	---
USB Ports	---	---	---	---	2	2	2	2	2	2
Storage										
Built-in	---	---	---	---	---	---	---	---	---	---
CompactFlash Socket	---	---	---	---	√	√	√	√	√	√
HDD Support	---	---	---	---	---	---	---	---	---	---
Other Peripherals										
KB/MS	---	---	---	---	---	---	---	---	---	---
Display										
Graphics Controller	---	---	---	---	---	---	---	---	---	---
Mini Screen with Push Buttons	√	√	√	√	√	√	√	√	√	√
LAN Interface										
10/100 Mbps Ethernet Ports	2	2	2	2	2	2	4	4	4	4
10/100/1000 Mbps Ethernet Ports	---	---	---	---	---	---	---	---	---	---
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
100BaseFX Fiber Ports (multi-mode)	---	---	---	---	---	---	---	---	---	---
Serial Interface										
RS-232 Ports	---	---	---	---	---	---	---	---	---	---
RS-485	---	---	---	---	---	---	---	---	---	---
RS-232/422/485 Ports	8 (RJ45)	8 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Digital Isolation	---	---	---	---	---	---	---	---	2 KV	2 KV
Console Port	√	√	√	√	√	√	√	√	√	√
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark									
Flow Control	RTS/CTS, XON/XOFF, ADDC®									
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)									
LEDs										
System	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M
Serial	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics										
Housing	SECC sheet metal (1 mm)									
Weight	2600 g	2600 g	2600 g	2600 g	2600 g	2600 g	2600 g	2600 g	2940 g	2940 g
Dimensions	440 x 45 x 198 mm								440 x 45 x 228 mm	
Mounting	Standard 19-inch rackmount									
Environmental Limits										
Operating Temperature	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C
Regulatory Approvals										
EMC	CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)									
Safety	UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)									
Green Product	RoHS, CRoHS, WEEE									
Reliability										
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√	√	√
Warranty	5 years (see www.moxa.com/warranty)									

Module/Board Computers

	EM-2260-CE	EM-2260-LX	EM-1240-LX EM-1240-T-LX	EM-1220-LX EM-1220-T-LX
Computer				
CPU Speed	200 MHz	200 MHz	192 MHz	192 MHz
OS (pre-installed)	WinCE 6.0	Linux	Embedded µClinux	
DRAM	128 MB	128 MB	16 MB	16 MB
Flash	32 MB	32 MB	8 MB	8 MB
Digital I/O	8 DIs, 8 DOs	8 DIs, 8 DOs	---	---
Storage				
SD Slot	---	---	√	√
EIDE Interface	√	√	---	---
Display				
Graphics Controller	√	√	---	---
LAN Interface				
10/100 Mbps Ethernet Ports	2	2	2	2
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface				
RS-232/422/485 Ports	4	4	4	2
ESD Protection	15 KV	15 KV	15 KV	15 KV
Console Port	√	√	√	√
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark			
Flow Control	RTS/CTS, XON/XOFF, ADDC®			
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)			
Physical Characteristics				
Weight	70 g	70 g	50 g	40 g
Dimensions	106 x 87 mm	106 x 87 mm	90 x 80 mm	80 x 50 mm
Module Interface	---	---	Two 2 x 28 pin-headers (1.27 x 1.27 mm pitch)	
Environmental Limits				
Operating Temperature	-10 to 60°C	-10 to 60°C	-10 to 60°C or -40 to 75°C	
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C or -40 to 85°C	
Regulatory Approvals				
EMC	CE (Class A), FCC		CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)	
Green Product	RoHS, CRoHS, WEEE			
Reliability				
Buzzer, RTC, WDT	√	√	√	√
Warranty	5 years (see www.moxa.com/warranty)			

V462 Series

x86-based computers with 4 serial ports, dual LANs, VGA, CompactFlash, PCMCIA, USB

- AMD Geode LX 800@0.9W CPU, 500 MHz
- Built-in 256 MB (CE) or 512 MB (XPe) DDR SDRAM
- Built-in 256 MB (CE) or 1 GB (XPe) industrial DOM to store the operating system
- 256 KB of SRAM with battery backup
- 2 RS-232 and 2 RS-232/422/485 serial ports, supporting non-standard baudrates
- Dual 10/100 Mbps Ethernet ports for network redundancy
- CompactFlash socket for storage expansion
- 4 USB 2.0 hosts supporting system boot up
- LED indicators for power, battery, storage
- Ready-to-run WinCE 6.0 or Windows XP Embedded platform
- DIN-rail and wall-mount installation
- -40 to 75°C wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

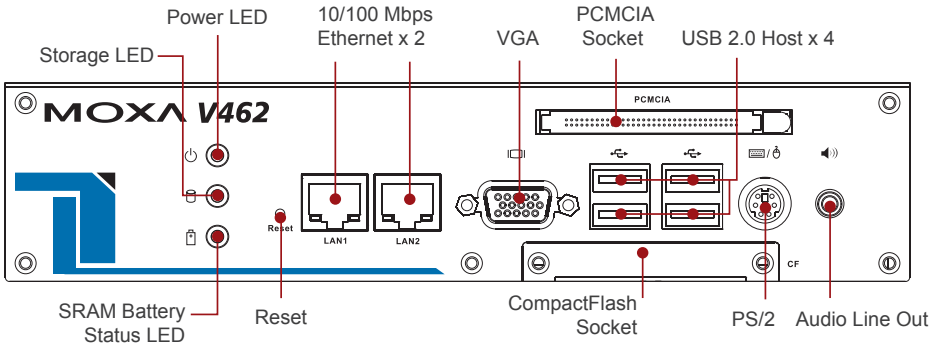
The V462 embedded computers are based on the AMD x86 processor, and feature 4 serial ports, dual LAN ports, 4 USB 2.0 hosts, and CompactFlash and PCMCIA sockets. A VGA interface is also included, making the V462 computers particularly well-suited for industrial applications such as SCADA and factory automation.

The V464 computers' 4 serial ports can be used to connect a wide range of serial devices, and the dual 10/100 Mbps Ethernet ports offer a reliable solution for network redundancy, promising continuous operation for data communication and management. In addition, the CompactFlash, PCMCIA, and USB sockets provide the V462 computers with the reliability needed for industrial applications that require data buffering and storage expansion.

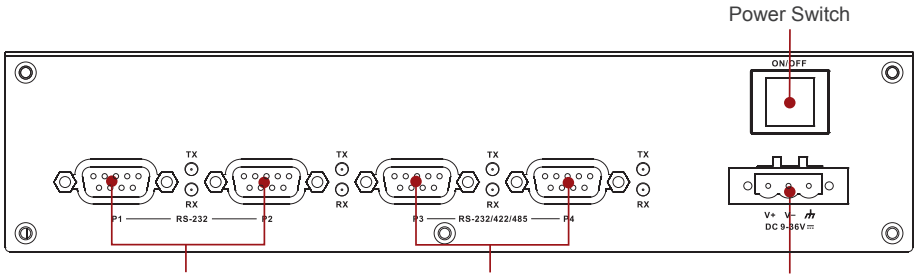
The V462 computers come with the WinCE 6.0 or WinXP Embedded operating system already installed. WinCE 6.0 and WinXP Embedded provide programmers with a friendly environment for developing sophisticated, bug-free application software at a lower cost.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU: AMD Geode LX 800@0.9W processor, 128K L2 Cache, 500 MHz

OS (pre-installed): Windows CE 6.0 or Windows XP Embedded

System Chipset: AMD CS5536

BIOS: 4 mega-bit Flash BIOS, supporting Plug & Play, APM 1.2, ACPI 1.0

SRAM: 256 KB, battery backup

FSB: 400 MHz

System Memory: 200-pin SO-DIMM socket with built-in 256 MB (CE) or 512 MB (XPe) DDR, supporting DDR400 up to 1 GB

PCMCIA: Cardbus card and 16-bit PCMCIA 2.1/JEIDA 4.2 card

Expansion Bus: PC/104-Plus onboard

USB: USB 2.0 compliant hosts x 4, type A connector, supporting system boot up

Storage

Built-in: 256 MB (CE) or 1 GB (XPe) industrial DOM for OS

Storage Expansion: CompactFlash socket

Other Peripherals

KB/MS: 1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable

Audio: AC97 audio, with speaker-out interface

Display

Graphics Controller: CPU integrated 2D graphics

Display Interface: CRT interface for VGA output

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)

Controller: Realtek RTL8100CL

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards:
- 2 RS-232 ports (DB9 male)
- 2 RS-232/422/485 ports, software selectable (DB9 male)

ESD protection: 15 KV for all signals

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

LEDs

System: Power, Battery, Storage

LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Switches and Buttons

Power Switch: on/off

Reset Button: For warm reboot

Physical Characteristics

Housing: Aluminum, EPIC form factor

Weight: 1.32 kg

Dimensions: 223 x 120.5 x 57 mm (8.78 x 4.74 x 2.24 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -20 to 75°C (-4 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Anti-vibration: 5 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 50 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 9 to 36 VDC (3-pin terminal block for V+, V-, SG)

Power Consumption: 26 W
- 730 mA @ 36 VDC
- 1080 mA @ 24 VDC
- 2820 mA @ 9 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD, CCC (GB4943)

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock) with battery backup

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

File Server: Enables clients to access files and other resources over the network (Microsoft® Wincows® CE).

Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

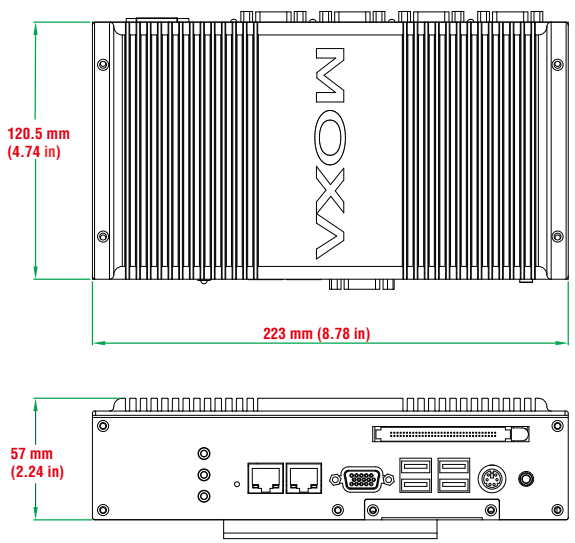
Dial-up Networking Service: RAS client API and PPP, supporting Extensible Authentication Protocol (EAP) and RAS scripting.

Watchdog Service: CPU Hardware function to reset CPU in a user specified time interval (triggered by calling a MOXA library function).

Application Development Software:

- Moxa WinCE 6.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0 SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Dimensions



Windows XP Embedded

System Utilities: Windows command shell, Telnet, ftp, web-based administration manager, Wireless Zero Configuration

File System: NTFS

Protocol Stack: DHCP, IPv4, DNS, IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, SNTP, FTP, SMTP, PPPoE, PPTP, NetBIOS

Telnet Server: Allows users to connect to Telnet servers from remote computers.

IIS Web Server: Allows you to create and manage Web sites.

Terminal Server: Microsoft Terminal Server client application (mstsc.exe).

COM+ Services: The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).

Computer Browser Service: Computer browsing functionality exposed by Windows through Microsoft Networking. Allows a client machine to browse its network neighborhood for available computers exposing file and print sharing services.

Disk Management Services: Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other changes in the storage subsystem.

Remote Registry Service: Enables remote users to modify registry settings on this computer.

Application Development Software:

- Microsoft .Net Framework 2.0 with service pack 2 (CLR and the .NET Framework class library)
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL),ASP.NET 2.0
- Certificate Request Client & Certificate Autoenrollment (CLR and the .NET Framework class library)
- COM APIs
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow and Direct show filters
- Distributed Transaction Coordinator (MSDTC)
- Enhanced Write Filter (Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage)
- Event Log, Internet Explorer
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- Registry Editor
- RPC
- Smart Card Cryptographic Service Providers
- USB 2.0 core drivers compliant with The USB .95 or 1.0
- Windows API, Media Player 10, Script Engines, and WMI

Ordering Information

Available Models

V462-CE: x86 embedded computer with 4 serial ports, dual LANs, VGA, CompactFlash, PCMCIA, USB, and WinCE 6.0 OS, -10 to 60°C operating temperature

V462-XPE: x86 embedded computer with 4 serial ports, dual LANs, VGA, CompactFlash, PCMCIA, USB, and Windows XP Embedded OS, -10 to 60°C operating temperature

V462-T-CE: x86 embedded computer with 4 serial ports, dual LANs, VGA, CompactFlash, PCMCIA, USB, and WinCE 6.0 OS, -20 to 75°C operating temperature

V462-T-XPE: x86 embedded computer with 4 serial ports, dual LANs, VGA, CompactFlash, PCMCIA, USB, and Windows XP Embedded OS, -20 to 75°C operating temperature

Package Checklist

- V462 embedded computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- DIN-rail Mounting Kit
- PS2 to KB/MS Y-type Cable
- Document and Software CD or DVD
- Quick Installation Guide (printed)
- Warranty Card

V464 Series

x86-based computers with 4 serial ports, quad LANs, VGA, CompactFlash, USB

- AMD Geode LX 800@0.9W CPU, 500 MHz
- Built-in 256 MB (CE) or 512 MB (XPe) DDR SDRAM
- Built-in 256 MB (CE) or 1 GB (XPe) industrial DOM to store the operating system
- 256 KB of SRAM with battery backup
- 2 RS-232 and 2 RS-232/422/485 serial ports, supporting non-standard baudrates
- Quad 10/100 Mbps Ethernet ports for network redundancy
- CompactFlash socket for storage expansion
- 4 USB 2.0 hosts supporting system boot up
- LED indicators for power, battery, storage
- Ready-to-run WinCE 6.0 or Windows XP Embedded platform
- DIN-rail and wall-mount installation
- Robust, fan-less design
- -40 to 75°C wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

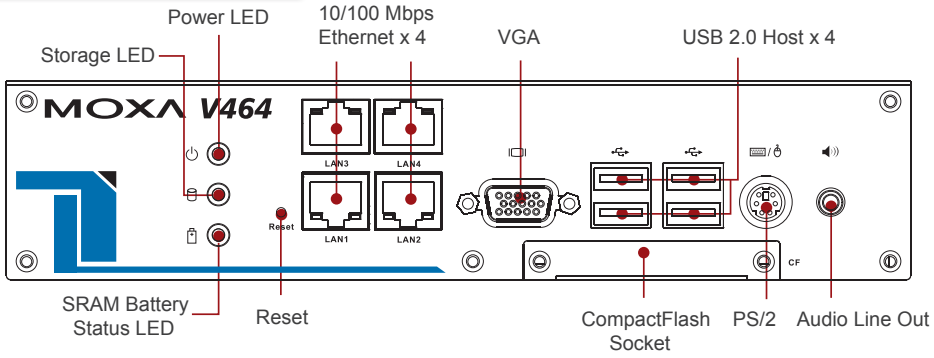
The V464 embedded computers are based on the AMD x86 processor, and feature 4 serial ports, quad LAN ports, 4 USB 2.0 hosts, and CompactFlash. A VGA interface is included, making the V464 computers particularly well-suited for industrial applications such as SCADA and factory automation.

The V464 computers' 4 serial ports make them ideal for connecting a wide range of serial devices, and the quad 10/100 Mbps Ethernet ports offer a reliable solution for network redundancy, promising continuous operation for data communication and management. In addition, the CompactFlash and USB sockets provide the V464 computers with the reliability needed for industrial applications that require data buffering and storage expansion.

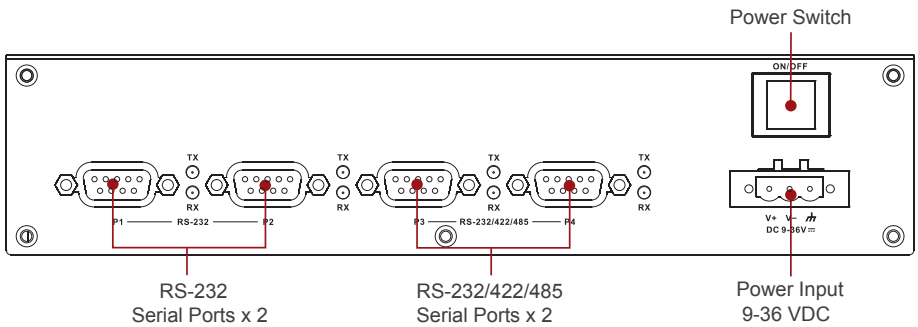
The V464 computers come with either the WinCE 6.0 or WinXP Embedded operating system already installed. WinCE 6.0 and WinXP Embedded provide programmers with a friendly environment for developing sophisticated, bug-free application software at a lower cost.

Appearance

Front View



Rear view



Hardware Specifications

Computer

CPU: AMD Geode LX 800@0.9W processor, 128K L2 Cache, 500 MHz

OS (pre-installed): Windows CE 6.0 or Windows XP Embedded

System Chipset: AMD CS5536

BIOS: 4 mega-bit Flash BIOS, supporting Plug & Play, APM 1.2, ACPI 1.0

SRAM: 256 KB, battery backup

FSB: 400 MHz

System Memory: 200-pin SO-DIMM socket with built-in 256 MB (CE) or 512 MB (XPe) DDR, supporting DDR400 up to 1 GB

Expansion Bus: PC/104-Plus onboard

USB: USB 2.0 compliant hosts x 4, type A connector, supports system boot up

Storage

Built-in: 256 MB (CE) or 1 GB (XPe) industrial DOM for OS

Storage Expansion: CompactFlash socket

Other Peripherals

KB/MS: 1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable

Audio: AC97 audio, with speaker-out interface

Display

Graphics Controller: CPU integrated 2D graphics

Display Interface: CRT interface for VGA output

Ethernet Interface

LAN: 4 auto-sensing 10/100 Mbps ports (RJ45)

Controller: Realtek RTL8100CL

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards:
- 2 RS-232 ports (DB9 male)
- 2 RS-232/422/485 ports, software selectable (DB9 male)

ESD protection: 15 KV for all signals

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

LEDs

System: Power, Battery, Storage

LAN: 10M/Link x 4, 100M/Link x 4 (on connector)

Switches and Buttons

Power Switch: on/off

Reset Button: For warm reboot

Physical Characteristics

Housing: Aluminum, EPIC form factor

Weight: 1.32 kg

Dimensions: 223 x 120.5 x 57 mm (8.78 x 4.74 x 2.24 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -20 to 75°C (-4 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Anti-vibration: 5 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 50 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 9 to 36 VDC (3-pin terminal block for V+, V-, SG)

Power Consumption: 26 W
- 730 mA @ 36 VDC
- 1080 mA @ 24 VDC
- 2820 mA @ 9 VDC)

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD, CCC (GB4943)

Green Product: RoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock) with battery backup

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

File Server: Enables clients to access files and other resources over the network (Microsoft® Wincows® CE)

Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

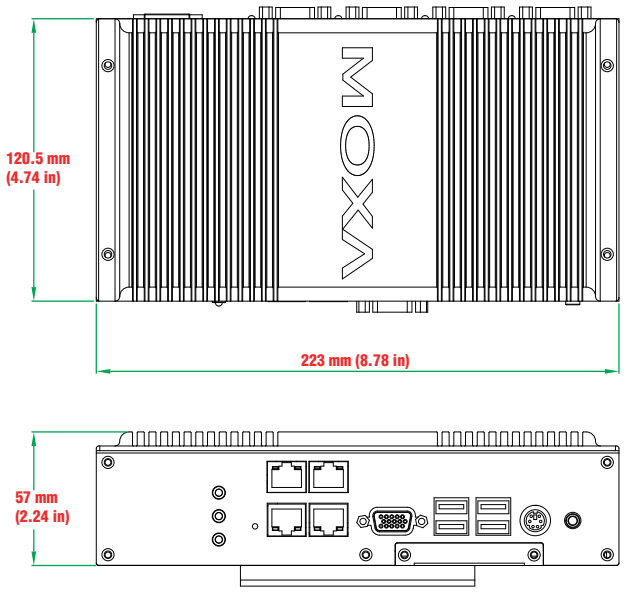
Dial-up Networking Service: RAS client API and PPP, supporting Extensible Authentication Protocol (EAP) and RAS scripting.

Watchdog Service: CPU Hardware function to reset CPU in a user specified time interval (triggered by calling a MOXA library function)

Application Development Software:

- Moxa WinCE 6.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0 SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Dimensions



Windows XP Embedded

System Utilities: Windows command shell, Telnet, ftp, web-based administration manager, Wireless Zero Configuration

File System: NTFS

Protocol Stack: DHCP, IPv4, DNS, IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, SNTP, FTP, SMTP, PPPoE, PPTP, NetBIOS

Telnet Server: Allows users to connect to Telnet servers from remote computers.

IIS Web Server: Allows you to create and manage Web sites.

Terminal Server: Microsoft Terminal Server client application (mstsc.exe).

COM+ Services: The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).

Computer Browser Service: Computer browsing functionality exposed by Windows through Microsoft Networking. It allows a client machine to browse its network neighborhood for available computers exposing file and print sharing services.

Disk Management Services: Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other changes in the storage subsystem.

Remote Registry Service: Enables remote users to modify registry settings on this computer.

Application Development Software:

- Microsoft .Net Framework 2.0 with service pack 2 (CLR and the .NET Framework class library)
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL),ASP.NET 2.0
- Certificate Request Client & Certificate Autoenrollment (CLR and the .NET Framework class library)
- COM APIs
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow and Direct show filters
- Distributed Transaction Coordinator (MSDTC)
- Enhanced Write Filter (Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage)
- Event Log, Internet Explorer
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- Registry Editor
- RPC
- Smart Card Cryptographic Service Providers
- USB 2.0 core drivers compliant with The USB .95 or 1.0
- Windows API, Media Player 10, Script Engines, and WMI

Ordering Information

Available Models

V464-CE: x86 embedded computer with 4 serial ports, quad LANs, VGA, CompactFlash, USB, and WinCE 6.0 OS, -10 to 60°C operating temperature

V464-XPE: x86 embedded computer with 4 serial ports, quad LANs, VGA, CompactFlash, USB, and Windows XP Embedded OS, -10 to 60°C operating temperature

V464-T-CE: x86 embedded computer with 4 serial ports, quad LANs, VGA, CompactFlash, USB, and WinCE 6.0 OS, -20 to 75°C operating temperature

V464-T-XPE: x86 embedded computer with 4 serial ports, quad LANs, VGA, CompactFlash, USB, and Windows XP Embedded OS, -20 to 75°C operating temperature

Package Checklist

- V464 embedded computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- DIN-rail Mounting Kit
- PS2 to KB/MS Y-type Cable
- Document and Software CD or DVD
- Quick Installation Guide (printed)
- Warranty Card

V466 Series

x86-based computers with 4 serial ports, quad LANs, VGA, CompactFlash, built-in 8-port Ethernet switch, USB

- AMD Geode LX 800@0.9W CPU, 500 MHz
- Built-in 256 MB (CE) or 512 MB (XPe) DDR SDRAM
- Built-in 256 MB (CE) or 1 GB (XPe) industrial DOM to store the operating system
- 256 KB battery backup SRAM
- 2 RS-232 and 2 RS-232/422/485 serial ports, supporting non-standard baudrates
- Quad 10/100 Mbps Ethernet ports for network redundancy
- Built-in 8-port Ethernet switch for connecting network devices
- CompactFlash socket for storage expansion
- 4 USB 2.0 hosts supporting system boot up
- LED indicators for power, battery, storage
- Ready-to-run WinCE 6.0 or Windows XP Embedded platform
- DIN-rail and wall-mount installation
- Robust, fan-less design
- -40 to 75°C wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

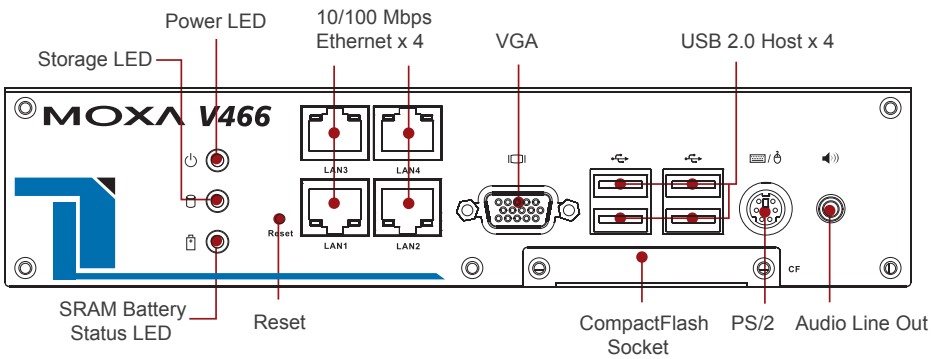
The V466 embedded computers are based on the AMD x86 processor, and feature 4 serial ports, quad LAN ports, 4 USB 2.0 hosts, and CompactFlash. A VGA interface is included to make the V466 computers particularly well-suited for industrial applications, such as SCADA and factory automation.

The V466 computers' 4 serial ports make them ideal for connecting a wide range of serial devices, and the quad 10/100 Mbps Ethernet ports offer a reliable solution for network redundancy, promising continuous operation for data communication and management. As an added convenience, the V466 computers have 8 built-in 10/100 Mbps Ethernet switch ports for connecting network devices. In addition, the CompactFlash and USB sockets provide the V466 computers with the reliability needed for industrial applications that require data buffering and storage expansion.

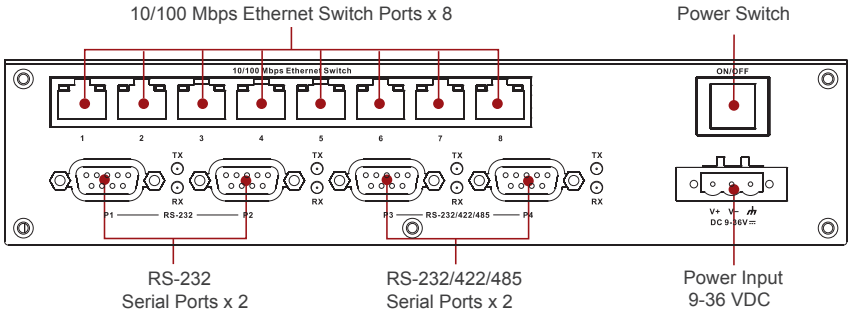
The V466 computers comes with the WinCE 6.0 or WinXP Embedded operating system already installed. WinCE 6.0 or WinXP Embedded provides programmers with a friendly environment for developing sophisticated, bug-free application software at a lower cost.

Appearance

Front View



Rear view



Hardware Specifications

Computer

CPU: AMD Geode LX 800@0.9W processor with 128K L2 Cache, 500 MHz

OS (pre-installed): Windows CE 6.0 or Windows XP Embedded

System Chipset: AMD CS5536

BIOS: 4 mega-bit Flash BIOS, supporting Plug & Play, APM 1.2, ACPI 1.0

SRAM: 256 KB, battery backup

FSB: 400 MHz

System Memory: 200-pin SO-DIMM socket with built-in 256 MB (CE) or 512 MB (XPe) DDR, supporting DDR400 up to 1 GB

Expansion Bus: PC/104-Plus onboard

USB: USB 2.0 compliant hosts x 4, type A connector, supports system boot up

Storage

Built-in: 256 MB (CE) or 1 GB (XPe) industrial DOM for OS

Storage Expansion: CompactFlash socket

Other Peripherals

KB/MS: 1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable

Audio: AC97 audio, with speaker-out interface

Display

Graphics Controller: CPU integrated 2D graphics

Display Interface: CRT interface for VGA output

Ethernet Interface

LAN: 4 auto-sensing 10/100 Mbps ports (RJ45)

Switch Ports: Built-in 8-port Ethernet switch (10/100 Mbps, unmanaged)

Controller: Realtek RTL8100CL

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards:
- 2 RS-232 ports (DB9 male)
- 2 RS-232/422/485 ports, software selectable (DB9 male)

ESD protection: 15 KV for all signals

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manuals for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

LEDs

System: Power, Battery, Storage

LAN: 10M/Link x 4, 100M/Link x 4 (on connector), Switch x 8

Switches and Buttons

Power Switch: on/off

Reset Button: For warm reboot

Physical Characteristics

Housing: Aluminum, EPIC form factor

Weight: 1.32 kg

Dimensions:
Without ears: 223 x 120.5 x 57 mm (8.78 x 4.74 x 2.24 in)
With ears: 253 x 120.5 x 57 (9.96 x 4.74 x 2.24 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -20 to 75°C (-4 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Anti-vibration: 5 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 50 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 9 to 36 VDC (3-pin terminal block for V+, V-, SG)

Power Consumption: 26 W
- 730 mA @ 36 VDC
- 1080 mA @ 24 VDC
- 2820 mA @ 9 VDC)

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD, CCC (GB4943)

Green Product: RoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock) with battery backup

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

File Server: Enables clients to access files and other resources over the network (Microsoft® Wincows® CE)

Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

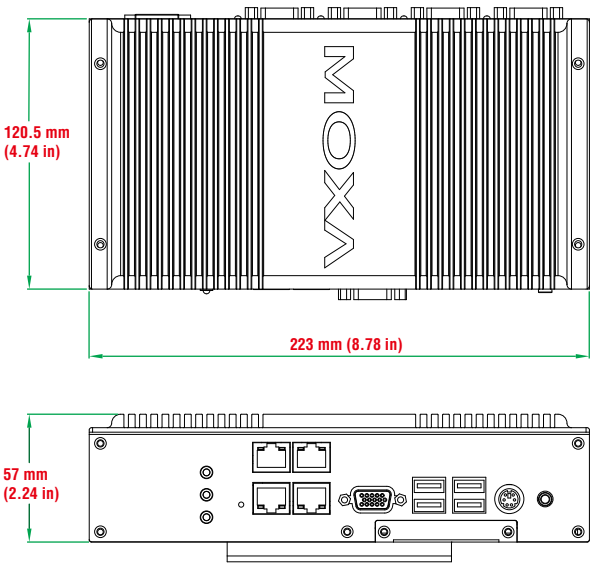
Dial-up Networking Service: RAS client API and PPP, supporting Extensible Authentication Protocol (EAP) and RAS scripting.

Watchdog Service: CPU Hardware function to reset CPU in a user specified time interval (triggered by calling a MOXA library function)

Application Development Software:

- Moxa WinCE 6.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0 SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Dimensions



Windows XP Embedded

System Utilities: Windows command shell, Telnet, ftp, web-based administration manager, Wireless Zero Configuration

File System: NTFS

Protocol Stack: DHCP, IPv4, DNS, IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, SNTP, FTP, SMTP, PPPoE, PPTP, NetBIOS

Telnet Server: Allows users to connect to Telnet servers from remote computers.

IIS Web Server: Allows you to create and manage Web sites.

Terminal Server: Microsoft Terminal Server client application (mstsc.exe).

COM+ Services: The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).

Computer Browser Service: Computer browsing functionality exposed by Windows through Microsoft Networking. It allows a client machine to browse its network neighborhood for available computers exposing file and print sharing services.

Disk Management Services: Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other changes in the storage subsystem.

Remote Registry Service: Enables remote users to modify registry settings on this computer.

Application Development Software:

- Microsoft .Net Framework 2.0 with service pack 2 (CLR and the .NET Framework class library)
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL),ASP.NET 2.0
- Certificate Request Client & Certificate Autoenrollment (CLR and the .NET Framework class library)
- COM APIs
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow and Direct show filters
- Distributed Transaction Coordinator (MSDTC)
- Enhanced Write Filter (Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage)
- Event Log, Internet Explorer
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- Registry Editor
- RPC
- Smart Card Cryptographic Service Providers
- USB 2.0 core drivers compliant with USB .95 or 1.0
- Windows API, Media Player 10, Script Engines, and WMI

Ordering Information

Available Models

V466-CE: x86 embedded computer with 4 serial ports, quad LANs, 8-port Ethernet switch, VGA, CompactFlash, USB, and WinCE 6.0 OS, -10 to 60°C operating temperature

V466-XPE: x86 embedded computer with 4 serial ports, quad LANs, 8-port Ethernet switch, VGA, CompactFlash, USB, and Windows XP Embedded OS, -10 to 60°C operating temperature

V466-T-CE: x86 embedded computer with 4 serial ports, quad LANs, 8-port Ethernet switch, VGA, CompactFlash, USB, and WinCE 6.0 OS, -20 to 75°C operating temperature

V466-T-XPE: x86 embedded computer with 4 serial ports, quad LANs, 8-port Ethernet switch, VGA, CompactFlash, USB, and Windows XP Embedded OS, -20 to 75°C operating temperature

Package Checklist

- V466 embedded computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- DIN-rail Mounting Kit
- PS2 to KB/MS Y-type Cable
- Document and Software CD or DVD
- Quick Installation Guide (printed)
- Warranty Card

V468 Series

x86-based computers with 4 serial ports, quad LANs, VGA, 8 DI, 8 DO, CompactFlash, USB

- AMD Geode LX 800@0.9W CPU, 500 MHz
- Built-in 256 MB (CE) or 512 MB (XPe) DDR SDRAM
- Built-in 256 MB (CE) or 1 GB (XPe) industrial DOM to store the operating system
- 256 KB battery backup SRAM
- 2 RS-232 and 2 RS-232/422/485 serial ports, supporting non-standard baudrates
- Quad 10/100 Mbps Ethernet ports for network redundancy
- 8 DI and 8 DO interfaces for digital input/output connections, with 3 KV isolation protection
- CompactFlash socket for storage expansion
- 4 USB 2.0 hosts supporting system boot up
- LED indicators for power, battery, storage
- Ready-to-run WinCE 6.0 or Windows XP Embedded platform
- DIN-rail and wall-mount installation
- Robust, fan-less design
- -40 to 75°C wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

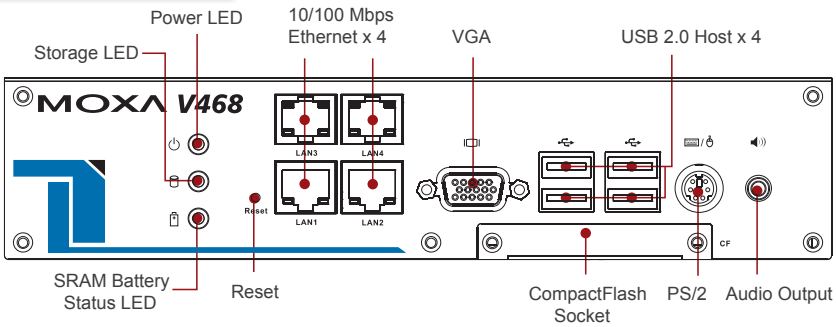
The V468 embedded computers are based on the AMD x86 processor, and feature 4 serial ports, quad LAN ports, 4 USB 2.0 hosts, and CompactFlash. A VGA interface is included to make the V468 computers particularly well-suited for industrial applications, such as SCADA and factory automation.

The V468 computers' 4 serial ports make them ideal for connecting a wide range of serial devices, and the quad 10/100 Mbps Ethernet ports offer a reliable solution for network redundancy, promising continuous operation for data communication and management. As an added convenience, the V468 computers have 8 DIs and 8 DOs for connecting digital input/output devices. In addition, the CompactFlash and USB sockets provide the V468 computers with the reliability needed for industrial applications that require data buffering and storage expansion.

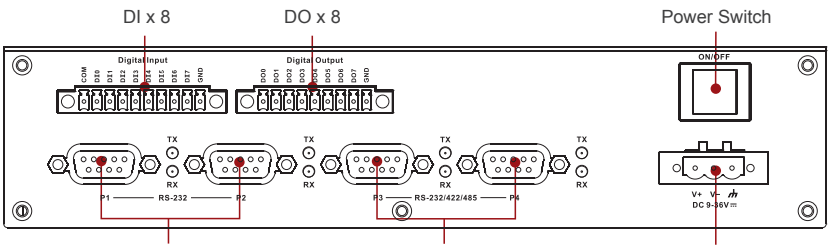
The V468 computers come with the WinCE 6.0 or WinXP Embedded operating system already installed. WinCE 6.0 or WinXP Embedded provides programmers with a friendly environment for developing sophisticated, bug-free application software at a lower cost.

Appearance

Front View



Rear view



Hardware Specifications

Computer

CPU: AMD Geode LX 800@0.9W processor with 128K L2 Cache, 500 MHz

OS (pre-installed): Windows CE 6.0 or Windows XP Embedded

System Chipset: AMD CS5536

BIOS: 4 mega-bit Flash BIOS, supporting Plug & Play, APM 1.2, ACPI 1.0

SRAM: 256 KB, battery backup

FSB: 400 MHz

System Memory: 200-pin SO-DIMM socket with built-in 256 MB (CE) or 512 MB (XPe) DDR, supporting DDR400 up to 1 GB

Expansion Bus: PC/104-Plus onboard

USB: USB 2.0 compliant hosts x 4, type A connector, supports system boot up

Storage

Built-in: 256 MB (CE) or 1 GB (XPe) industrial DOM for OS

Storage Expansion: CompactFlash socket

Other Peripherals

KB/MS: 1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable

Audio: AC97 audio, with speaker-out interface

Display

Graphics Controller: CPU integrated 2D graphics

Display Interface: CRT interface for VGA output

Ethernet Interface

LAN: 4 auto-sensing 10/100 Mbps ports (RJ45)

Controller: Realtek RTL8100CL

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards:
- 2 RS-232 ports (DB9 male)
- 2 RS-232/422/485 ports, software selectable (DB9 male)

ESD protection: 15 KV for all signals

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

Digital Input

Input Channels: 8, source type

Input Voltage: 0 to 30 VDC at 5 KHz

Digital Input Levels for Dry Contacts:
- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:
- Logic level 0: +3V max.
- Logic level 1: +10 V to +30 V (COM to DI)

Connector Type: 10-pin screw terminal block (8 points, COM, GND)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 8, sink type

Output Current: Max. 200 mA per channel

Output Voltage:
- Logic 0: 0-0.55 V
- Logic 1: 2.5-3.3 V

On-state Voltage: 24 VDC nominal, open collector to 30 V

Connector Type: 9-pin screw terminal block

Isolation: 3 KV optical isolation

LEDs

System: Power, Battery, Storage

LAN: 10M/Link x 4, 100M/Link x 4 (on connector)

Switches and Buttons

Power Switch: on/off

Reset Button: For warm reboot

Physical Characteristics

Housing: Aluminum, EPIC form factor

Weight: 1.32 kg

Dimensions:
Without ears: 223 x 120.5 x 57 mm (8.78 x 4.74 x 2.24 in)
With ears: 248 x 140 x 70 mm (9.76 x 5.51 x 2.76 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -20 to 75°C (-4 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Anti-vibration: 5 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 50 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 9 to 36 VDC (3-pin terminal block for V+, V-, SG)

Power Consumption: 26 W
- 730 mA @ 36 VDC
- 1080 mA @ 24 VDC
- 2820 mA @ 9 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD, CCC (GB4943)

Green Product: RoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock) with battery backup

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

File Server: Enables clients to access files and other resources over the network (Microsoft® Wincows® CE)

Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

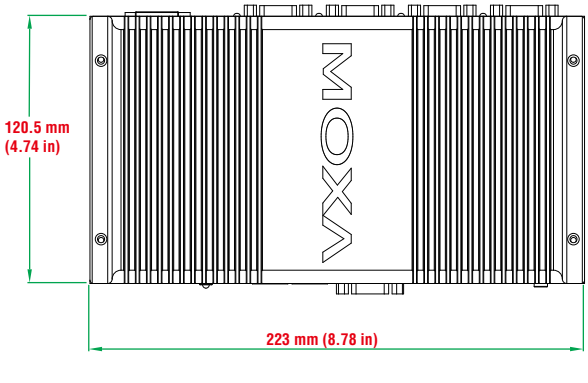
Dial-up Networking Service: RAS client API and PPP, supporting Extensible Authentication Protocol (EAP) and RAS scripting.

Watchdog Service: CPU Hardware function to reset CPU in a user specified time interval (triggered by calling a MOXA library function)

Application Development Software:

- Moxa WinCE 6.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0 SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Dimensions



Windows XP Embedded

System Utilities: Windows command shell, Telnet, ftp, web-based administration manager, Wireless Zero Configuration

File System: NTFS

Protocol Stack: DHCP, IPv4, DNS, IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, SNTP, FTP, SMTP, PPPoE, PPTP, NetBIOS

Telnet Server: Allows users to connect to Telnet servers from remote computers.

IIS Web Server: Allows you to create and manage Web sites.

Terminal Server: Microsoft Terminal Server client application (mstsc.exe).

COM+ Services: The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).

Computer Browser Service: Computer browsing functionality exposed by Windows through Microsoft Networking. It allows a client machine to browse its network neighborhood for available computers exposing file and print sharing services.

Disk Management Services: Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other changes in the storage subsystem.

Remote Registry Service: Enables remote users to modify registry settings on this computer.

Application Development Software:

- Microsoft .Net Framework 2.0 with service pack 2 (CLR and the .NET Framework class library)
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL),ASP.NET 2.0
- Certificate Request Client & Certificate Autoenrollment (CLR and the .NET Framework class library)
- COM APIs
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow and Direct show filters
- Distributed Transaction Coordinator (MSDTC)
- Enhanced Write Filter (Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage)
- Event Log, Internet Explorer
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- Registry Editor
- RPC
- Smart Card Cryptographic Service Providers
- USB 2.0 core drivers compliant with USB .95 or 1.0
- Windows API, Media Player 10, Script Engines, and WMI

Ordering Information

Available Models

V468-CE: x86 embedded computer with 4 serial ports, quad LANs, VGA, 8 DI, 8 DO, CompactFlash, USB, and WinCE 6.0 OS, -10 to 60°C operating temperature

V468-XPE: x86 embedded computer with 4 serial ports, quad LANs, VGA, 8 DI, 8 DO, CompactFlash, USB, and Windows XP Embedded OS, -10 to 60°C operating temperature

V468-T-CE: x86 embedded computer with 4 serial ports, quad LANs, VGA, 8 DI, 8 DO, CompactFlash, USB, and WinCE 6.0 OS, -20 to 75°C operating temperature

V468-T-XPE: x86 embedded computer with 4 serial ports, quad LANs, VGA, 8 DI, 8 DO, CompactFlash, USB, and Windows XP Embedded OS, -20 to 75°C operating temperature

Package Checklist

- V468 embedded computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- DIN-rail Mounting Kit
- PS2 to KB/MS Y-type Cable
- Document and Software CD or DVD
- Quick Installation Guide (printed)
- Warranty Card

V481 Series

x86-based computer with 8 serial ports, dual LANs, VGA, CompactFlash, USB, audio

- Intel Celeron M 1 GHz CPU, 400 MHz FSB
- 256 MB (CE) or 512 MB (XPe) DDR SDRAM, 256 MB (CE) or 1 GB (XPe) industrial CompactFlash built in
- 8 software-selectable RS-232/422/485 serial ports
- Serial port speed from 50 bps to 921.6 Kbps, supporting non-standard baudrates
- 10/100 Mbps and 10/100/1000 Mbps LANs for network redundancy
- Supports 2nd CompactFlash socket for storage expansion
- 2 USB 2.0 hosts that support system bootup
- LED indicators for system power and storage
- Designed to withstand 5g's of continuous vibration and 50g shocks
- Ready-to-run WinCE 5.0 or Windows XP Embedded platform
- DIN-rail or wall-mount installation
- Robust, fanless design
- Wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

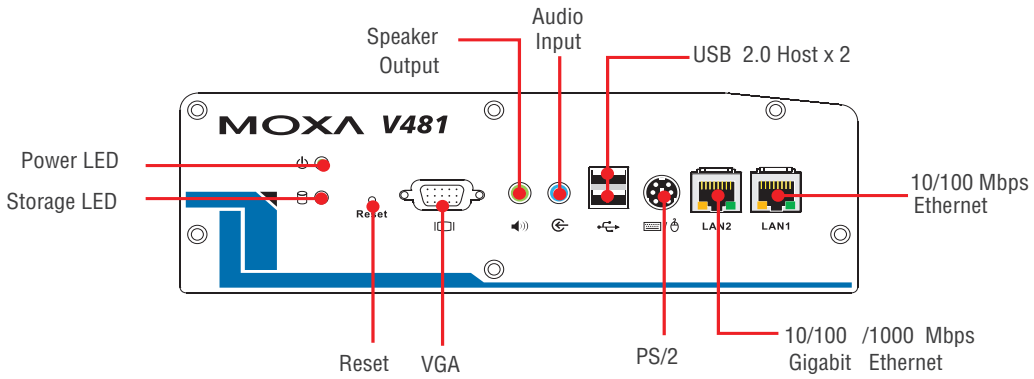
The V481 ready-to-run embedded computers are based on the Intel x86 processor, and come with VGA interface, dual LANs, 8 serial ports, CompactFlash, USB, and audio. The VGA interface was included to make this computer particularly well-suited for industrial applications, such as SCADA and factory automation.

The V481 computers come with 8 software-selectable RS-232/422/485 serial ports built in, making them ideal for connecting a wide range of serial devices. The 10/100 Mbps and 10/100/1000 Mbps LAN ports offer a reliable solution for network redundancy, promising continuous operation for data communication and management. In addition, the second CompactFlash socket makes storage expansion easier, and the USB slots can be used to connect different types of devices, making the V481 a reliable embedded computer for industrial applications that require VGA and HMI features.

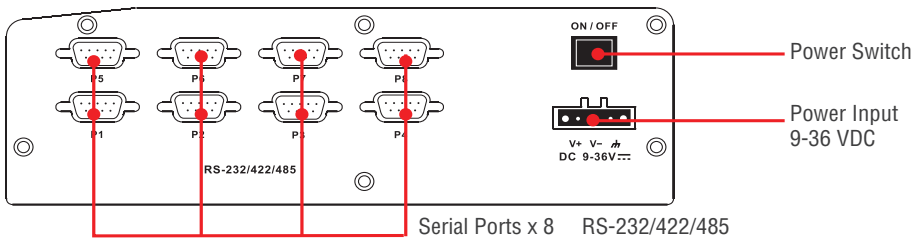
The V481 comes with the Windows CE 5.0 or Windows XP Embedded operating system pre-installed, providing a friendly environment for programmers to develop sophisticated application software. The great software support that Moxa provides makes the programmer's job easier, and makes it possible to develop bug-free code quickly and at a lower cost. In addition, the wide operating temperature model, which works in temperatures ranging from -35 to 75°C, provides users with a great solution for any harsh environment.

Appearance

Front View



Rear view



Hardware Specifications

Computer

CPU: Intel ULV Celeron M 1 GHz processor

OS (pre-installed): Windows CE 5.0 or Windows XP Embedded

System Chipset: Intel 852GM GMCH +ICH4

BIOS: 4 mega-bit Flash BIOS, supporting Plug & Play

FSB: 400 MHz

System Memory: 200-pin SO-DIMM socket with built-in 256 MB (CE) or 512 MB (XPe) DDR, supporting DDR200/266 up to 1 GB

Expansion Bus: PC/104-Plus onboard

USB: USB 2.0 compliant hosts x 2, type A connector, supports system boot up

Storage

Built-in: 256 MB (CE) or 1 GB (XPe) industrial CompactFlash card onboard to store OS

Storage Expansion: CompactFlash socket

Other Peripherals

KB/MS: 1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable

Audio: AC97 audio, with speaker-out interface

Display

Graphics Controller: Integrated graphics with built-in Intel 852GM GMCH and Intel extreme Graphics 2 technology

Display Memory: Dynamic video memory for up to 32 MB of system memory

Display Interface: CRT

Ethernet Interface

LAN: 2 independent LAN ports (RJ45)
- LAN1: Auto-sensing 10/100 Mbps Ethernet, using integrated MAC and Intel 82562GZ transceiver
- LAN2: Auto-sensing 10/100/1000 Mbps Gigabit Ethernet, using Realtek RTL8110SC controller

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 8 RS-232/422/485 ports, software selectable (DB9 male)

ESD protection: 15 KV for all signals

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

LEDs

System: Power, Storage

LAN1: Act/Link and 10/100 Mbps mode (on connector)

LAN2: Act/Link and 10/100/1000 Mbps mode (on connector)

Switches and Buttons

Power Switch: on/off

Reset Button: For warm reboot

Physical Characteristics

Housing: Aluminum

Weight: 2.2 kg

Dimensions:
Without ears: 225 x 140 x 70 mm (8.86 x 5.51 x 2.76 in)
With ears: 248 X 140 X 70 mm (9.76 X 5.51 X 2.76 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -35 to 75°C (-31 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Anti-vibration:
- With CF card: 5 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis
- With hard disk: 1 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1hr per axis

Anti-Shock:
- With CF card: 50 g @ IEC-68-2-27, half sine wave, 11 ms
- With hard disk: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 9 to 36 VDC

Power Consumption: 24 W
- 650 mA @ 36 VDC
- 1000 mA @ 24 VDC
- 2750 mA @ 9 VDC)

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)

Green Product: RoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock) with battery backup

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Windows Embedded CE 5.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

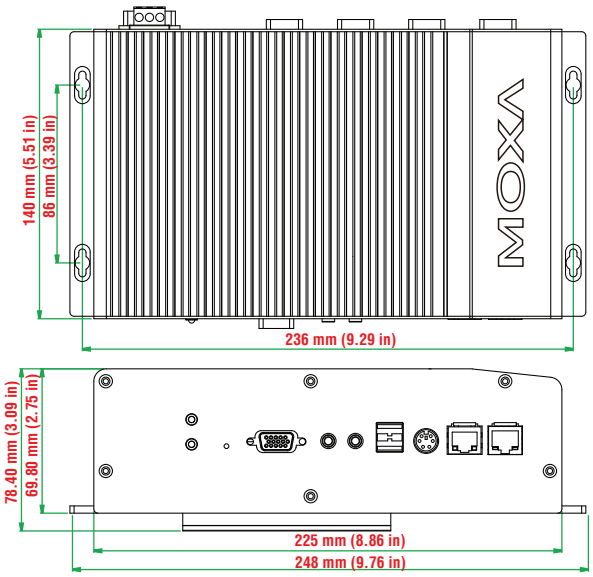
FTP Server: Used for transferring files to and from remote computer systems over a network.

Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

Dial-up Networking Service: RAS client API and PPP, supporting Extensible Authentication Protocol (EAP) and RAS scripting.

Application Development Environment:
- Moxa WinCE 5.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0 SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit, Winsock 2.2, SQL Mobile

Dimensions



Windows XP Embedded

System Utilities: Windows command shell, Telnet, ftp, web-based administration manager, Wireless Zero Configuration

File System: NTFS

Protocol Stack: DHCP, IPv4, DNS,IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, SNTP, FTP, SMTP, PPPoE, PPTP, NetBIOS

Telnet Server: Allows users to connect to Telnet servers from remote computers.

IIS Web Server: Allows you to create and manage Web sites.

Terminal Server: Microsoft Terminal Server client application (mstsc.exe).

COM+ Services: The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).

Computer Browser Service: Computer browsing functionality exposed by Windows through Microsoft Networking. Allows a client machine to browse its network neighborhood for available computers, exposing file and print sharing services.

Disk Management Services: Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other changes in the storage subsystem.

Remote Registry Service: Enables remote users to modify registry settings on this computer.

Application Development Software:
- Microsoft .Net Framework 2.0 with service pack 2 (CLR and the .NET Framework class library)
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL),ASP.NET 2.0
- Certificate Request Client & Certificate Autoenrollment (CLR and the .NET Framework class library)
- COM APIs
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow and Direct show filters
- Distributed Transaction Coordinator (MSDTC)
- Enhanced Write Filter (redirects disk write operations to volatile (RAM) or non-volatile (disk) storage)
- Event Log,Internet Explorer
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- Registry Editor
- RPC
- Smart Card Cryptographic Service Providers
- USB 2.0 core drivers compliant with USB .95 or 1.0
- Windows API, Media Player 10, Script Engines, and WMI

Ordering Information

Available Models

V481-CE: x86 embedded computer with VGA, dual LANs, 8 serial ports, CompactFlash, USB, audio, WinCE 5.0, -10 to 60°C operating temperature

V481-XPE: x86 embedded computer with VGA, dual LANs, 8 serial ports, CompactFlash, USB, audio, Win XPE, -10 to 60°C operating temperature

V481-T-CE: x86 embedded computer with VGA, dual LANs, 8 serial ports, Compact Flash, USB, audio, WinCE 5.0, -35 to 75°C operating temperature

V481-T-XPE: x86 embedded computer with VGA, dual LANs, 8 serial ports, CompactFlash, USB, audio, Win XPE, -35 to 75°C operating temperature

Package Checklist

- V481 embedded computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- DIN-rail Mounting Kit
- PS2 to KB/MS Y-type Cable
- Document and Software CD or DVD
- Quick Installation Guide (printed)
- Warranty Card

UC-8410 Series

RISC-based industrial embedded computer with 8 serial ports, 3 LANs, DIO, CompactFlash, USB

- Intel XScale IXP435 533 MHz processor
- 256 MB DDR2 SDRAM and 16 MB Flash ROM onboard
- 16 MB NOR Flash onboard to store OS, 32 MB NAND Flash onboard for data storage
- 256 KB battery backup SRAM
- 8 RS-232/422/485 serial ports
- 4 digital input and 4 digital output channels
- 3 10/100 Mbps Ethernet ports
- 2 USB 2.0 hosts for mass storage devices
- CompactFlash socket for storage expansion
- Ready-to-run Linux platform
- DIN-Rail or wall mounting installation
- Robust, fanless design
- Wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

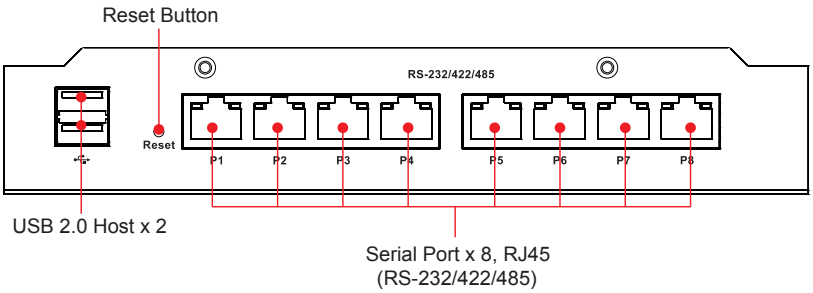
The UC-8410 embedded computers come with 8 RS-232/422/485 serial ports, 3 Ethernet ports, 4 digital input channels, 4 digital output channels, a CompactFlash socket, and 2 USB 2.0 hosts. The UC-8410 computers use the Intel XScale IXP435 533 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but does not generate a lot of heat. The built-in 16 MB NOR Flash ROM and 256 MB SDRAM give you enough memory to run your application software directly on the UC-8410, and the 32 MB NAND Flash can be used for data storage. Moreover, the 256 KB SRAM offers a better data retention mechanism for avoiding data loss.

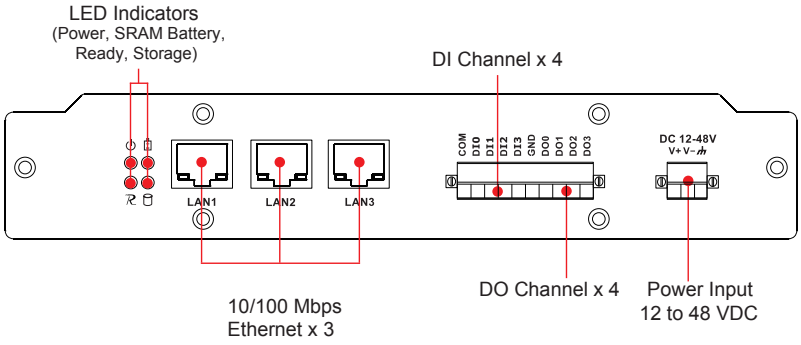
The UC-8410 computers support RS-232/422/485 serial ports, digital I/O channels, and has 3 LAN ports, making them ideal as communication platforms for industrial applications that require network redundancy.

The UC-8410 computers come with the Linux 2.6 platform pre-installed to provide an open standard operating system for software program development. Software written for a desktop PC can be easity ported to the UC-8410 without modifying the code—all that's needed is a common compiler. This makes the UC-8410 an optimal solution for minimizing the cost and effort required for industrial applications.

In addition to the standard model, a wide temperature (-40 to 75°C) model of the UC-8410 is also available for use in harsh industrial environments.

Appearance





Hardware Specifications

Computer

CPU: Intel XScale IXP435, 533 MHz

OS (pre-installed): Linux

DRAM: 256 MB DDR2 SDRAM onboard (512 MB max.)

SRAM: 256 KB, battery backup

Flash:
16 MB NOR Flash onboard to store OS (supports up to 32 MB)
32 MB NAND Flash onboard to store data

USB: USB 2.0 full speed x 2 (OHCI)

Storage

Storage Expansion: CompactFlash socket

Ethernet Interface

LAN: 3 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 8 RS-232/422/485 ports, software-selectable (8-pin RJ45)

ESD Protection: 15 KV for all signals

Console Port: RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

Digital Input

Input Channels: 4, source type

Input Voltage: 0 to 30 VDC

Digital Input Levels for Dry Contacts:
- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:
- Logic level 0: +3V max.
- Logic level 1: +10V to +30V (COM to DI)

Connector Type: 10-pin screw terminal block (4 points, COM, GND)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 4, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 V

Connector Type: 10-pin screw terminal block (4 points, GND)

Isolation: 3 KV optical isolation

LEDs

System: Power, Ready, Storage, Battery for SRAM

LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Serial: TxD x 8, RxD x 8

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 850 g

Dimensions: 200 x 36.5 x 120 mm (7.87 x 1.44 x 4.72 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Anti-vibration: 2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 12 to 48 VDC (3-pin terminal block)

Power Consumption: 15 W
- 300 mA @ 48 VDC
- 620 mA @ 24 VDC
- 1280 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class B, EN55024-4-2, EN55024-4-3, EN55024-4-4), FCC (Part 15 Subpart B, Class B)

Safety: UL/cUL (UL60950-1), CCC (GB9254, GB 17625.1), LVD (EN60950)

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Linux

Kernel Version: 2.6.23

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, PPP, PPPoE, OpenVPN

File System: JFFS2, NFS, Ext2, Ext3, VFAT/FAT

System Utilities: bash, busybox, tinylogin, telnet, ftp, ssh, scp

telnetd: telnet Server daemon

ftpd: FTP server daemon

sshd: secure shell server

Apache: web server daemon, supporting PHP and XML

openvpn: virtual private network service manager

pppd: dial in/out over serial port daemon

snmpd: snmpd agent daemon

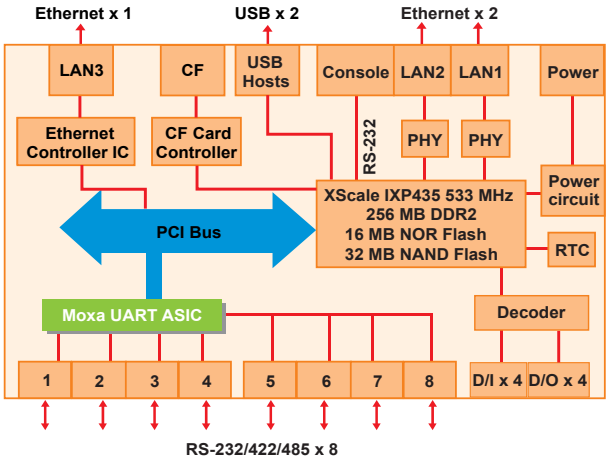
openssl: open SSL

Application Development Software: Moxa Linux API device control

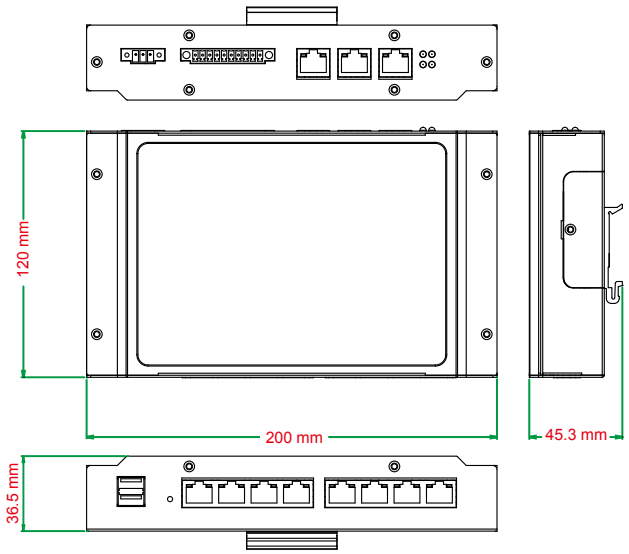
Linux Tool Chain:

- GCC (V4.2.1): C/C++ PC Cross Compiler
- Glibc (V2.2.5): POSIX standard C Library
- GDB (V6.3): source level debug server

H/W Block Diagram



Dimensions (unit = mm)



Ordering Information

Available Models

UC-8410-LX: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature

UC-8410-T-LX: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

Package Checklist

- UC-8410 computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adaptor (includes power jack converter)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

UC-8416 Series

RISC-based industrial embedded computers with 8 serial ports, 3 LANs, DIO, 8 built-in Ethernet switch ports, CompactFlash, USB

- Intel XScale IXP435 533 MHz processor
- 256 MB DDR2 SDRAM and 16 MB Flash ROM onboard
- 32 MB NAND Flash for data storage
- 256 KB battery backup SRAM
- 8 RS-232/422/485 serial ports
- 8 Ethernet switch ports
- 4 digital input and 4 digital output channels
- 3 10/100 Mbps Ethernet ports
- 2 USB 2.0 hosts for mass storage devices
- CompactFlash socket for storage expansion
- Ready-to-run Linux platform
- DIN-Rail or wall mounting installation
- Robust, fanless design
- -40 to 75°C wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The UC-8416 embedded computer comes with 8 RS-232/422/485 serial ports, 3 Ethernet ports, 8 Ethernet switch ports, 4 digital input channels, 4 digital output channels, a CompactFlash socket, and 2 USB 2.0 hosts.

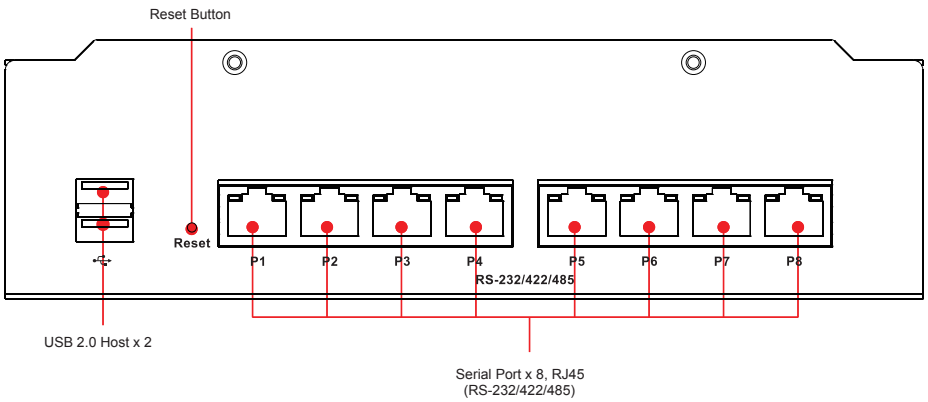
The computer uses the Intel XScale IXP435 533 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 16 MB NOR Flash ROM and 256 MB SDRAM give you enough memory to run your application software directly on the UC-8410, and the 32 MB NAND Flash can be used to provide additional data storage. Moreover, the 256 KB SRAM offers a better data retention mechanism for avoiding data loss.

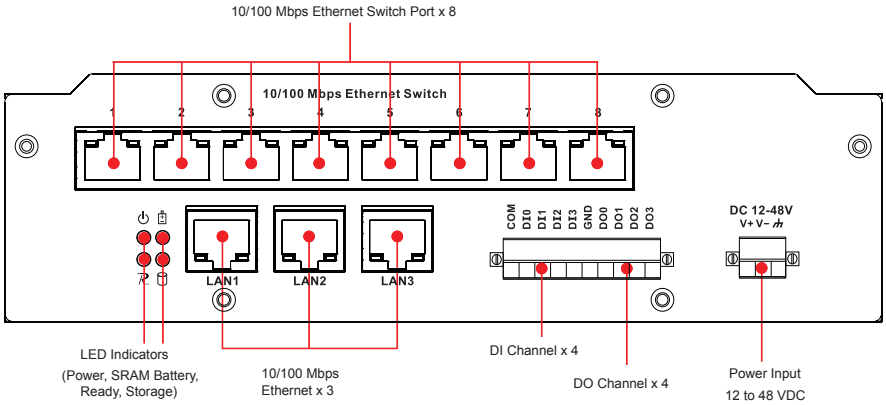
The UC-8416 computer comes with 8 RS-232/422/485 serial ports, digital I/O, and has 3 LAN ports and 8 Ethernet switch ports, making it ideal as a communication platform for industrial applications that require network redundancy.

The UC-8416 comes with the Linux 2.6 platform pre-installed to provide an open software operating system for software program development. Software written for a desktop PC can be easily ported to the UC-8416 platform by using a common compiler, without needing to modify the code. This makes the UC-8416 an optimal solution for use with industrial applications, but with minimal cost and effort.

In addition to the standard model, the UC-8416 also comes in a -40 to 75°C wide temperature model for harsh industrial environments.

Appearance





Hardware Specifications

Computer

CPU: Intel XScale IXP435, 533 MHz

OS (pre-installed): Linux

DRAM: 256 MB DDR2 SDRAM onboard (supports DDR2 up to 512 MB)

SRAM: 256 KB, battery backup

Flash:
16 MB NOR Flash onboard to store OS (supports up to 32 MB)
32 MB NAND Flash onboard to store data

USB: USB 2.0 full speed x 2 (OHCI)

Storage

Storage Expansion: CompactFlash socket

Ethernet Interface

LAN: 3 auto-sensing 10/100 Mbps ports (RJ45)

Switch Ports: 8 10/100 Mbps unmanaged ports

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 8 RS-232/422/485 ports, software-selectable (8-pin RJ45)

Console Port: RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

Digital Input

Input Channels: 4, source type

Input Voltage: 0 to 30 VDC

Digital Input Levels for Dry Contacts:
- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:
- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (COM to DI)

Connector Type: 10-pin screw terminal block (4 points, COM, GND)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 4, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 V

Connector Type: 10-pin screw terminal block (4 points, GND)

Isolation: 3 KV optical isolation

LEDs

System: Power, Ready, Storage, Battery for SRAM

LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Serial: TxD x 8, RxD x 8

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 930 g

Dimensions: 200 x 56 x 120 mm (7.87 x 2.20 x 4.72 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Anti-Vibration: 2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-Shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 12 to 48 VDC (3-pin terminal block)

Power Consumption: 15 W
- 310 mA @ 48 VDC
- 620 mA @ 24 VDC
- 1350 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class B, EN55024-4-2, EN55024-4-3, EN55024-4-4), FCC (Part 15 Subpart B, Class B)

Safety: UL/cUL (UL60950-1), CCC (GB9254, GB 17625.1), LVD (EN60950)

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Linux

Kernel Version: 2.6.23

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, PPP, PPPoE, OpenVPN

File System: JFFS2, NFS, Ext2, Ext3, VFAT/FAT

System Utilities: bash, busybox, tinylogin, telnet, ftp, ssh, scp

telnetd: telnet Server daemon

ftpd: FTP server daemon

sshd: secure shell server

Apache: web server daemon, supporting PHP and XML

openvpn: virtual private network service manager

pppd: dial in/out over serial port daemon

snmpd: snmpd agent daemon

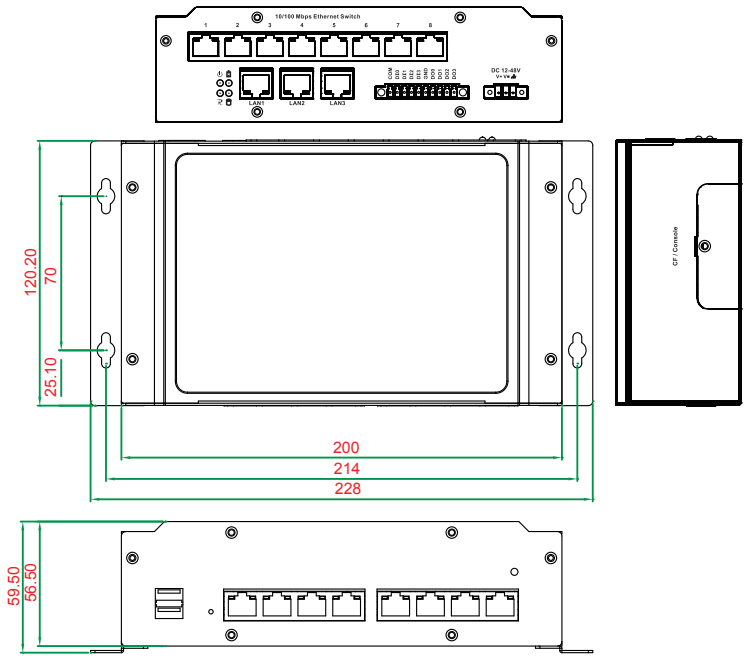
openssl: open SSL

Application Development Software: Moxa Linux API device control

Linux Tool Chain:

- GCC (V4.2.1): C/C++ PC Cross Compiler
- Glibc (V2.2.5): POSIX standard C Library
- GDB (V6.3): source level debug server

Dimensions (unit = mm)



Ordering Information

Available Models

UC-8416-LX: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, 8 switch ports, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature

UC-8416-T-LX: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, 8 switch ports, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

Package Checklist

- UC-8416 computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal Power Adaptor (including power jack converter)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

UC-8418 Series

RISC-based industrial embedded computers with 8 serial ports, 3 LANs, DIO, 2 CAN Ports ,CompactFlash, USB

- Intel XScale IXP435 533 MHz processor
- 256 MB DDR2 SDRAM and 16 MB Flash ROM onboard
- 32 MB NAND Flash for data storage
- 256 KB battery backup SRAM
- 8 RS-232/422/485 serial ports
- 2 CANbus ports
- 12 digital input and 12 digital output channels
- 3 10/100 Mbps Ethernet ports
- 2 USB 2.0 hosts for mass storage devices
- CompactFlash socket for storage expansion
- Ready-to-run Linux platform
- DIN-Rail or wall mounting installation
- Robust, fanless design
- -40 to 75°C wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

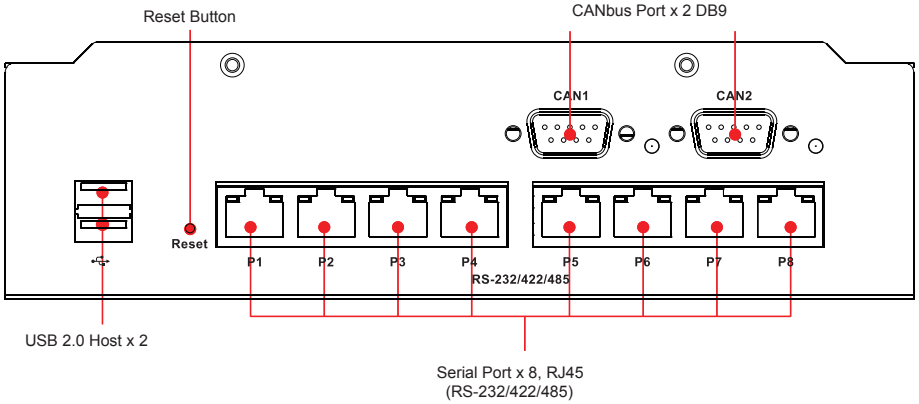
The UC-8418 embedded computer comes with 8 RS-232/422/485 serial ports, 3 Ethernet ports, 2 CAN ports, 12 digital input channels, 12 digital output channels, a CompactFlash socket, and 2 USB 2.0 hosts.

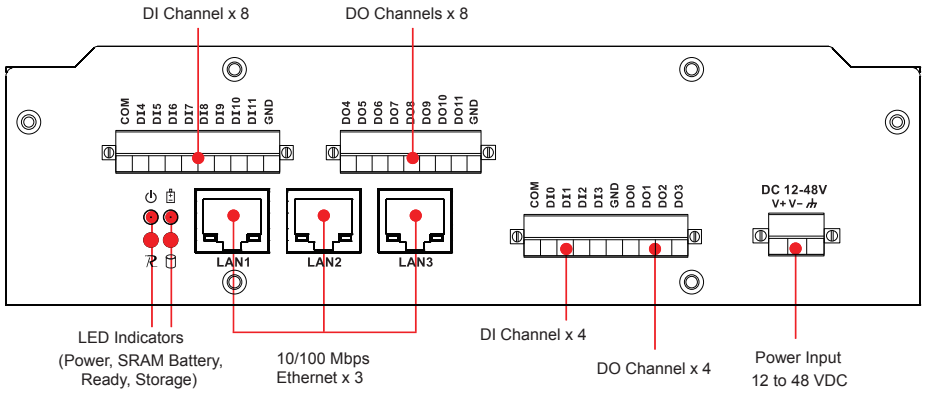
The computer uses the Intel XScale IXP435 533 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 16 MB NOR Flash ROM and 256 MB SDRAM give you enough memory to run your application software directly on the UC-8410, and the 32 MB NAND Flash can be used to provide additional data storage. Moreover, the 256 KB SRAM offers a better data retention mechanism for avoiding data loss. The UC-8418 computer comes with 8 RS-232/422/485 serial ports, digital I/O, and has 3 LAN ports and 2 CANbus ports, making it ideal as a communication platform for industrial applications that require network redundancy.

The UC-8418 comes with the Linux 2.6 platform pre-installed to provide an open software operating system for software program development. Software written for a desktop PC can be easily ported to the UC-8418 platform by using a common compiler, without needing to modify the code. This makes the UC-8418 an optimal solution for use with industrial applications, but with minimal cost and effort.

In addition to the standard model, UC-8418 also comes in a -40 to 75°C wide temperature model for harsh industrial environments.

Appearance





Hardware Specifications

Computer

CPU: Intel XScale IXP435, 533 MHz

OS (pre-installed): Linux

DRAM: 256 MB DDR2 SDRAM onboard (supports DDR2 up to 512 MB)

SRAM: 256 KB, battery backup

Flash:
16 MB NOR Flash onboard to store OS (supports up to 32 MB)
32 MB NAND Flash onboard to store data

USB: USB 2.0 full speed x 2 (OHCI)

Storage

Storage Expansion: CompactFlash socket

Ethernet Interface

LAN: 3 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 8 RS-232/422/485 ports, software-selectable (8-pin RJ45)

Console Port: RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

Digital Input

Input Channels: 12, source type

Input Voltage: 0 to 30 VDC

Digital Input Levels for Dry Contacts:
- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:
- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (COM to DI)

Connector Type: 10-pin screw terminal block (4 points, COM, GND)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 12, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 V

Connector Type: 10-pin screw terminal block (4 points, GND)

Isolation: 3 KV optical isolation

CANbus Communication

Interface: Dual optically isolated CAN2.0A/2.0B compliant ports

CAN Controller: Phillips SJA1000T

Signals: CAN-H, CAN-L

Protocols: Supports CANOpen library

Isolation: 2 KV optical isolation

Speed: 10 Kbps to 1 Mbps

Connector Type: DB9 male

LEDs

System: Power, Ready, Storage, Battery for SRAM

LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Serial: TxD x 8, RxD x 8

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 1 kg

Dimensions: 200 x 56 x 120 mm (7.87 x 2.20 x 4.72 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 75°C (-4 to 167°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Anti-Vibration: 2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-Shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 12 to 48 VDC (3-pin terminal block)

Power Consumption: 15 W
- 310 mA @ 48 VDC
- 620 mA @ 24 VDC
- 1350 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class B, EN55024-4-2, EN55024-4-3, EN55024-4-4), FCC (Part 15 Subpart B, Class B)

Safety: UL/cUL (UL60950-1), CCC (GB9254, GB 17625.1), LVD (EN60950)

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Linux

Kernel Version: 2.6.23

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, PPP, PPPoE, OpenVPN

File System: JFFS2, NFS, Ext2, Ext3, VFAT/FAT

System Utilities: bash, busybox, tinylogin, telnet, ftp, ssh, scp

telnetd: telnet Server daemon

ftpd: FTP server daemon

sshd: secure shell server

Apache: web server daemon, supporting PHP and XML

openvpn: virtual private network service manager

pppd: dial in/out over serial port daemon

snmpd: snmpd agent daemon

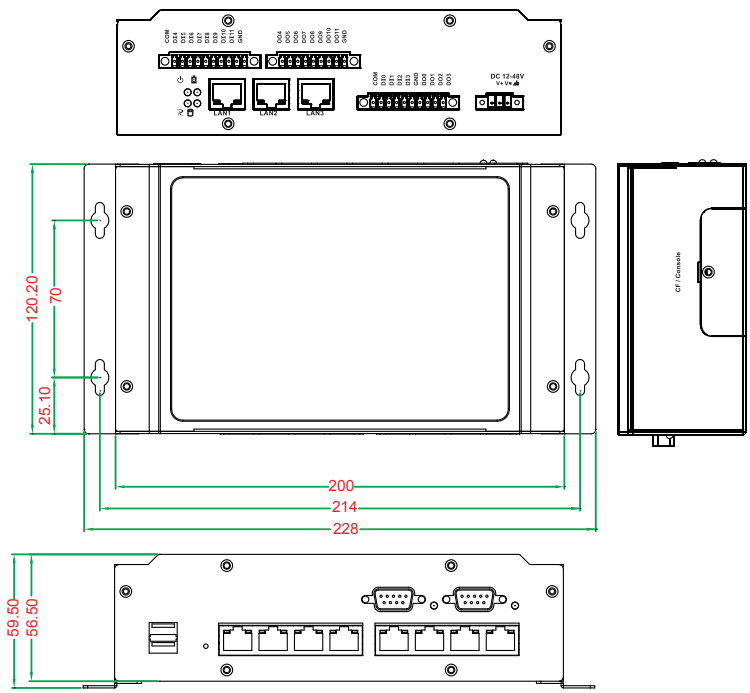
openssl: open SSL

Application Development Software: Moxa Linux API device control

Linux Tool Chain:

- GCC (V4.2.1): C/C++ PC Cross Compiler
- Glibc (V2.2.5): POSIX standard C Library
- GDB (V6.3): source level debug server

Dimensions (unit = mm)



Ordering Information

Available Models

UC-8418-LX: RISC-based industrial embedded computer with 8 serial ports, 12 DIs, 12 DOs, 3 LANs, 2 CAN ports, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature

UC-8418-T-LX: RISC-based industrial embedded computer with 8 serial ports, 12 DIs, 12 DOs, 3 LANs, 2 CAN ports, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

Package Checklist

- UC-8418 computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal Power Adaptor (including power jack converter)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

UC-7402 Series

RISC-based ready-to-run network computers with built-in web server, dual LANs, PCMCIA, CompactFlash

- Intel XScale IXP422/425, 266/533 MHz processor
- On-board 128 MB RAM, 32 MB flash
- Dual 10/100 Mbps Ethernet for network redundancy
- CompactFlash socket for storage expansion
- PCMCIA supporting WLAN, GPRS, UMTS, HSDPA
- Ready-to-run Linux platform
- Hardware level data encryption engine supports AES, DES, and 3DES
- SSL, SSH, TLS security function
- Built-in firewall and VPN function
- Apache web server supports PHP and XML
- DIN-rail or wall-mount installation

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

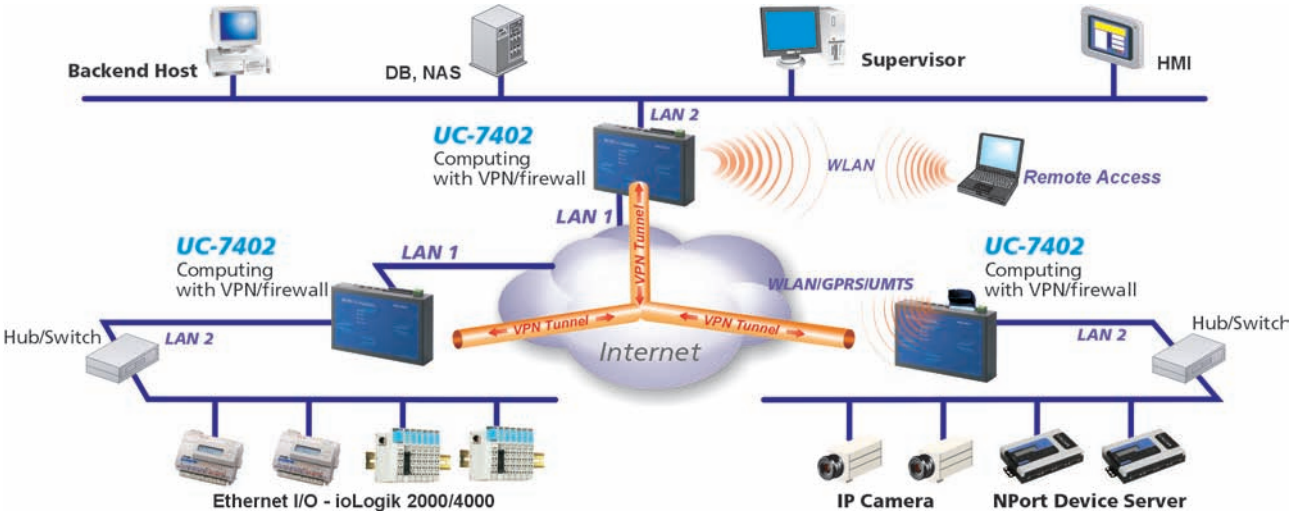
Overview

The UC-7402 embedded computers are web server network computers that feature dual 10/100 Mbps Ethernet ports, a PCMCIA interface for wireless LAN communication, and CompactFlash for mass storage disk expansion. The UC-7402 computers are an excellent choice for embedded network applications and a variety of machine-to-machine solutions.

The UC-7402 computers are rugged, compact embedded computers designed for industrial applications. Two key design features are low power consumption and fanless operation, which together ensure greater reliability and longer system life. The communication oriented functionality includes both hardware and software. In fact, the software design is ideal for network communication applications, such as connecting to machines and other devices over a network. The UC-7402 computers provide real-time data access, a secure network gateway, and a VPN router. The built-in web server allows the UC-7402 computers to be used as a web-enabled gateway for accessing monitoring and control functions from anywhere on the network.

Since the UC-7402 series provides WLAN 802.11b/g connectivity, both wired and wireless networks can be integrated into one communication system. Users can capture real-time data from the network, and then use the UC-7402 to convert data into various standard formats. Data can be buffered and then distributed to the proper web browser.

Typical Application



Hardware Specifications

Computer

CPU:
UC-7402: Intel XScale IXP422 266 MHz
UC-7402 Plus: Intel XScale IXP425 533 MHz

OS (pre-installed): Embedded Linux

DRAM: 128 MB onboard (256 MB for ODM)

Flash: 32 MB onboard

PCMCIA: Cardbus card and 16-bit PCMCIA 2.1/JEIDA 4.2 card

Storage

Storage Expansion: CompactFlash socket

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Console Port: RS-232 (all signals), RJ45 connector, supports PPP

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

LEDs

System: OS Ready, Console (TxD/RxD)

LAN: 10M/100M x 2

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 830 g

Dimensions: 197 x 44 x 125 mm (7.76 x 1.73 x 4.92 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 80°C (-4 to 176°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 4.3 W
• 180 mA @ 24 VDC
• 360 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Software Specifications

Linux

Kernel Version: 2.4.18 or 2.6.10 (Plus version)

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

Application Development Software:
• Moxa Linux API Library for device control
• Linux Tool Chain: Gcc, Glibc, GDB

Ordering Information

Available Models

UC-7402-LX: RISC-based IXP422 embedded computer with dual LANs, PCMCIA, CompactFlash, Linux 2.4

UC-7402-LX Plus: RISC-based IXP425 embedded computer with dual LANs, PCMCIA, CompactFlash, Linux 2.6

Package Checklist

- UC-7402 computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-RJ45F9-150: 8-pin RJ45 to DB9 female console port cable, 150 cm
- Universal power adaptor (including terminal block to power jack converter)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

UC-7408 Series

RISC-based data acquisition computers with 8 serial ports, 8 DI/DO channels, dual LANs, PCMCIA, CompactFlash

- Intel XScale IXP422/425, 266/533 MHz processor
- 128 MB RAM on-board, 32 MB flash disk
- 8 RS-232/422/485 serial ports
- 8-ch digital input and 8-ch digital output (TTL Signal)
- Dual 10/100 Mbps Ethernet for network redundancy
- CompactFlash socket for storage expansion
- PCMCIA supporting WLAN, GPRS, UMTS, HSDPA
- Ready-to-run Linux or WinCE 5.0 platform
- DIN-rail or wallmount installation
- Robust, fanless design
- -40 to 75°C wide temperature models available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The UC-7408 data acquisition embedded computers feature 8 RS-232/422/485 serial ports, an 8-ch digital input and 8-ch digital output, dual 10/100 Mbps ports, a PCMCIA interface for wireless LAN communication, and CompactFlash slot for mass storage disk expansion.

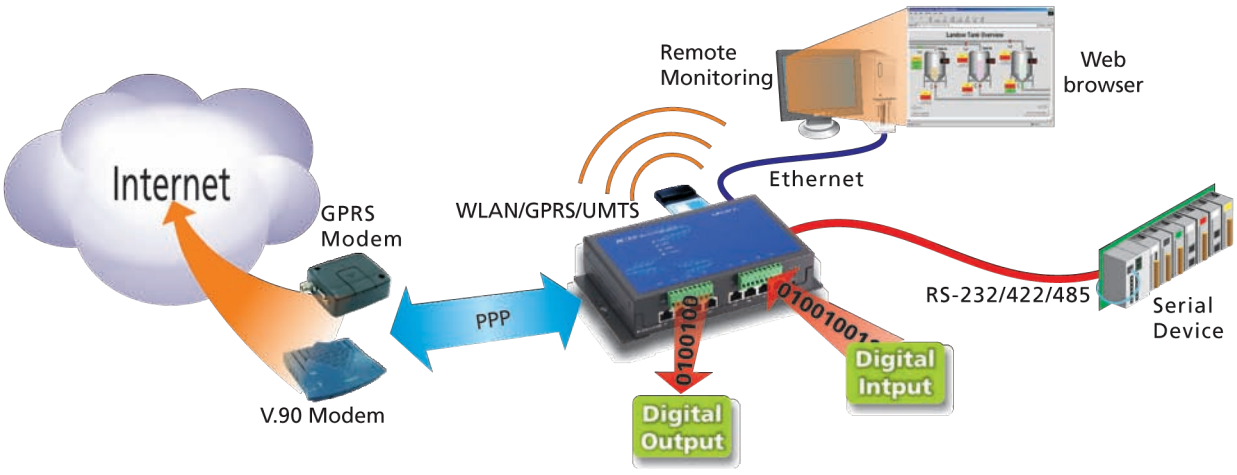
The digital I/O feature of the UC-7408 series provides users with the convenience of connecting digital devices to a front-end embedded computer. The UC-7408 can be used for on/off event handling by reading the state change of the digital input signal. In addition, output signals from external digital devices can be imported through the UC-7408's digital input channels, and the UC-7408 can be programmed to take immediate action when it detects a change in the state of the signal.

The digital output channels on the UC-7408 can connect to devices and trigger digital output signals to control external digital devices. With the digital I/O feature, Moxa's embedded computers support both data acquisition and protocol conversion through the RS-232/422/485 serial ports, and simple I/O control with the digital I/O signals.

UC-7408 embedded computers come pre-installed with either the open standard Linux OS, or the more common WinCE OS. Software written for a desktop PC can be easily ported to the UC-7408 platform by using a common compiler, without needing to modify the code, and the software you develop for your own applications can be stored in the UC-7408's flash memory.

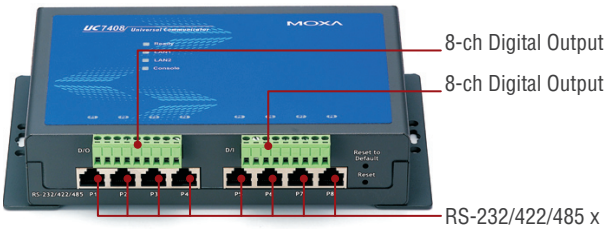
In addition to the standard model, a wide temperature (-40 to 75°C) model of the UC-7408 is available for use in harsh industrial environments.

Typical Application

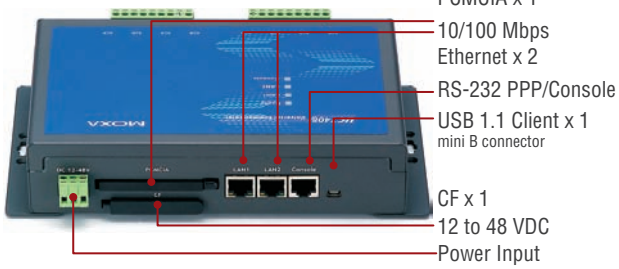


Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU:
UC-7408: Intel XScale IXP422 266 MHz
UC-7408 Plus: Intel XScale IXP425 533 MHz

OS (pre-installed): Embedded Linux or Windows CE 5.0

DRAM: 128 MB onboard (256 MB for ODM)

Flash: 32 MB onboard

PCMCIA: Cardbus card and 16-bit PCMCIA 2.1 or JEIDA 4.2 card

Storage

Storage Expansion: CompactFlash socket

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 8 RS-232/422/485 ports, software-selectable (8-pin RJ45)

ESD Protection: 15 KV for all signals

Console Port: RS-232 (all signals), RJ45 connector, supports PPP

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

Digital Input

Input Channels: 8

Input Voltage:
• Logic 0: 0-0.8 V
• Logic 1: 2.0-5.5 V

-24 mA

Digital Output

Output Channels: 8

Output Current: 24 mA

Output Voltage:
• Logic 0: 0-0.55 V
• Logic 1: 2.5-3.3 V

LEDs

System: OS Ready, Console (TxD/RxD)

LAN: 10M/100M x 2

Serial: TxD x 8, RxD x 8

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 870 g

Dimensions: 197 x 44 x 125 mm (7.76 x 1.73 x 4.92 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Anti-vibration: 1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 min 17 sec per axis

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 7.6 W
• 315 mA @ 24 VDC
• 628 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

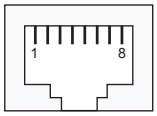
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

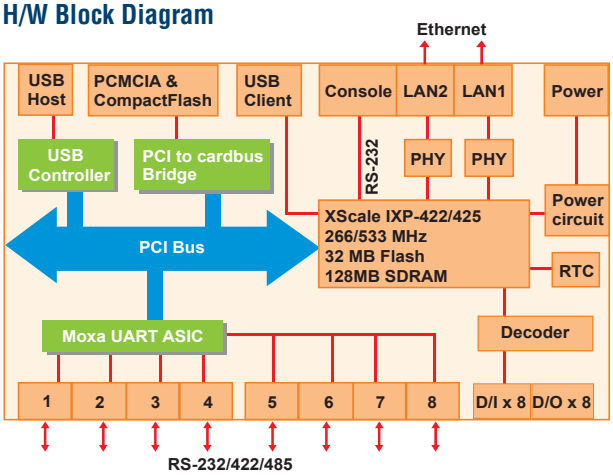
Pin Assignment

8-pin RJ45



PIN	RS-232	RS-422/RS-485-4w	RS-485
1	DSR	---	---
2	RTS	TxD+	---
3	GND	GND	GND
4	TxD	TxD-	---
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	---	---
8	DTR	---	---

H/W Block Diagram



Software Specifications

Linux

Kernel Version: 2.4.18 or 2.6.10 (Plus version)

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

Application Development Software:
- Moxa Linux API Library for device control
- Linux Tool Chain: Gcc, Glibc, GDB

Windows Embedded CE 5.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

Web Server (httpd): WinCE IIS, including ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

Dial-up Networking Service: RAS client API and PPP, supporting Extensible Authentication Protocol (EAP) and RAS scripting.

Application Development Environment:
- Moxa WinCE 5.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft Foundation Classes (MFC)
- Microsoft® .NET Compact Framework 2.0 SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX2
- SOAP Toolkit
- Winsock 2.2

Ordering Information

Available Models

UC-7408-LX: RISC-based IXP422 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, Linux 2.4, -10 to 60°C operating temperature

UC-7408-LX Plus: RISC-based IXP425 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, USB, Linux 2.6, -10 to 60°C operating temperature

UC-7408-CE: RISC-based IXP422 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, WinCE 5.0, -10 to 60°C operating temperature

UC-7408-T-LX: RISC-based IXP422 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, Linux 2.4, -40 to 75°C operating temperature

UC-7408-T-LX Plus: RISC-based IXP425 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, USB, Linux 2.6, -40 to 75°C operating temperature

UC-7408-T-CE: RISC-based IXP422 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, WinCE 5.0, -40 to 75°C operating temperature

Package Checklist

- UC-7408 embedded computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-RJ45F9-150: 8-pin RJ45 to DB9 female console port cable, 150 cm
- Universal power adaptor (including terminal block to power jack converter)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

UC-7410/7420 Series

RISC-based ready-to-run computers with 8 serial ports, dual LANs, USB, PCMCIA, CompactFlash

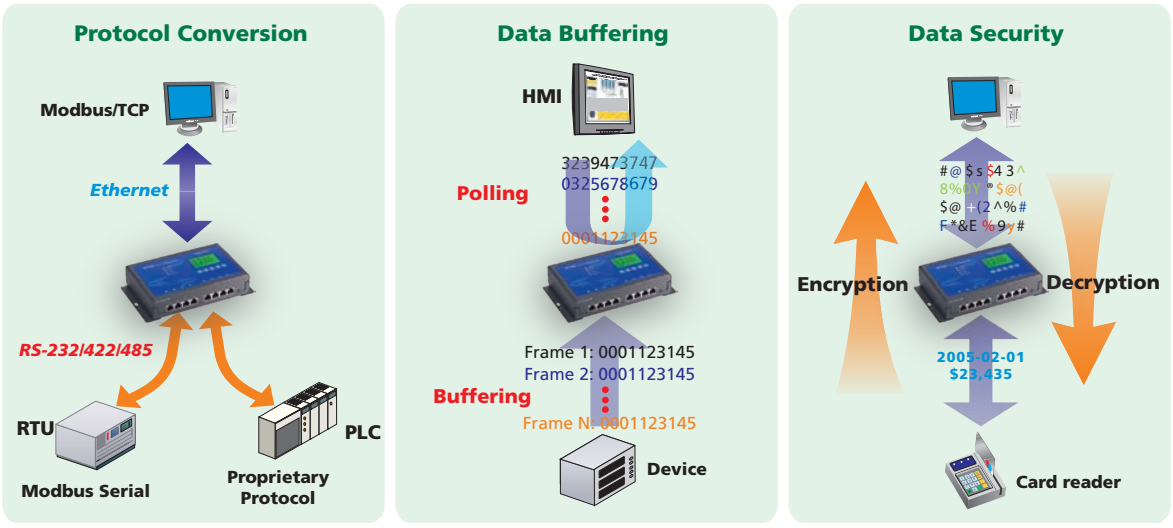
- Intel XScale IXP422/425, 266/533 MHz processor
- 128 MB RAM on-board, 32 MB flash
- 8 RS-232/422/485 serial ports
- Dual 10/100 Mbps Ethernet for network redundancy
- USB 2.0 host
- CompactFlash socket for storage expansion
- PCMCIA supports WLAN, GPRS, UMTS, HSDPA
- LCM display and keypad for HMI ready-to-run Linux or WinCE 5.0 platform
- DIN-rail or wallmount installation
- Robust, fanless design

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The UC-7410/UC-7420 RISC-based ready-to-run Linux and WinCE computers are designed for embedded applications. The computers feature 8 RS-232/422/485 serial ports, a PCMCIA interface for wireless LAN communication, CompactFlash, and USB ports for adding external memory. The pre-installed open-standard Linux or WinCE operating system makes a convenient platform for software development. Software written for a desktop PC can be ported "as is" to the UC-7410/UC-7420 platform using readily available development tools, and the code can be stored in the UC-7410/UC-7420's Flash memory. System integrators use UC-7410/UC-7420 computers as part of distributed control systems based on embedded technology.

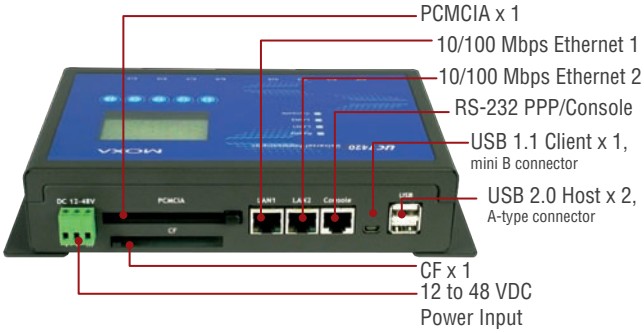
Typical Applications



Appearance

Front View

Rear View



Hardware Specifications

Computer

CPU:
UC-7410/7420: Intel XScale IXP422 266 MHz
UC-7410/7420 Plus: Intel XScale IXP425 533 MHz

OS (pre-installed): Embedded Linux or Windows CE 5.0

DRAM: 128 MB onboard (256 MB for ODM)

Flash: 32 MB onboard

PCMCIA: Cardbus card and 16-bit PCMCIA 2.1/JEIDA 4.2 card (UC-7420 only)

Storage

Storage Expansion: CompactFlash socket (UC-7420 only)

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 8 RS-232/422/485 ports, software-selectable (8-pin RJ45)

ESD Protection: 15 KV for all signals

Console Port: RS-232 (all signals), RJ45 connector, supports PPP

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

LEDs

System: OS Ready, Console (TxD/RxD)

LAN: 10M/100M x 2

Serial: TxD x 8, RxD x 8

Mini Screen with Push Buttons

LCD Panel: Liquid Crystal Display on the case, 128 x 64 dot graphics mode

Push Buttons: Five membrane buttons for convenient on-site configuration

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight:
UC-7410: 810 g
UC-7420: 875 g

Dimensions: 197 x 44 x 125 mm (7.76 x 1.73 x 4.92 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 80°C (-4 to 176°F)

Anti-vibration: 1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 min 17 sec per axis

Anti-shock: 5 g @ IEC-68-2-27, half sine wave, 30 ms

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
UC-7410: 10 W
• 415 mA @ 24 VDC
• 830 mA @ 12 VDC
UC-7420: 11 W
• 450 mA @ 24 VDC
• 890 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

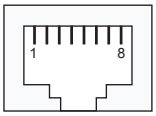
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

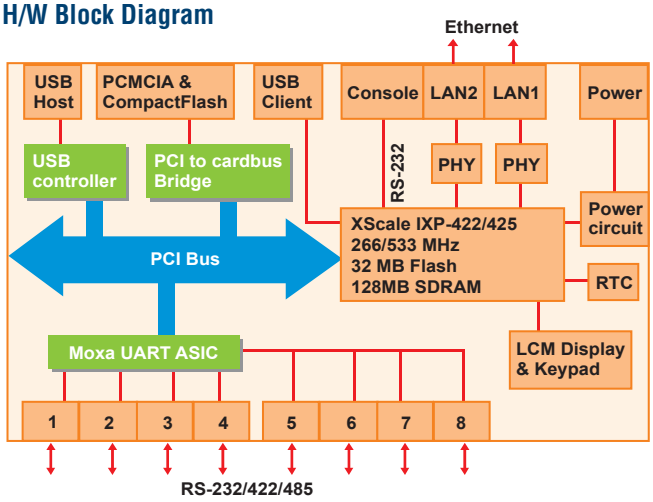
Pin Assignment

8-pin RJ45



PIN	RS-232	RS-422/RS-485-4w	RS-485
1	DSR	---	---
2	RTS	TxD+	---
3	GND	GND	GND
4	TxD	TxD-	---
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	---	---
8	DTR	---	---

H/W Block Diagram



Software Specifications

Linux

Kernel Version: 2.4.18 or 2.6.10 (Plus version)

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

Application Development Software:
- Moxa Linux API Library for device control
- Linux Tool Chain: Gcc, Glibc, GDB

Windows Embedded CE 5.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

Web Server (httpd): WinCE IIS, including ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

Dial-up Networking Service: RAS client API and PPP, supporting Extensible Authentication Protocol (EAP) and RAS scripting.

Application Development Environment:
- Moxa WinCE 5.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft Foundation Classes (MFC)
- Microsoft® .NET Compact Framework 2.0 SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX2
- SOAP Toolkit
- Winsock 2.2

Ordering Information

Available Models

UC-7410-LX: RISC-based IXP422 embedded computer with 8 serial ports, dual LANs, Linux 2.4

UC-7410-LX Plus: RISC-based IXP425 embedded computer with 8 serial ports, dual LANs, Linux 2.6

UC-7420-LX: RISC-based IXP422 embedded computer with 8 serial ports, dual LANs, USB, PCMCIA, CompactFlash, Linux 2.4

UC-7420-LX Plus: RISC-based IXP425 embedded computer with 8 serial ports, dual LANs, USB, PCMCIA, CompactFlash, Linux 2.6

UC-7410-CE: RISC-based IXP422 embedded computer with 8 serial ports, dual LANs, WinCE 5.0

UC-7420-CE: RISC-based IXP422 embedded computer with 8 serial ports, dual LANs, USB, PCMCIA, CompactFlash, WinCE 5.0

Package Checklist

- UC-7410 or UC-7420 computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-RJ45F9-150: 8-pin RJ45 to DB9 female console port cable, 150 cm
- CBL-RJ45M9-150: 8-pin RJ45 to DB9 male serial port cable, 150 cm
- Universal power adaptor
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

UC-7122/7124 Series

Mini RISC-based ready-to-run computer with dual LANs, 2 or 4 serial ports, SD, USB

- Cirrus Logic EP9302 ARM9 32-bit 200 MHz processor
- On-board 32 MB RAM, 16 MB flash disk
- 2 or 4 software-selectable RS-232/422/485 serial ports
- 50 bps to 921.6 Kbps baudrate (non-standard baudrates supported)
- Dual 10/100 Mbps Ethernet for network redundancy
- SD socket for storage expansion supported
- Built-in real-time clock (RTC), buzzer, watchdog timer (WDT)
- Ready-to-run WinCE 5.0 platform
- -40 to 75°C wide temperature models available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

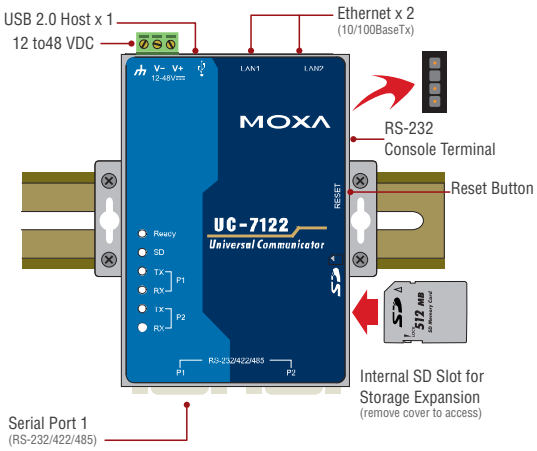
The UC-7122/7124 embedded computers come with 2 or 4 RS-232/422/485 serial ports and dual 10/100 Mbps Ethernet LAN ports to provide users with a versatile communication platform, making these RISC-based embedded computers ideal for your embedded applications.

The UC-7122/7124 embedded computers use the Cirrus Logic EP9302 ARM9 200 MHz RISC CPU. Unlike the X86 CPU, which uses a CISC design, the ARM9's RISC design architecture and modern semiconductor technology provide the UC-7122/7124 with a powerful computing engine and communication functions, but without generating too much heat. Moreover, the built-in 16 MB NOR Flash ROM and 16 MB SDRAM give you enough storage capacity to run applications on the UC-7122/7124 computers. The additional SD socket provides the flexibility of adding storage expansion disks, and the dual LAN ports built into the ARM9 make the UC-7122/7124 ideal communication platforms for simple data acquisition and protocol conversion applications. In addition, the RS-232/422/485 serial ports allow you to connect a variety of serial devices. Taken together, these features ensure that the UC-7122/7124 embedded computers are convenient and powerful central control units for industrial applications, such as data acquisition, remote device control and monitoring, and protocol conversion.

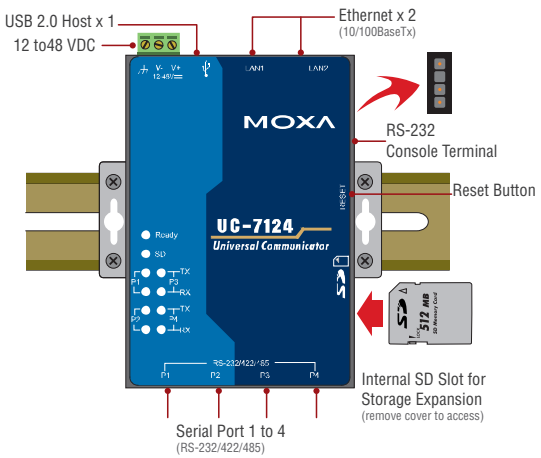
The pre-installed WinCE 5.0 operating system provides a common Windows-based software operating system for software program development. This means that software written in Visual C/C++ for desktop PCs is easily ported to the UC-7122/7124 computers with a general programming tool such as Microsoft Embedded Visual C++ or Microsoft Visual Studio 2005. You will not need to spend time modifying existing software code, and the operating system, device drivers, and your own software can all be stored in the UC-7122/7124's flash memory.

Appearance

UC-7122



UC-7124



Hardware Specifications

Computer

CPU: Cirrus EP9302 ARM9 CPU, 200 MHz

OS (pre-installed): Windows CE 5.0

DRAM: 32 MB onboard (64 MB for ODM)

Flash: 16 MB onboard (32 MB for ODM)

Storage

Storage Expansion: SD slot

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 2 or 4 RS-232/422/485 ports, software-selectable (8-pin RJ45)

ESD Protection: 15 KV for all signals

Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

LEDs

System: Ready, SD

LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Serial: TxD, RxD (2 or 4 of each)

Physical Characteristics

Housing: Aluminum (1 mm)

Weight:
UC-7122: 190 g
UC-7124: 200 g

Dimensions: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Anti-vibration: 1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 min 17 sec per axis

Anti-shock: 2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:

UC-7122: 4.1 W	UC-7124: 4.3 W
• 170 mA @ 24 VDC	• 180 mA @ 24 VDC
• 340 mA @ 12 VDC	• 360 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Safety:
LVD: EN60950-1
UL/cUL: UL60950-1, CSA C22.2 No. 60950-1-03

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty

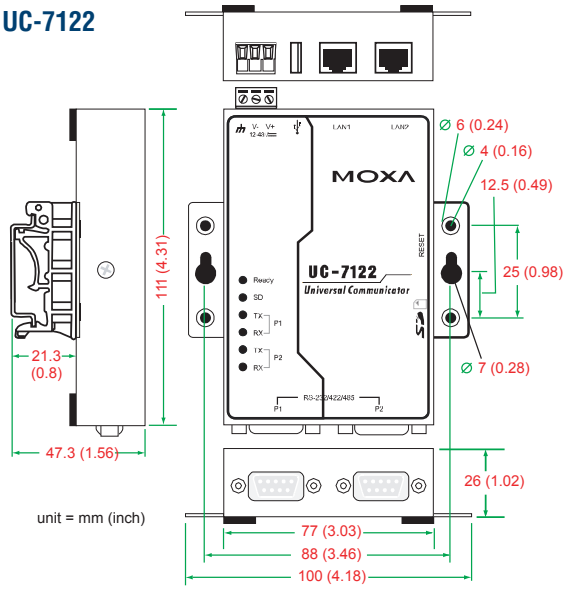
Warranty Period: 5 years

Details: See www.moxa.com/warranty

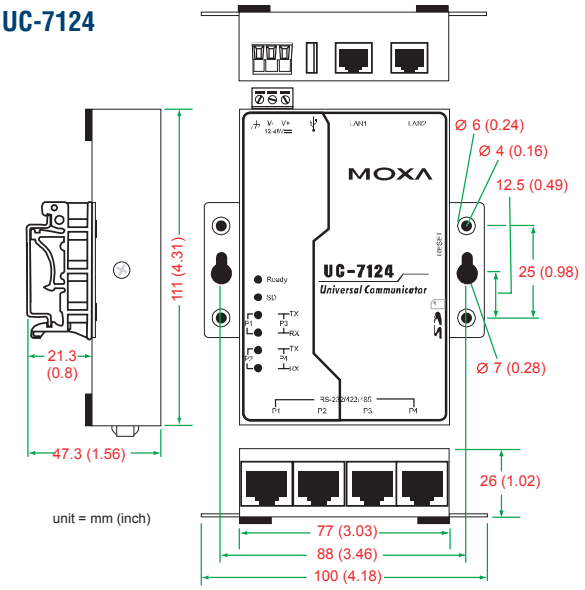
Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Dimensions

UC-7122

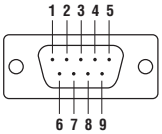


UC-7124



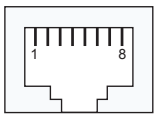
Pin Assignment

UC-7122 (DB9 male connector)



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

UC-7124 (8-pin RJ45 connector)



PIN	RS-232	RS-422/485-4w	RS-485
1	DSR	---	---
2	RTS	TxD+	---
3	GND	GND	GND
4	TxD	TxD-	---
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	---	---
8	DTR	---	---

Software Specifications

Windows Embedded CE 5.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: TFAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

Web Server (httpd): WinCE IIS, including ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

Dial-up Networking Service: RAS client API and PPP, supporting Extensible Authentication Protocol (EAP) and RAS scripting.

Application Development Environment:
- Moxa WinCE 5.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft Foundation Classes (MFC)
- Microsoft .NET Compact Framework 2.0 SP2
- Winsock 2.2

Ordering Information

Available Models

UC-7122-CE: Mini RISC-based embedded computer with 2 serial ports, dual LANs, SD, USB, WinCE 5.0, -10 to 60°C operating temperature

UC-7124-CE: Mini RISC-based embedded computer with 4 serial ports, dual LANs, SD, USB, WinCE 5.0, -10 to 60°C operating temperature

UC-7122-T-CE: Mini RISC-based embedded computer with 2 serial ports, dual LANs, SD, USB, WinCE 5.0, -40 to 75°C operating temperature

UC-7124-T-CE: Mini RISC-based embedded computer with 4 serial ports, dual LANs, SD, USB, WinCE 5.0, -40 to 75°C operating temperature

Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail

Package Checklist

- UC-7122 or UC-7124 computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- CBL-RJ45M9-150: 8 pin RJ45 to DB9 male serial port cable, 150 cm
- Universal power adaptor (including terminal block to power jack converter)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

UC-7110/7112 Series

Mini RISC-based ready-to-run computer with 2 serial ports, dual LANs, SD

- MOXA ART ARM9 32-bit 192 MHz processor
- 16 or 32 MB RAM
- 8 or 16 MB Flash ROM
- Dual 10/100 Mbps Ethernet for network redundancy
- 2 software-selectable RS-232/422/485 ports
- 50 bps to 921.6 Kbps baudrate (non-standard baudrates supported)
- SD socket for storage expansion
- Built-in real-time clock (RTC) and buzzer
- Pre-installed Linux Kernel 2.6 platform
- -40 to 75°C wide temperature models available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

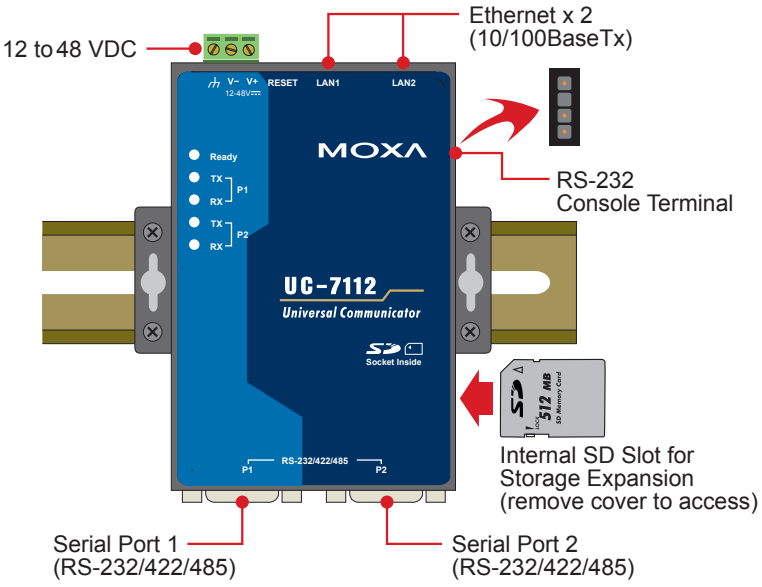
Overview

The UC-7110/UC-7112 mini RISC-based communication platforms are ideal for embedded applications. The computers come with 2 RS-232/422/485 serial ports and dual 10/100 Mbps Ethernet LAN ports to provide users with a versatile communication platform.

The UC-7110/UC-7112 use the ARM9 RISC CPU. Unlike the X86 CPU, which uses a CISC design, the ARM9's RISC design architecture and modern semiconductor technology provide the CPU with a powerful computing engine and communication functions, but without generating too much heat. The built-in 8 or 16 MB NOR Flash ROM and 16 or 32 MB SDRAM provide plenty of storage, and the SD socket on the UC-7112 provides the user with flexible storage expansion to run applications that generate a lot of data. The dual LAN ports built into the ARM9 make the UC-7110/UC-7112 ideal communication platforms for some data acquisition and protocol conversion applications, and the 2 RS-232/422/485 serial ports allow you to connect a variety of serial devices.

The pre-installed µClinux operating system provides an open software operating system for software program development. This means that software written for desktop PCs can be easily ported to a UC-7110 or UC-7112 embedded computer with a GNU cross complier, so that you will not need to spend time modifying existing software code. The operating system, device drivers, and your own software can all be stored in the UC-7110/7112's flash memory.

Appearance



Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit RISC CPU, 192 MHz

OS (pre-installed): µClinux or Linux

DRAM:
UC-7110/UC-7112: 16 MB (32 MB for ODM)
UC-7112 Plus: 32 MB onboard (64 MB for ODM)

Flash:
UC-7110/UC-7112: 8 MB onboard (16 MB for ODM)
UC-7112 Plus: 16 MB onboard

Storage

Storage Expansion: SD slot (UC-7112 and UC-7112 Plus only)

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 2 RS-232/422/485 ports, software-selectable (DB9 male)

ESD Protection: 15 KV for all signals

Console Port: RS-232, 3-wire (TxD, RxD, GND), pin-header

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

LEDs

System: OS Ready

LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Serial: TxD x 2, RxD x 2

Physical Characteristics

Housing: Aluminum (1 mm)

Weight: 190 g

Dimensions: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Anti-Vibration: 1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 min 17 sec per axis (UC-7110 only)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 4.5 W
- 170 mA @ 24 VDC
- 340 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

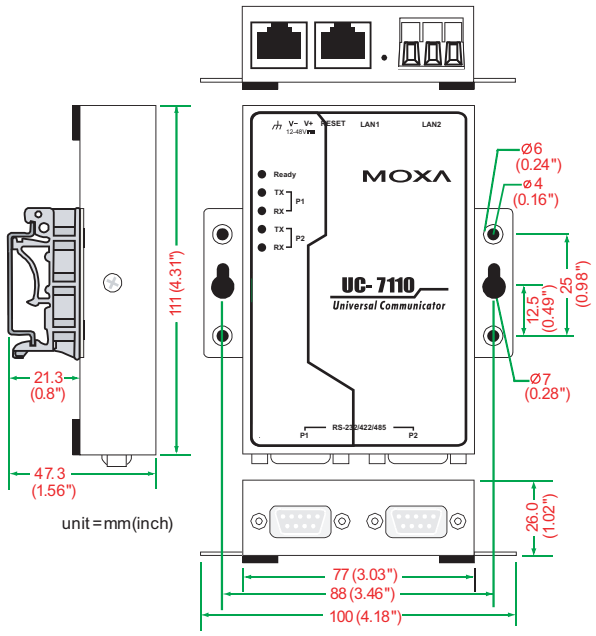
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

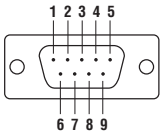
Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Dimensions



Pin Assignment

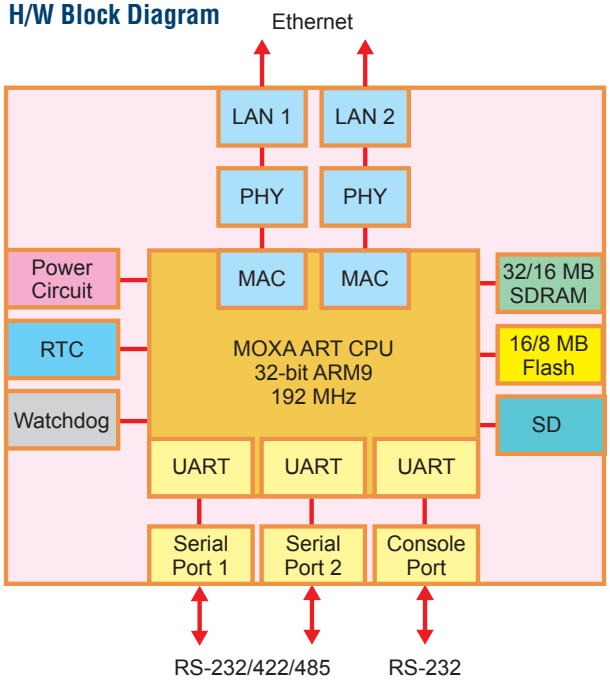
DB9 male connector



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Serial consol port

H/W Block Diagram



Software Specifications

Linux

Kernel Version: 2.6.9

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/ 2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

Application Development Software:
- Moxa Linux API Library for device control
- Linux Tool Chain: Gcc, Glibc, GDB

µClinux

Kernel Version: 2.6.19

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: msh, busybox, tinylogin, telnet, ftp

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

telnetd: Telnet Server daemon

inetd: TCP server manager program

ftpd: FTP server daemon

boa: Web server daemon

Application Development Software:
- Moxa Linux API Library for device control
- Linux Tool Chain:
- Arm-elf-gcc: C/C++ PC Cross Compiler
- µClibc: POSIX Standard Library

Ordering Information

Available Models

UC-7110-LX: Mini RISC-based embedded computer with 2 serial ports, dual LANs, µClinux OS, -10 to 60°C operating temperature

UC-7112-LX: Mini RISC-based embedded computer with 2 serial ports, dual LANs, SD, µClinux 2.6 OS, -10 to 60°C operating temperature

UC-7112-LX Plus: Mini RISC-based embedded computer with 2 serial ports, dual LANs, SD, Linux 2.6 OS, -10 to 60°C operating temperature

UC-7110-T-LX: Mini RISC-based embedded computer with 2 serial ports, dual LANs, µClinux OS, -40 to 75°C operating temperature

Package Checklist

- UC-7110 or UC-7112 computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adaptor (includes terminal block to power jack converter)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

UC-7101 Series

Mini RISC-based ready-to-run computer with 1 serial port, LAN, SD, µClinux

- MOXA ART ARM9 32-bit 192 MHz processor
- 16 MB RAM and 8 MB Flash ROM
- One 10/100 Mbps Ethernet port for network redundancy
- One software-selectable RS-232/422/485 port
- Select any baudrate from 50 bps to 921.6 Kbps
- SD socket for storage expansion
- Built-in real-time clock (RTC), buzzer, watchdog timer (WDT)
- Pre-installed µClinux Kernel 2.6 platform
- -40 to 75°C wide temperature model available
- DIN-Rail or wall mountable
- Robust fanless design

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

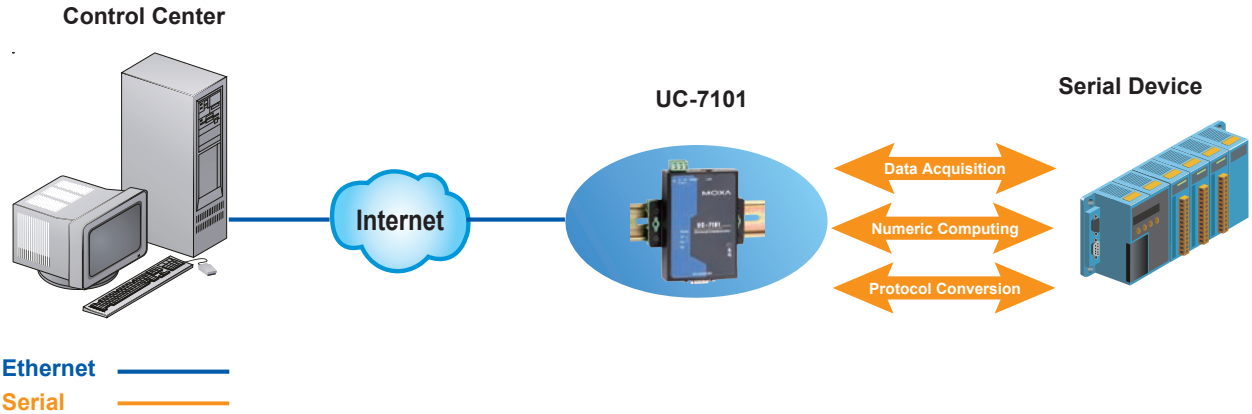
The UC-7101 may be Moxa's smallest RISC-based communication platform for embedded applications, but it is also one of the most powerful. The computer comes with one RS-232/422/485 serial port and a 10/100 Mbps Ethernet LAN port to provide users with a versatile platform for industrial communication and embedded computing.

The UC-7101 embedded computer uses the MOXA ART ARM9 192 MHz RISC CPU, which provides a powerful computing engine and communication functions, but without generating too much heat. The built-in 8 MB NOR Flash ROM and 16 MB SDRAM give users plenty of storage capacity, and the SD socket provides greater flexibility for running a variety of applications. The LAN port built into the ARM9 CPU allows the UC-7101 computer to be used as a communication platform for basic data acquisition and protocol conversion applications, and the computer's RS-232/422/485 serial port allows you to connect one serial device for data acquisition applications.

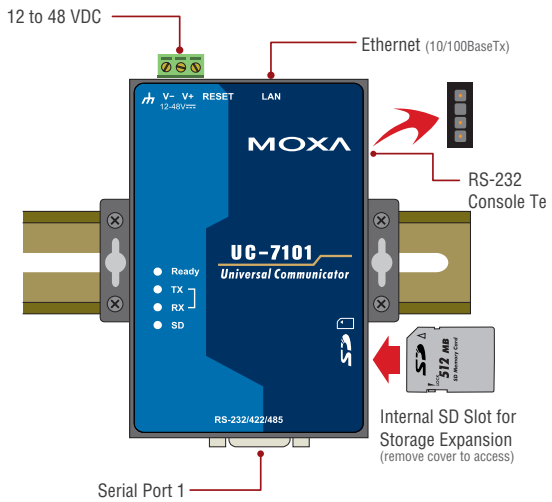
The UC-7101 comes with the µClinux operating system pre-installed. Software written for desktop PCs is easily ported to the UC-7101 computer with a GNU cross complier, so that you will not need to spend time modifying existing software code.

The wide temperature model of the UC-7101 supports an operating temperature from -40 to 75°C, making it suitable for any harsh environment. The combination of excellent features makes the UC-7101 embedded computer an ideal solution for a variety of industrial automation applications.

Typical Application



Appearance



Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit 192 MHz processor

OS (pre-installed): µClinux (based on Linux Kernel 2.6)

DRAM: 16 MB

Flash: 8 MB

Storage

Storage Expansion: SD slot

Ethernet Interface

LAN: auto-sensing 10/100 Mbps port (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 1 RS-232/422/485 port, software-selectable (DB9 male)

ESD Protection: 15 KV ESD for all signals

Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

LEDs

System: Ready

LAN: 10M/Link x 1, 100M/Link x 1 (located on RJ45 connector)

Serial: TxD x 1, RxD x 1

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: Aluminum (1 mm)

Weight: 130 g

Dimensions: 67 x 22 x 100.4 mm (2.64 x 0.87 x 3.95 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Anti-Vibration: 1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 min 17 sec per axis

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 4.5 W
- 170 mA @ 24 VDC
- 340 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Safety:
LVD: EN60950-1
UL/cUL: UL60950, CAN/CSA-C22.2 No. 60950-00

Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

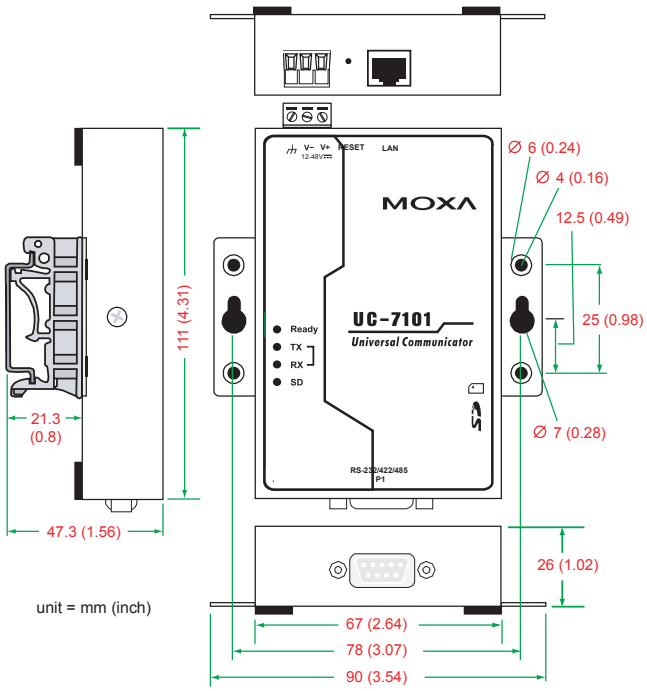
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Dimensions



Software Specifications

µCLinux

Kernel Version: 2.6.19

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash) for kernel, root file system (read only), and user directory (read/write)

System Utilities: msh, busybox, tinylogin, telnet, ftp

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

telnetd: Telnet server daemon

inetd: TCP server manager program

ftpd: FTP server daemon

boa: Web server daemon

Application Development Software:
- Moxa Linux API Library
- Linux Tool Chain:
- Arm-elf-gcc: C/C++ PC cross compiler
- µClibc: POSIX standard library

Device Drivers: UART, RTC, buzzer, SD card

Ordering Information

Available Models

UC-7101-LX: Mini RISC-based embedded computer with 1 serial port, LAN, µClinux OS, -10 to 60°C operating temperature

UC-7101-T-LX: Mini RISC-based embedded computer with 1 serial port, LAN, µClinux OS, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail

Package Checklist

- UC-7101 computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-150: 4-pin pin header to DB9 female console port cable, 150 cm
- Universal power adaptor (including terminal block to power jack converter)
- Universal power adaptor
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

DA-681 Series

x86-based rackmount embedded computer with 4 isolated RS-232 and 8 isolated RS-485 ports, 6 LANs, VGA, CompactFlash, USB

- Intel Celeron M 1 GHz processor with 400 MHz FSB
- 1 x 200-pin DDR2 SODIMM socket, supporting DDR2 400 up to 1 GB (512 MB built-in)
- Six 10/100 Mbps Ethernet ports
- 1 CompactFlash socket, 1 IDE ATA-150 connector for storage expansion
- USB 2.0 ports for high speed peripherals
- 4 isolated RS-232 and 8 isolated RS-485 ports
- Serial port speed from 50 to 921.6 Kbps, supporting nonstandard baudrates
- Embedded Linux, WinCE 6.0, or WinXPe platform
- 19-inch rackmount model, 1U height
- Dual 100/240 VAC/VDC power input (single power and dual power models available)
- Fanless Design

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

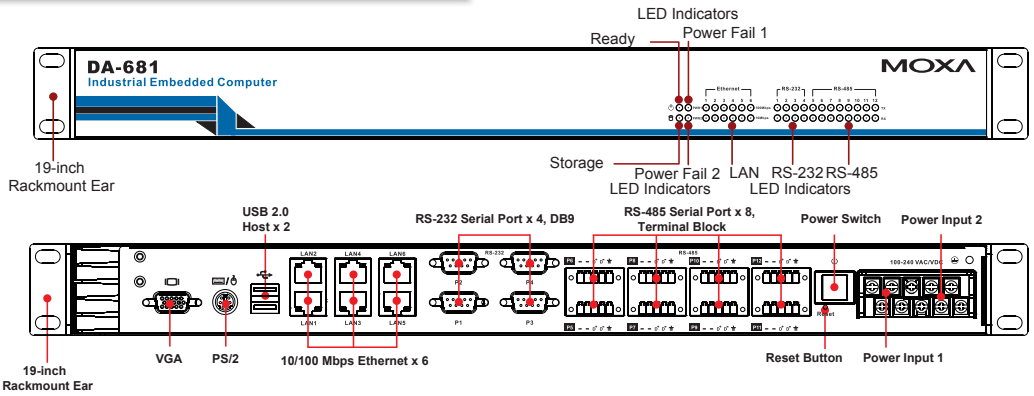
Overview

The DA-681 computer is based on the Intel x86 processor and supports VGA, 6 Ethernet ports, 4 RS-232 and 8 RS-485 serial ports with optical isolation, CompactFlash, and USB. The DA-681 comes in a standard 19-inch, 1U high form factor, making it an ideal platform for industrial applications.

With its robust design, the DA-681 is suitable for industrial automation applications that require standard 19-inch rackmount solutions, such as power automation, transportation, and oil and gas. Another plus is that the serial ports come with 2 KV optical isolation protection to guarantee communication reliability in harsh industrial environments.

The DA-681 runs Linux, WinCE 6.0, or Windows XP Embedded (pre-installed), providing a friendly environment for developing sophisticated application software. The great software support that Moxa provides makes the programmer's job easier, and helps programmers develop bug-free code quickly and at a lower cost.

Appearance



Hardware Specifications

Computer

CPU: Intel Celeron M 1 GHz processor

OS (pre-installed): WinCE 6.0, Windows XP Embedded SP3, Linux 2.6

System Chipset: Intel 910GMLE + ICH6M chipset

BIOS: 4 mega-bit Flash BIOS, PCI Plug & Play, ACPI function support

FSB: 400/533 MHz

System Memory: 1 x 200-pin DDR2 SODIMM socket supporting DDR2 400; up to 1 GB max. (512 MB built-in)

USB: USB 2.0 compliant hosts x 2, Type A connector, supports system boot up

Storage

Built-in: 1 GB SSD (DOM) onboard to store OS via IDE interface

Storage Expansion: CompactFlash socket

HDD Support: SATA connector for HDD expansion

Other Peripherals

KB/MS: 1 PS/2 interface, supports standard PS/2 keyboard and PS/2 mouse

Display

Graphics Controller: Integrated graphics with built-in Intel 910GME, and built-in Intel extreme Graphics 2 technology

Display Memory: Dynamic video memory (shares up to 32 MB of system memory)

Display Interface: CRT Interface for VGA output (DB15 female connector)

Resolution: CRT display mode with pixel resolution up to 2048 x 1536 at 75 Hz

Ethernet Interface

LAN: 6 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards:
- 4 RS-232 ports (DB9 male)
- 8 RS-485 ports (terminal block)

ESD Protection: 15 KV for all signals

Isolation: 2 KV digital isolation

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-485-2w: Data+, Data-, GND

LEDs

Sytem: Power x 1, Storage x 1

LAN: 10M x 6, 100M x 6

Serial:
RS-232: 4 x Tx, 4 x Rx
RS-485: 8 x Tx, 8 x Rx

Power Failure: LED x 2 (dual power models)

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 4.5 kg

Dimensions: 440 x 315 x 45 mm (19-inch 1U height)

Mounting: Standard 19-inch rackmount

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 80°C (-4 to 176°F)

Anti-vibration: 7 mm (2-9 Hz), 20 m/s2 (9-200 Hz), 15 m/s2 (200-500 Hz) @ IEC-61850-3, IEC 60870-2-2/Cm/(3M6)/(4M6), sine wave, 2-500 Hz, 1 Oct/min, 10 cycles, 2 hrs 40 mins per axis

Anti-shock: 300 m/s2 @ IEC-61850-3, IEC 60870-2-2/Cm/(3M6)/(4M6), half sine wave, 11 ms

Power Requirements

Input Voltage: Single or dual inputs, 100 to 240 VAC/VDC auto-ranging, 47 to 63 Hz, terminal block

Power Consumption: 26 W

Regulatory Approvals

EMC: CE (EN55022, EN61000-3-2, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class), CCC (GB9254, GB 17625.1)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)

Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock) with battery lithium backup

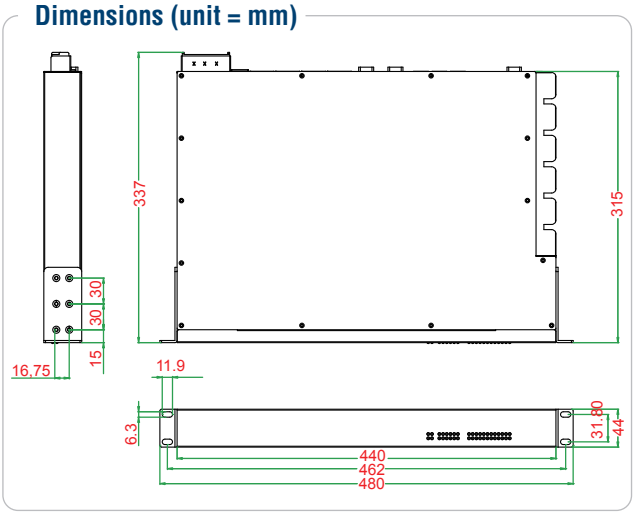
Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Software Specifications

Linux

Distribution: Debian Etch 4.0

Kernel Version: 2.6.18

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, PPP, PPPoE

File System: EXT2 (1G DOM)

System Utilities: bash, busybox, login, telnet, ftp, ssh, openbsd-inetd, apt, apt-utils, dpkg, grub, udev

telnetd: telnet Server daemon

ftpd: FTP server daemon

sshd: secure shell server

Apache: web server daemon, supporting PHP and XML

OpenVPN: virtual private network service manager

iptables: Firewall service manager

NAT: Network Address Translation

pppd: dial in/out over serial port daemon & PPPoE

pppoe: PPP over ethernet

tftp/tftpd: Trivial file transfer protocol client/server

snmpd: snmpd agent daemon

usbmount: supports USB PnP

DHCP Client: dhcp3-client

cron: to manage regular background processing

grep: NU grep, egrep, and fgrep

minicom: friendly serial communication program

watchdog: software watchdog

inetd: TCP server manager program

Application Development Environment: GNU Make 3.8.1 (GNU make utility to maintain groups of programs)

Automatic configuration script builder: autoconf 2.13

gcc: GNU C compiler

g++: GNU C++ compiler

libc6-dev: GNU C library (development libraries and headers)

Perl: Pratical Extraction and Report Language

Vim: Vi IMproved (enhanced vi editor)

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

File Server: Enables clients to access files and other resources over the network (Microsoft® Wincows® CE).

Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

Dial-up Networking Service: RAS client API and PPP, supporting Extensible Authentication Protocol (EAP) and RAS scripting.

Watchdog Service: CPU Hardware function to reset CPU in a user specified time interval (triggered by calling a MOXA library function).

Application Development Software:

- Moxa WinCE 6.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0 SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Windows XP Embedded

System Utilities: Windows command shell, Telnet, ftp, web-based administration manager, Wireless Zero Configuration

File System: NTFS

Protocol Stack: DHCP, IPv4, DNS, IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, FTP, SMTP, PPPoE, PPTP, NetBIOS

Telnet Server: Allows users to connect to Telnet servers from remote computers.

IIS Web Server: Allows you to create and manage Web sites.

Terminal Server: Microsoft Terminal Server client application (mstsc.exe).

COM+ Services: The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).

Computer Browser Service: Computer browsing functionality exposed by Windows through Microsoft Networking. Allows a client machine to browse its network neighborhood for available computers exposing file and print sharing services.

Disk Management Services: Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other changes in the storage subsystem.

Remote Registry Service: Enables remote users to modify registry settings on this computer.

Application Development Software:

- Microsoft .Net Framework 2.0 with service pack 2 (CLR and the .NET Framework class library)
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL),ASP.NET 2.0
- Certificate Request Client & Certificate
- Autoenrollment (CLR and the .NET Framework class library)
- COM APIs
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow and Direct show filters
- Distributed Transaction Coordinator (MSDTC)
- Enhanced Write Filter (Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage)
- Event Log, Internet Explorer
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- Registry Editor
- RPC
- Smart Card Cryptographic Service Providers
- USB 2.0 core drivers compliant with USB .95 or 1.0
- Windows API, Media Player 10, Script Engines, and WMI

Ordering Information

Available Models

DA-681-I-SP-CE: x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Single Power, WinCE 6.0

DA-681-I-SP-XPE: x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Single Power, WinXPe SP2

DA-681-I-SP-LX: x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Single Power, Linux 2.6

DA-681-I-DP-CE: x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Dual Power, WinCE 6.0

DA-681-I-DP-XPE: x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Dual Power, WinXPe SP2

DA-681-I-DP-LX: x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Dual Power, Linux 2.6

Package Checklist

- DA-681 computer
- Ethernet Cable: RJ45 to RJ45 cross-over cable, 100 cm
- Quick Installation Guide (printed)
- Document and Software CD or DVD
- Product Warranty Statement

DA-682 Series

x86-based rackmount computers with VGA, 4 Gigabit Ethernet ports, 2 peripheral expansion slots, CompactFlash, USB

TAIWAN EXCELLENCE 2009

- Intel Celeron M 1 GHz processor with 400 MHz FSB
- Built-in DDR2 SDRAM and industrial flash disk module
- Quad Gigabit Ethernet ports for network redundancy
- Software selectable RS-232/422/485 with 2 KV isolation protection
- PCI expansion slots for inserting expansion modules
- 1 CompactFlash socket for storage expansion
- USB 2.0 ports for high speed peripherals, supporting system bootup
- 19-inch rackmount, 2U high form factor
- 100/240 VAC/VDC power inputs
- Ready-to-Run Linux, WinCE 6.0, or Windows XP Embedded platform
- Fanless design

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The DA-682 computers are based on the Intel x86 processor and support VGA, 4 Gigabit Ethernet ports, 8 RS-232/422/485 serial ports with optical isolation, CompactFlash, and USB. The DA-682 comes in a standard 19-inch, 2U high form factor.

With their robust design, the DA-682 computers are suitable for industrial automation applications that require standard 19-inch rackmount solutions, such as power automation, transportation, and oil and gas. Another plus is that the serial ports come with 2 KV optical isolation protection to guarantee communication reliability in harsh industrial environments.

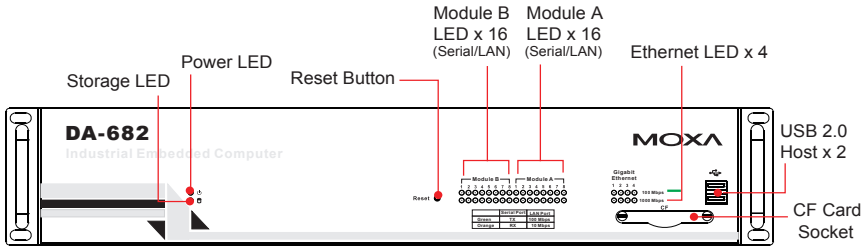
The DA-682 computers run Linux, WinCE 6.0, or Windows XP Embedded (pre-installed), providing a friendly environment for developing sophisticated application software. The great software support that Moxa provides makes the programmer's job easier, and helps programmers develop bug-free code quickly and at a lower cost.

The DA-682 comes with 2 PCI slots for inserting expansion modules. Moxa provides a variety of communication modules, including an 8-port RS-232/422/485 module, a 4-port 10/100 Mbps LAN module, and a universal PCI expansion module. The friendly design gives users the advantage of being able to swap out modules quickly and easily.

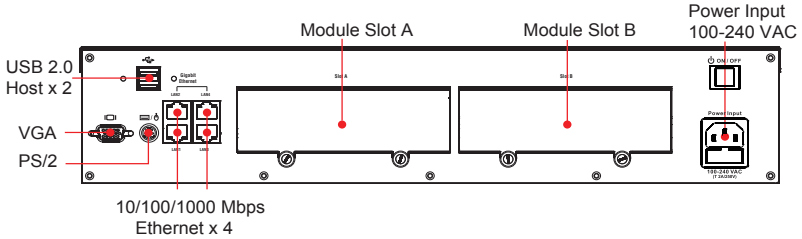
These features make the DA-682 an ideal solution for use with a wide array of industrial automation applications.

Appearance

Front View

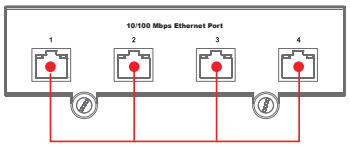


Rear View



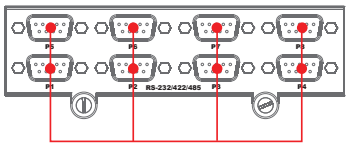
Expansion Modules

DA-LN04-RJ



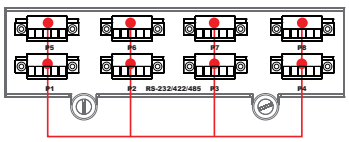
10/100 Mbps
Ethernet x 4

DA-SP08-DB
DA-SP08-I-DB



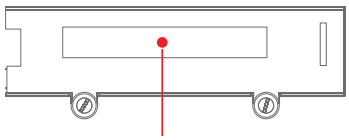
RS-232/422/485
Serial Port x 8

DA-SP08-I-TB



RS-232/422/485
Serial Port x 8

DA-UPCI-DK



Universal PCI Expansion Slot

Hardware Specifications

Computer

CPU: Intel Celeron M 1 GHz processor

OS (pre-installed): Linux, WinCE 6.0, or Windows XP Embedded SP2

System Chipset: Intel 915GME + ICH6M chipset

BIOS: 4 mega-bit Flash BIOS, PCI Plug & Play, ACPI function support

FSB: 400/533 MHz

System Memory: 1 x 200-pin DDR2 SODIMM socket supporting DDR2 400/533; up to 1 GB max. (512 MB for WinXPe/Linux, 256 MB for WinCE 6.0)

Expansion Bus: PC/104-Plus onboard

USB: USB 2.0 compliant hosts x 4, Type A connector, supports system boot up

Storage

Built-in: 256 MB (CE) or 1 GB (WinXPe/Linux) industrial DOM for OS

Storage Expansion: CompactFlash socket

Other Peripherals

KB/MS: 1 PS/2 interface, supports standard PS/2 keyboard and PS/2 mouse

Display

Graphics Controller: Integrated graphics with built-in Intel 915GME, and built-in Intel extreme Graphics 2 technology

Display Memory: Dynamic video memory (shares up to 32 MB of system memory)

Display Interface: CRT Interface for VGA output (DB15 female connector)

Resolution: CRT display mode with pixel resolution up to 2548 x 1536 at 75 Hz

Ethernet Interface

LAN: 4 auto-sensing 10/100/1000 Mbps Gigabit ports (Realtek RTL8110SC controller)

Magnetic Isolation Protection: 1.5 KV built-in

LEDs

Sytem: Power, Storage

Gigabit LAN: 100M x 4, 1000M x 4

LAN: 10/100M mode

Serial: TX/RX

Communication: Module A x 16, Module B x16

Switches and Buttons

Power Switch: on/off (on rear panel)

Reset Button: To reset system hardware (on front panel)

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 7 kg

Dimensions: 440 x 253 x 90 mm (17.32 x 9.96 x 3.54 in) (without rackmount ears)

Mounting: Standard 19-inch rackmount

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 80°C (-4 to 176°F)

Anti-Vibration: 2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-Shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 100 to 240 VAC/VDC auto-ranging (47 to 63 Hz for AC input)

Power Consumption: 30 W (full loading)

Regulatory Approvals

EMC: CE (EN61000-6-4, EN61000-3-2, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock) with battery lithium backup

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

DA-SP08-DB/DA-SP08-I-DB/TB (module with 8 serial ports)

Serial Interface

Serial Standards: 8 RS-232/422/485 ports, software-selectable (DB9 male or terminal block connector)

ESD Protection: 15 KV for all signals

Isolation: 2 KV digital isolation

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

DA-LN04-RJ (module with 4 LAN ports)

Ethernet Interface

LAN: Auto-sensing 10/100 Mbps Ethernet x 4, RJ45 connectors

Magnetic Isolation Protection: 1.5 KV built-in

DA-UPCI-DK (module with 1 Universal PCI expansion slot)

Universal PCI Expansion Adatpor

PCI Slots: 1

Interface Bus: 32-bit Universal PCI (3.3 V and 5 V)

Software Specifications

Linux

Distribution: Debian Etch 4.0 r2

Kernel Version: 2.6.18

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, PPP, PPPoE

File System: EXT2, JFFS2 (1G DOM)

System Utilities: bash, busybox, login, telnet, ftp, ssh, openbsd-inetd, apt, apt-utils, dpkg, grub, udev

telnetd: telnet Server daemon

ftpd: FTP server daemon

sshd: secure shell server

Apache: web server daemon, supporting PHP and XML

Openvpn: virtual private network service manager

iptables: Firewall service manager

NAT: Network Address Translation

pppd: dial in/out over serial port daemon & PPPoE

pppoe: PPP over ethernet

tftp/tftpd: Trivial file transfer protocol client/server

snmpd: snmpd agent daemon

usbmount: support USB PnP

DHCP Client: dhcp3-client

cron: management of regular background processing

grep: NU grep, egrep and fgrep

minicom: friendly serial communication program

watchdog: software watchdog

inetd: TCP server manager program

Application Development Environment: GNU Make 3.8.1 (GNU make utility to maintain groups of programs)

Automatic configuration script builder: autoconf 2.13

gcc: GNU C compiler

g++: GNU C++ compiler

libc6-dev: GNU C Library (development libraries and headers)

Perl: Pratical Extraction and Report Language

Vim: Vi IMproved - enhanced vi editor

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

File Server: Enables clients to access files and other resources over the network (Microsoft® Wincows® CE).

Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

Dial-up Networking Service: RAS client API and PPP, supporting Extensible Authentication Protocol (EAP) and RAS scripting.

Watchdog Service: CPU Hardware function to reset CPU in a user specified time interval (triggered by calling a MOXA library function).

Application Development Environment:
- Moxa WinCE 6.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0 SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Windows XP Embedded

System Utilities: Windows command shell, Telnet, ftp, web-based administration manager, Wireless Zero Configuration

File System: NTFS

Protocol Stack: DHCP, IPv4, DNS, IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, FTP, SMTP, PPPoE, PPTP, NetBIOS

Telnet Server: Allows users to connect to Telnet servers from remote computers.

IIS Web Server: Allows you to create and manage Web sites.

Terminal Server: Microsoft Terminal Server client application (mstsc.exe).

COM+ Services: The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).

Computer Browser Service: Computer browsing functionality exposed by Windows through Microsoft Networking. Allows a client machine to browse its network neighborhood for available computers exposing file and print sharing services.

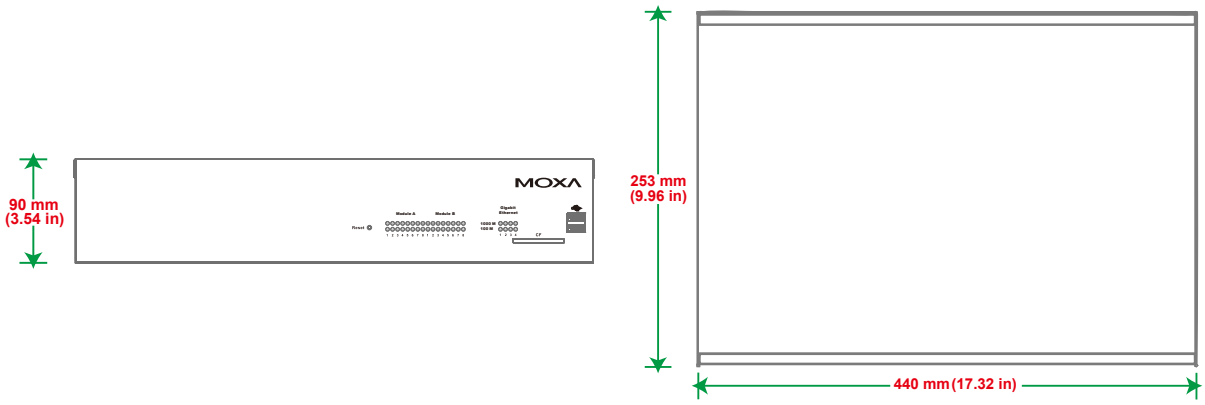
Disk Management Services: Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other changes in the storage subsystem.

Remote Registry Service: Enables remote users to modify registry settings on this computer.

Application Development Environment:

- Microsoft .Net Framework 2.0 with service pack 2 (CLR and the .NET Framework class library)
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL),ASP.NET 2.0
- Certificate Request Client & Certificate
- Autoenrollment (CLR and the .NET Framework class library)
- COM APIs
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow and Direct show filters
- Distributed Transaction Coordinator (MSDTC)
- Enhanced Write Filter (Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage)
- Event Log, Internet Explorer
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- Registry Editor
- RPC
- Smart Card Cryptographic Service Providers
- USB 2.0 core drivers compliant with USB .95 or 1.0
- Windows API, Media Player 10, Script Engines, and WMI

Dimensions



Ordering Information

Available Models

DA-682-CE: x86 rackmount computer with VGA, 4 Gigabit Ethernet ports, 2 PCI slots, CompactFlash, USB, WinCE 6.0

DA-682-XPE: x86 rackmount computer with VGA, 4 Gigabit Ethernet ports, 2 PCI slots, CompactFlash, USB, WinXPe

DA-682-LX: x86 rackmount computer with VGA, 4 Gigabit Ethernet ports, 2 PCI slots, CompactFlash, USB, Linux

Expansion Modules (can be purchased separately)

DA-SP08-I-DB: 8-port RS-232/422/485 serial module with DB9 connector and digital isolation

DA-SP08-DB: 8-port RS-232/422/485 serial module with DB9 connector

DA-SP08-I-TB: 8-port RS-232/422/485 serial module with terminal block connector and digital isolation

DA-LN04-RJ: 4-port 10/100 Mbps LAN module

DA-UPCI-DK: Universal PCI development kit

Package Checklist

- DA-682 embedded computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- AC power cable
- Document and Software CD or DVD
- Quick Installation Guide (printed)
- Warranty Card

DA-660/661/662/662-I

RISC-based 19-inch rackmount data acquisition computers with 8 or 16 serial ports, Ethernet/fiber LAN, PCMCIA, CompactFlash, USB

- Intel XScale IXP422/425 266/533 MHz processor
- 128 MB RAM onboard, 32 MB flash
- 8 or 16 software-selectable RS-232/422/485 serial ports
- 15 KV ESD protection for all serial signals
- Dual or quad 10/100 Mbps Ethernet ports
- PCMCIA CardBus for WLAN 802.11b/g wireless network supported
- CompactFlash and USB slots for storage expansion supported
- Standard 19-inch rackmount installation, 1U height
- Wide range of power input voltages from 100 to 240 V, both AC and DC
- LCM display and keypad for HMI
- Ready-to-Run Linux, Windows CE 5.0 OS platform
- Robust, fanless design

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

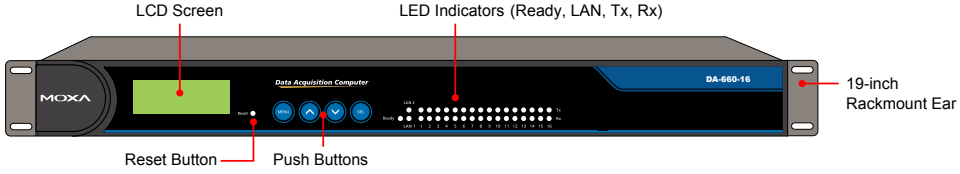
Overview

The DA-660/661/662/662-I embedded computers come with 8 or 16 software-selectable RS-232/422/485 serial ports, making them suitable for a variety of industrial applications. Models are available with either 2 or 4 10/100 Mbps Ethernet ports. Most models come with a PCMCIA socket to provide 802.11 b/g wireless LAN card expansion, and a CompactFlash socket and USB ports to make it easy to add additional memory. The computers are designed with a standard 19-inch, rugged 1U rackmount case, and are embedded with a 100-240V AC/DC power input. This combination of features gives users a robust and reliable ready-to-run solution for applications such as data acquisition and power substations.

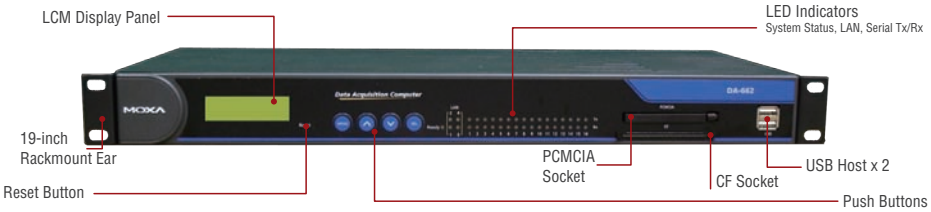
Model Name	RS-232/422/485 Serial Ports		Wired LAN		Wireless LAN	Memory Expansion	
	No. of Ports	Digital Isolation	10/100M	100BaseFX multi-mode	PCMCIA Socket	CompactFlash Socket	USB
DA-660	8 or 16	---	2 ports	---	---	---	---
DA-661	16	---	2 ports	---	√	√	2 ports
DA-662	16	---	4 ports	---	√	√	2 ports
DA-662-I	16	2 KV per port	4 ports	---	√	√	2 ports

Appearance

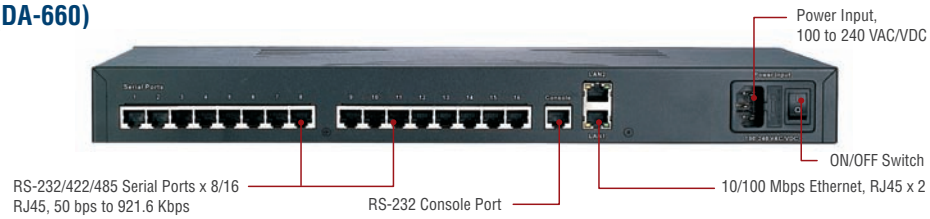
Front View (DA-660)



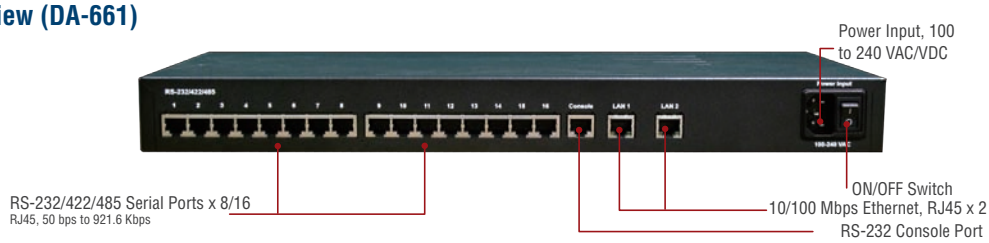
Front View (DA-661/662/662-I)



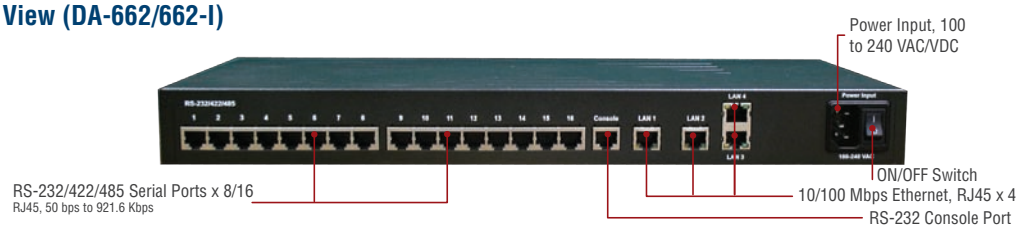
Rear View (DA-660)



Rear View (DA-661)



Rear View (DA-662/662-I)



Hardware Specifications

Computer

CPU:
DA-660: Intel XScale IXP422 266 MHz
DA-661/662/662-I: IXP425 533 MHz

OS (pre-installed): Embedded Linux or Windows CE 5.0

DRAM: 128 MB onboard (256 MB for ODM)

Flash: 32 MB onboard

PCMCIA: Cardbus card and 16-bit PCMCIA 2.1 or JEIDA 4.2 card (DA-661/662/662-I only)

Storage

Storage Expansion: CompactFlash Socket (DA-661/662/662-I only)

Ethernet Interface

LAN: 2 or 4 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 8 or 16 RS-232/422/485 ports, software selectable (8-pin RJ45)

ESD Protection: 15 KV for all signals

Isolation: 2 KV digital isolation (DA-662-I only)

Console Port: RS-232 (all signals), RJ45 connector, supports PPP

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

LEDs

System: OS Ready

LAN:
DA-660/661: 10/100M x 2
DA-662/662-I: 10/100M x 4

Serial: TxD, RxD (8 or 16 of each)

Mini Screen with Push Buttons

LCD Panel: Liquid Crystal Display on the case, 2 x 16 text mode

Push Buttons: Four membrane buttons for convenient on-site configuration

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight:
DA-660/661/662: 2600 g
DA-662-I: 2940 g

Dimensions:
DA-660/661/662:
Without ears: 440 x 45 x 198 mm (17.32 x 1.77 x 7.80 in)
With ears: 480 x 45 x 198 mm (18.90 x 1.77 x 7.80 in)
DA-662-I:
Without ears: 440 x 45 x 228 mm (17.32 x 1.77 x 8.98 in)
With ears: 480 x 45 x 224 mm (18.90 x 1.77 x 8.82 in)

Mounting: Standard 19-inch rackkmount

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 80°C (-4 to 176°F)

Anti-vibration: 1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 Cycle, 13 mins 17 sec per axis

Power Requirements

Input Voltage: 100 to 240 VAC/VDC auto ranging (47 to 63 Hz for AC input)

Power Consumption:
DA-660: 12 W
DA-661/662/662-I: 20 W

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

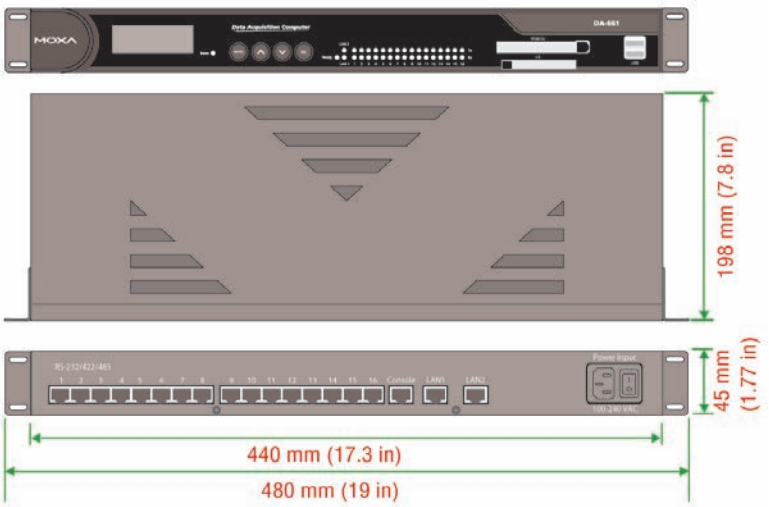
Warranty

Warranty Period: 5 years

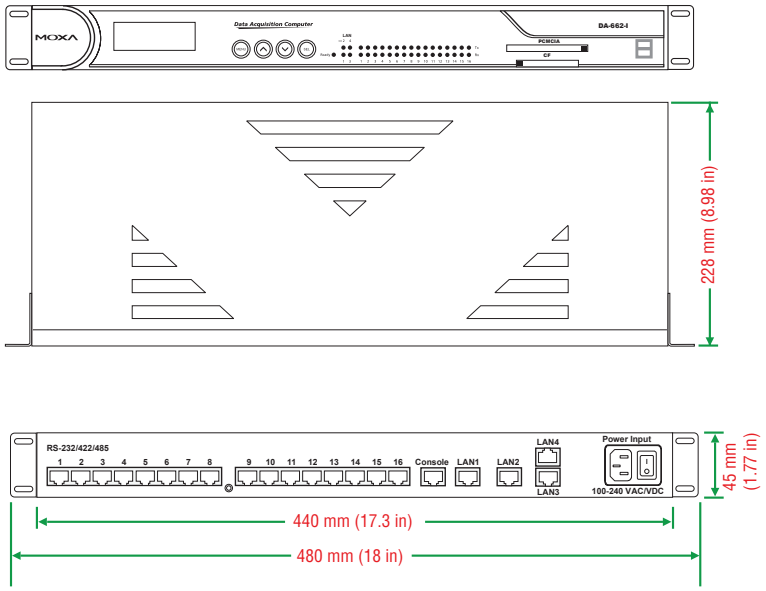
Details: See www.moxa.com/warranty

Dimensions

DA-660/661/662



DA-662-I



Software Specifications

Linux

Kernel Version:
DA-660: 2.4.18
DA-661/662/662-I: 2.6.10

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/ 2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

Application Development Software:
• Moxa Linux API Library for device control
• Linux Tool Chain: Gcc, Glibc, GDB

Windows Embedded CE 5.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client (DA-662-I only).

FTP Server: Used for transferring files to and from remote computer systems over a network.

File Server: Used to enable clients to access files and other resources over the network (DA-662-I only).

Web Server (httpd): WinCE IIS, including ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/ SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

Dial-up Networking Service: RAS client API and PPP, supporting Extensible Authentication Protocol (EAP) and RAS scripting.

Application Development Software:
• Moxa WinCE 5.0 SDK
• C Libraries and Run-times
• Component Services (COM and DCOM)
• Microsoft Foundation Classes (MFC)
• Microsoft® .NET Compact Framework 2.0 SP2
• XML, including DOM, XQL, XPATH, XSLT, SAX2
• SOAP Toolkit
• Winsock 2.2

Ordering Information

Available Models

DA-660-8-LX: RISC-based 19-inch rackmount data acquisition computer with 8 serial ports, dual LANs, Linux OS

DA-660-8-CE: RISC-based 19-inch rackmount data acquisition computer with 8 serial ports, dual LANs, WinCE 5.0 OS

DA-660-16-LX: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, dual LANs, Linux OS

DA-660-16-CE: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, dual LANs, WinCE 5.0 OS

DA-661-16-LX: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, dual LANs, PCMCIA, CompactFlash, USB, Linux OS

DA-661-16-CE: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, dual LANs, PCMCIA, CompactFlash, USB, WinCE 5.0 OS

DA-662-16-LX: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, quad LANs, PCMCIA, CompactFlash, USB, Linux OS

DA-662-16-CE: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, quad LANs, PCMCIA, CompactFlash, USB, WinCE 5.0 OS

DA-662-I-16-LX: RISC-based 19-inch rackmount data acquisition computer with 16 digitally isolated serial ports, quad LANs, PCMCIA, CompactFlash, USB, Linux 2.6

DA-662-I-16-CE: RISC-based 19-inch rackmount data acquisition computer with 16 digitally isolated serial ports, quad LANs, PCMCIA, CompactFlash, USB, WinCE 5.0

Package Checklist

- DA-660 series computer
- 19-inch rackmount kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-RJ45F9-150: 8-pin RJ45 to DB9 female console port cable, 150 cm
- CBL-RJ45M9-150: 8-pin RJ45 to DB9 male serial port cable, 150 cm
- Power Cord
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

EM-2260 Series

RISC-based embedded core modules with 4 serial ports, 8 DI/DO, dual LANs, VGA, CompactFlash, USB

- Cirrus Logic EP9315 ARM9 CPU, 200 MHz
- 128 MB RAM on-board, 32 MB flash disk
- Graphical interface for external VGA output connection
- 2 KV optically isolated RS-232/422/485 serial ports
- Dual 10/100 Mbps Ethernet for network redundancy
- 8 DI and 8 DO channels
- Supports CompactFlash and USB 2.0 hosts
- Ready-to-run WinCE 6.0 or Linux platform
- Full-function development kit for quick evaluation and application development

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

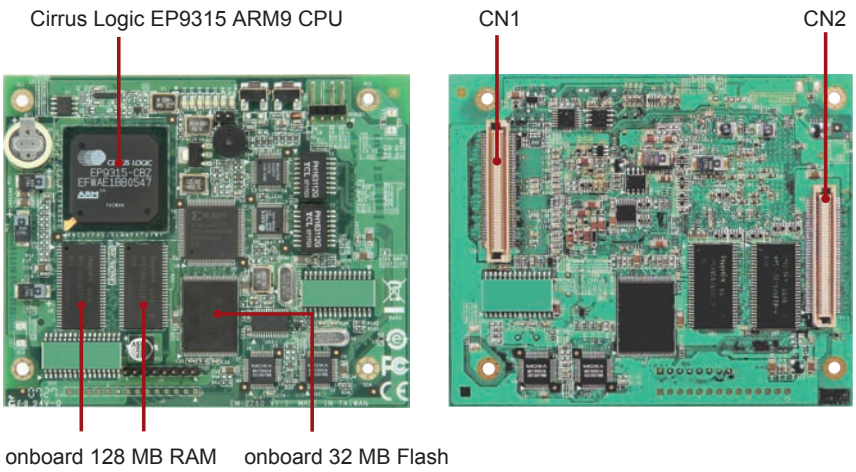
The EM-2260 embedded module features 4 RS-232/422/485 serial ports, dual Ethernet ports, an EIDE interface for designing an external storage connection, such as a CompactFlash socket and USB port signals. The module has a compact design that is easily integrated with a variety of industrial applications, including gas stations, vending machines, and ticketing machines, and offers a powerful serial communication capability for better system integration. Programmers will find the pre-installed, ready-to-run Windows CE 6.0 platform and full-function development kit a great benefit to developing software and building reliable communication bases for industrial automation applications.

The EM-2260 embedded module uses the Cirrus Logic EP9315 ARM9, 32-bit, 200 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate a lot of heat. The built-in 32 MB NOR Flash ROM and 128 MB SDRAM give you enough memory to run your application software directly on the EM-2260. With its built-in VGA output interface, the EM-2260 is suitable for use with SCADA systems in industrial applications, such as manufacturing automation, production line process monitoring, and mining automation, that require VGA and HMI features.

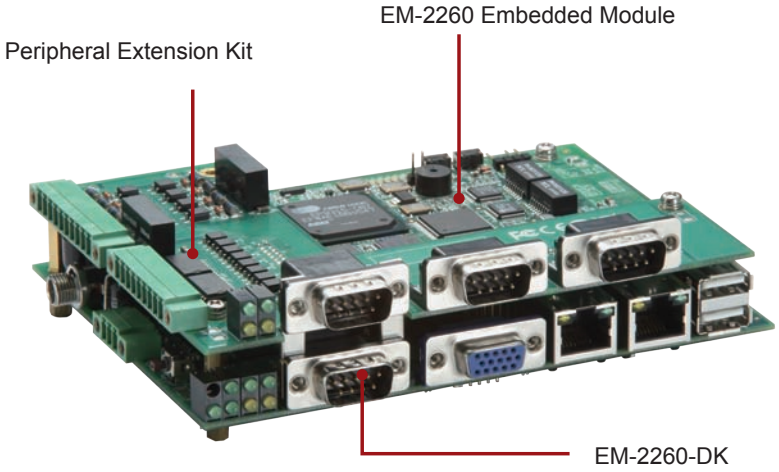
The EM-2260 comes pre-installed with either the open standard Linux OS, or the more common WinCE OS. Software written for a desktop PC can be easily ported to the EM-2260 platform by using a common compiler, without needing to modify the code, and the software you develop for your own applications can be stored in the EM-2260's flash memory.

The EM-2260 Development Kit provides users with a handy tool for first time evaluation to test the functionality of the embedded core module. It has several peripherals built-in, including RS-232/422/485 ports and digital input and output, making it suitable for developing a variety of industrial applications.

Appearance



EM-2260 Embedded Module



Hardware Specifications

Computer

CPU: Cirrus Logik EP9315 ARM9 CPU, 200 MHz

OS (pre-installed): Windows CE 6.0 or Linux

DRAM: 128 MB onboard (optional 256 MB)

Flash: 32 MB

Storage

Storage Expansion: EIDE interface for connecting up to 2 external devices

Display

Graphics Controller: EP9315 internal graphics accelerator engine with TTL graphical signal support

Display Memory: Dynamic video memory (shares system memory)

Resolution: 1024 x 768, 8 bits

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 4 RS-232/422/485 ports, software-selectable

Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output (115200, n, 8, 1)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

TTL: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

Digital Input

Input Channels: 8

Input Voltage: 3.3 V, CMOS level

Digital Output

Output Channels: 8

Digital Output Levels: 3.3 V, CMOS level

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Weight: 70 g

Dimensions: 106 x 87 mm (4.17 x 3.43 in)

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 80°C (-4 to 176°F)

Power Requirements

Input Voltage: 12 VDC

Power Consumption: 5.8 W (480 mA @ 12 VDC)

Regulatory Approvals

EMC: CE (Class A), FCC

Green Product: RoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Software Specifications

Linux

Kernel Version: 2.6.23

Protocol Stack: ARP, PPP, CHAP, PAP, IPv4, ICMP, TCP, UDP, DHCP, FTP, SNMP V1, HTTP, NTP, NFS, SMTP, SSH 1.0/2.0, SSL, Telnet, PPPoE, OpenVPN

File System: JFFS2, NFS, Ext2, Ext3, VFAT/FAT

System Utilities: bash, tinylogin, telnet, ftp, smtpclient, scp, busybox

telnetd: telnet server daemon

sshd: secure shell server

Apache: web server daemon

openvpn: virtual private network

pppd: dial in/out over serial port daemon

snmpd: snmpd agent daemon

inetd: TCP server manager program

openssl: open SSL

Linux Tool Chain:
- GCC (V3.3.2): C/C++ PC Cross Compiler
- GDB (V5.3): Source level debug server
- Blibc (V2.2.5): POSIX standard C library

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard Telnet client

FTP Server: Used for transferring files to and from remote computer systems over a network.

File Server: Microsoft® Windows® CE functionality enables clients to access files and other resources over the network.

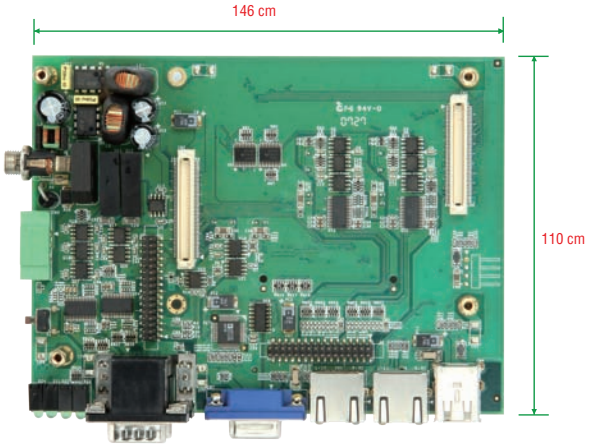
Web Server (HTTPD): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI extensions.

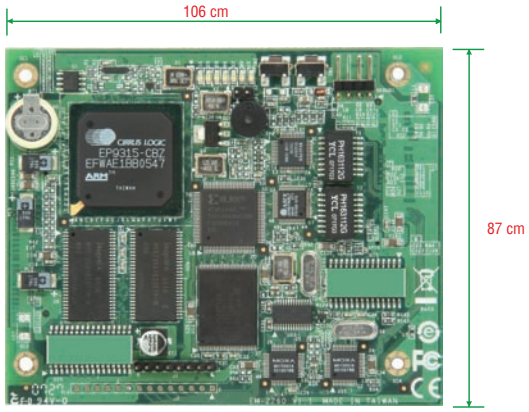
Dial-up Networking Service: RAS client API and PPP, with support for Extensible Authentication Protocol (EAP) and RAS scripting.

Watchdog Service: CPU hardware function for resetting CPU in a user specified time interval. Activated by Moxa library function.

Application Development Software:
- Moxa WinCE 6.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0 with SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX
- SOAP Toolkit
- Winsock 2.2

Dimensions





Ordering Information

Available Modules

EM-2260-CE: RISC-based embedded core module with 4 serial ports, 8 DI and 8 DO channels, dual LANs, VGA, CompactFlash, USB, WinCE 6.0 OS

EM-2260-LX: RISC-based embedded core module with 4 serial ports, 8 DI and 8 DO channels, dual LANs, VGA, CompactFlash, USB, Linux OS

Development Kits (must be purchased separately)

EM-2260-CE Development Kit: Includes the EM-2260-CE module and EM-2260-DK carrier board for testing and application development

EM-2260-LX Development Kit: Includes the EM-2260-LX module and EM-2260-DK carrier board for testing and application development

Package Checklist (modules)

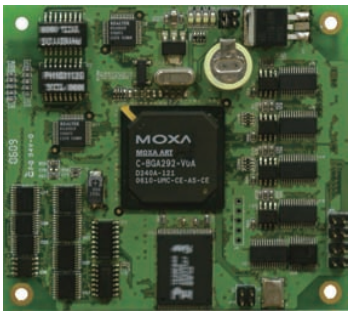
- EM-2260-CE or EM-2260-LX embedded module

Package Checklist (development kits)

- EM-2260 embedded module
- EM-2260-DK, the carrier board for the EM-2260 module
- Universal power adaptor set
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

EM-1240 Series

RISC-based ready-to-run embedded core module with 4 serial ports, dual LANs, SD, µClinux



- MOXA ART ARM9 32-bit 192 MHz processor
- 16 MB RAM, 8 MB flash on-board
- 4 software-selectable RS-232/422/485 serial ports
- Dual 10/100 Mbps Ethernet for network redundancy
- RS-232 serial console port supporting PPP
- Ready-to-run µClinux Kernel 2.6 platform
- SD signals supported for external SD socket connection
- Built-in RTC, buzzer
- 10 GPIOs reserved for system integration
- Full-function development kit for quick evaluation and application development
- -40 to 75°C wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

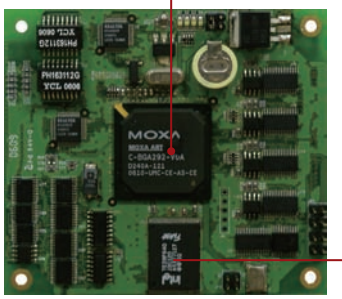
Overview

The EM-1240 embedded module features 4 RS-232/422/485 serial ports, dual Ethernet ports and an SD socket for external storage expansion. The module has a compact design that can be easily integrated with related industrial applications, such as gas stations, vending machines, and ticketing machines, and offers a powerful serial communication capability for better system integration. Programmers will find that the pre-installed, ready-to-run µClinux platform and the full-function development kit make it easy to develop software and build a reliable communication base for industrial automation applications.

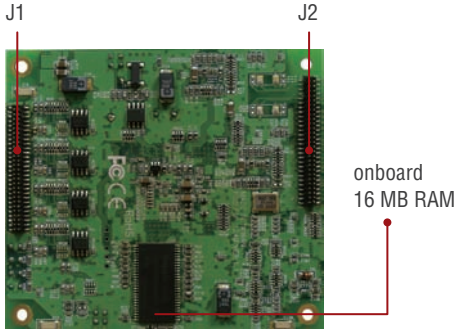
In addition, the wide temperature EM-1240-T model is also available to provide a reliable solution for any harsh environment.

Appearance

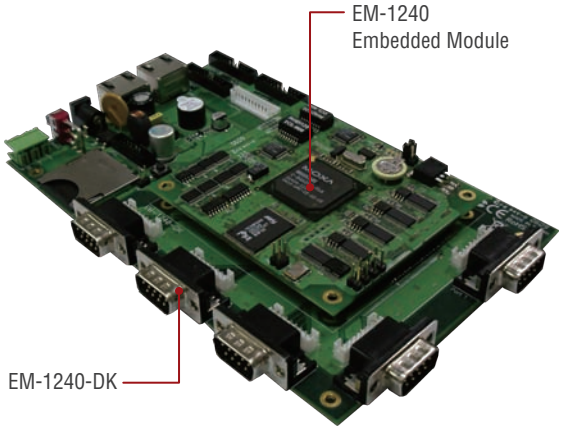
Embedded Module—Top View



Embedded Module—Bottom View



Development Kit Appearance



Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit 192 MHz processor

OS (pre-installed): Embedded µClinux (kernel 2.6.19)

DRAM: 16 MB onboard (32 MB for ODM)

Flash: 8 MB onboard (16 MB for ODM)

Storage

Storage Expansion: SD signals for external Secure Digital (SD) socket connection

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 4 RS-232/422/485 ports, software-selectable

ESD Protection: 15 KV for all signals

Console Port: RS-232 (all signals), RJ45 connector, supports PPP

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

LEDs

System: Ready

LAN: 10M/Link x 2, 100M/Link x 2

Serial: TxD x 4, RxD x 4

Physical Characteristics

Weight:
EM-1240 Module: 50 g
EM-1240 Development Kit: 200 g

Dimensions:
EM-1240 Module: 90 x 80 mm (3.54 x 3.15 in)
EM-1240 Development Kit: 177 x 115 mm (6.97 x 4.53 in)

Module Interface: Two 2 x 28 pin-headers (1.27 x 1.27 mm pitch)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 3.3 VDC

Power Consumption: 2.5 W (740 mA @ 3.3 VDC)

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty

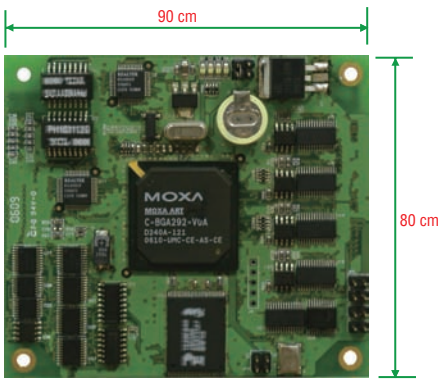
Warranty Period: 5 years

Details: See www.moxa.com/warranty

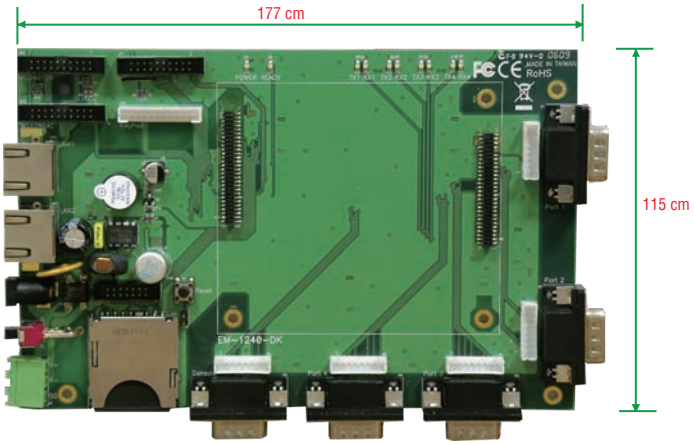
Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Dimensions

EM-1240 Embedded Module

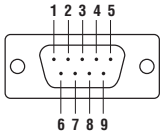


EM-1240-DK



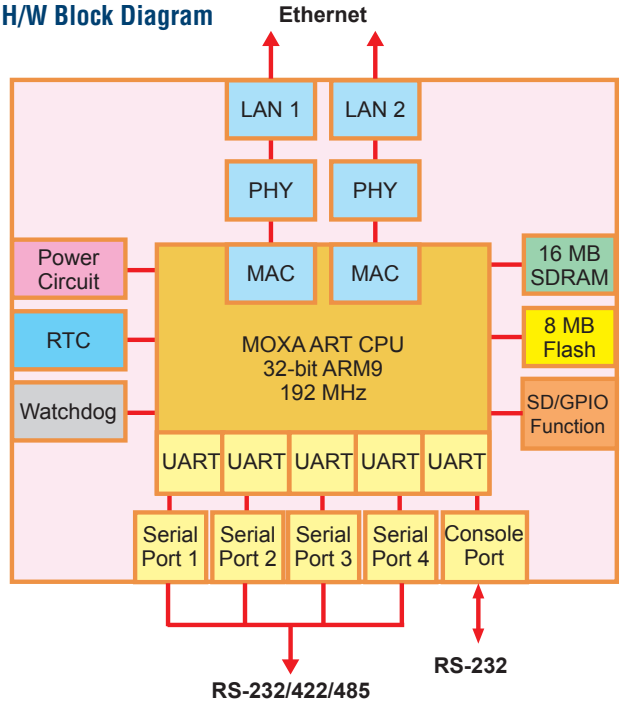
Pin Assignment

DB9 male



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

H/W Block Diagram



Software Specifications

µClinux

Kernel Version: 2.6.19

Protocol Stack: ARP, ICMP, IPV4, TCP, UDP, FTP, Telnet, SNMP V1, HTTP, CHAP, PAP, DHCP, NTP, NFS V2, SMTP, Telnet, PPP, PPPoE

File System: JFFS2, root file system (read only), and user directory (read/write)

System Utilities: msh, busybox, tinylogin, telnet, ftp

pppd: Dial in/out over serial port daemon, including PPPoE (Point-to-Point over Ethernet)

snmpd: SNMP V1 Agent daemon

telnetd: Telnet server daemon

inetd: TCP server manager program

ftpd: FTP server program

boa: Web server daemon

ntpdate: Network Time Protocol client utility

Tool Chain:

- Arm-elf-gcc: C/C++ PC Cross Compiler
- µClibc: POSIX standard C library

Ordering Information

Available Modules

EM-1240-LX: RISC-based embedded core module with 4 serial ports, dual LANs, SD, µClinux OS, -10 to 60°C operating temperature

EM-1240-T-LX: RISC-based embedded core module with 4 serial ports, dual LANs, SD, µClinux, -40 to 75°C operating temperature

Development Kits (must be purchased separately)

EM-1240 Development Kit: Includes the EM-1240-DK snap-on testing board with built-in RJ45 LAN ports and DB9 male serial ports

Package Checklist (module)

- EM-1240-LX or EM-1240-T-LX embedded module

Package Checklist (Development Kit)

- EM-1240 embedded module
- EM-1240-DK, the carrier board for the EM-1240 module
- Universal power adaptor set
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- DB9 female to terminal block adaptor
- Terminal block (300V, 15A)
- Universal power adaptor set
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

EM-1220 Series

RISC-based ready-to-run embedded core module with 2 serial ports, dual LANs, SD, µClinux

- MOXA ART ARM9 32-bit 192 MHz processor
- 16 MB RAM, 8 MB flash disk on-board
- 2 software-selectable RS-232/422/485 serial ports
- Dual 10/100 Mbps Ethernet for network redundancy
- Ready-to-run µClinux Kernel 2.6 platform
- SD signals supported for external SD socket connection
- Built-in RTC, buzzer
- 10 GPIOs reserved for system integration
- Credit card size design for easy integration at any field site
- Full-function development kit for quick evaluation and application development
- -40 to 75°C wide temperature model available

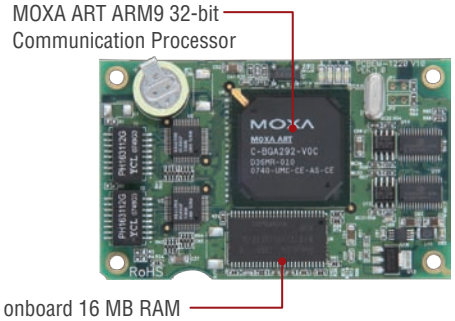
The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

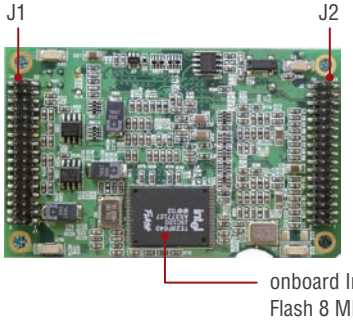
The EM-1220 embedded module features 2 RS-232/422/485 serial ports, dual Ethernet ports, and an SD socket for external storage expansion. The module has a compact design that can be easily integrated with industrial applications, such as gas stations, vending machines, and ticketing machines, and offers a powerful serial communication capability for better system integration. Programmers will find that the pre-installed, ready-to-run µClinux platform and the full-function development kit make it easy to develop software and build a reliable communication base for industrial automation applications. In addition, the "wide temperature" EM-1220-T model is also available to provide a reliable solution for any harsh environment.

Appearance

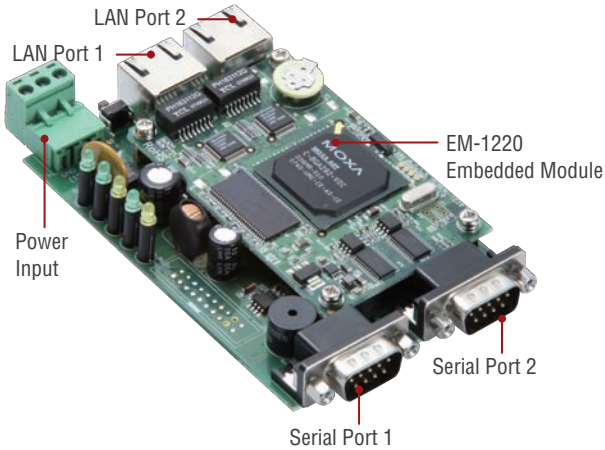
Embedded Module—Top View



Embedded Module—Bottom View



Development Kit



Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit 192 MHz processor

OS (pre-installed): Embedded µClinux (kernel 2.6.19)

DRAM: 16 MB onboard (32 MB for ODM)

Flash: 8 MB onboard (16 MB for ODM)

Storage

Storage Expansion: SD signals for external Secure Digital (SD) socket connection

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 2 RS-232/422/485 ports, software-selectable

ESD Protection: 15 KV for all signals

Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

LEDs

System: Ready

LAN: 10M/Link x 2, 100M/Link x 2

Serial: TxD x 2, RxD x 2

Physical Characteristics

Weight:
EM-1220 Module: 40 g
EM-1220 Development Kit: 120 g

Dimensions:
EM-1220 Module: 80 x 50 mm (3.15 x 1.97 in)
EM-1220 Development Kit: 117 x 70 mm (4.61 x 2.76 in)

Module Interface: Two 2 x 17 pin-headers (2.5 x 2.5 mm pitch)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 3.3 VDC

Power Consumption: 2.1 W (625 mA @ 3.3 VDC)

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

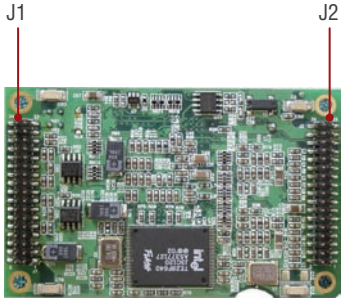
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Pin Assignment



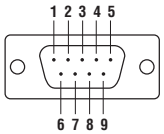
Jumper 1 (J1)

Pin No.	Signals	Pin No.	Signals
1	VCC (3.3V)	2	VCC (3.3V)
3	VCC (3.3V)	4	VCC (3.3V)
5	GND	6	GND
7	GND	8	GND
9	TxD0 (RS-232)	10	RxD0(RS-232)
11	RTS0	12	CTS0
13	DTR0	14	DSR0
15	RxD1 (RS-232)	16	DCD0
17	CTS1	18	TxD1 (RS-232)
19	DSR1	20	RTS1
21	DCD1	22	DTR1
23	Data-(A)0/ RxD-(A)0	24	Data-(A)1/ RxD-(A)1
25	Data+(B)0/ RxD+(B)0	26	Data+(B)1/ RxD+(A)1
27	Serial LED_Tx0	28	Serial LED_Rx0
29	Serial LED_Tx1	30	Serial LED_Rx1
31	TxDA(-)0	32	TxDA(-)1
33	TxDB(+)0	34	TxDB(+)1

Jumper 2 (J2)

Pin No.	Signals	Pin No.	Signals
1	Console_RxD	2	Console_TxD
3	Eth1_TxD_out+	4	GND
5	Eth1_TxD_out-	6	Eth1_RxD_in+
7	Eth1_LED_100M	8	Eth1_RxD_in-
9	Eth0_TxD_out+	10	Eth1_LED_10M
11	Eth0_TxD_out-	12	Eth0_RxD_in+
13	Eth0_LED_100M	14	Eth0_RxD_in-
15	GPIO0	16	Eth0_LED_10M
17	GPIO2	18	GPIO1
19	GPIO4	20	GPIO3
21	GPIO6	22	GPIO5
23	GPIO8	24	GPIO7
25	Buzzer	26	GPIO9
27	LED_Ready	28	SW Reset
29	SDA	30	SCL
31	GND	32	GND
33	GND	34	GND

DB9 male



PIN	RS-232	RS-422/485 -4W	RS-485-2W
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Software Specifications

µClinux

Kernel Version: 2.6.19

Protocol Stack: ARP, ICMP, IPV4, TCP, UDP, FTP, Telnet, SNMP V1, HTTP, CHAP, PAP, DHCP, NTP, NFS V2, SMTP, Telnet, PPP, PPPoE

File System: JFFS2, root file system (read only), and user directory (read/write)

System Utilities: msh, busybox, tinylogin, telnet, ftp

pppd: Dial in/out over serial port daemon, including PPPoE (Point-to-Point over Ethernet)

snmpd: SNMP V1 Agent daemon

telnetd: Telnet server daemon

inetd: TCP server manager program

ftpd: FTP server program

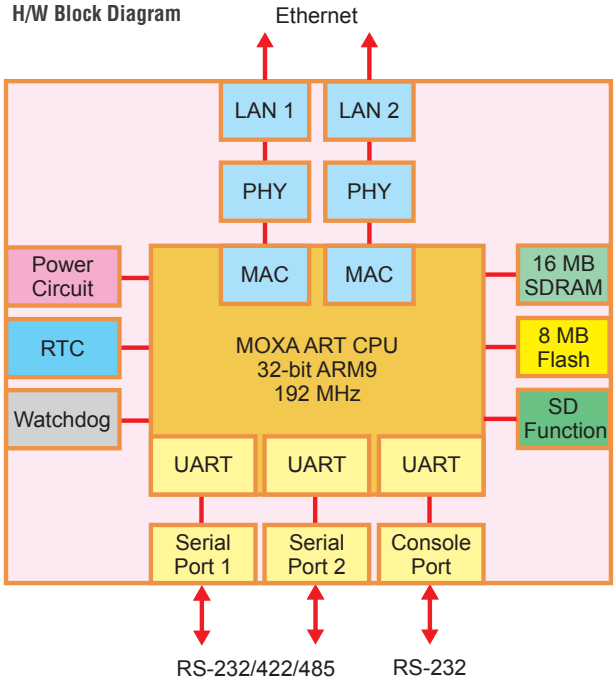
boa: Web server daemon

ntpdate: Network Time Protocol client utility

Tool Chain:

- Arm-elf-gcc: C/C++ PC Cross Compiler
- µClibc: POSIX standard C library

H/W Block Diagram



Ordering Information

Available Modules

EM-1220-LX: RISC-based embedded core module with 2 serial ports, dual LANs, SD, µClinux, -10 to 60°C operating temperature

EM-1220-T-LX: RISC-based embedded core module with 2 serial ports, dual LANs, SD, µClinux, -40 to 75°C operating temperature

Development Kits (must be purchased separately)

EM-1220 Development Kit: Includes the EM-1220-DK snap-on testing board with built-in RJ45 LAN ports and DB9 male serial ports

Package Checklist (module)

- EM-1220-LX or EM-1220-T-LX embedded module

Package Checklist (Development Kit)

- EM-1220 embedded module
- EM-1220-DK, the carrier board for the EM-1220 module
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adaptor (including terminal block to power jack converter)
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

Embedded Computers for Automation

Product Selection Guides

DIN-Rail Computers 16-2

Embedded Computers for Automation

IA260 Series RISC-based computers with 4 serial ports 16-3

IA261-I/262-I Series RISC-based computers with 2 or 4 digitally isolated serial ports .16-6

IA240/241 Series RISC-based industrial computers with 4 serial ports 16-9

DIN-Rail Computers

	IA260-CE IA260-T-CE	IA260-LX IA260-T-LX	IA261-I-LX IA261-I-T-LX	IA261-I-CE IA261-I-T-CE	IA262-I-LX IA262-I-T-LX	IA262-I-CE IA262-I-T-CE	IA240-LX IA240-T-LX	IA241-LX IA241-T-LX
Computer								
CPU Speed	200 MHz	200 MHz	200 MHz	200 MHz	200 MHz	200 MHz	192 MHz	192 MHz
OS (pre-installed)	WinCE 6.0	Linux	Linux	WinCE 6.0	Linux	WinCE 6.0	Embedded Linux	
DRAM	128 MB (256 MB max.)						64 MB	64 MB
Flash	32 MB (64 MB max.)		32 MB	32 MB	32 MB	32 MB	32 MB	32 MB
PCMCIA	---	---	---	---	---	---	---	√
USB Ports	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	1 (USB 2.0)	1 (USB 2.0)
Digital I/O	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs
Storage								
CompactFlash Socket	√	√	√	√	√	√	---	---
SD Slot	---	---	---	---	---	---	√	√
Display								
Graphics Controller	√	√	√	√	√	√	---	---
LAN Interface								
10/100 Mbps Ethernet Ports	2	2	2	2	2	2	2	2
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface								
RS-232/422/485 Ports	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	2 (DB9-M)	2 (DB9-M)	4 (RJ45)	4 (RJ45)
ESD Protection	---	---	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Digital Isolation	---	---	2 KV	2 KV	2 KV	2 KV	---	---
Console Port	√	√	√	√	√	√	√	√
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark							
Flow Control	RTS/CTS, XON/XOFF, ADDC®							
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)							
CANbus	---	---	---	---	2 (DB9-M)	2 (DB9-M)	---	---
LEDs								
System	Power, Ready, Storage							
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M
Serial	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics								
Housing	Aluminum, industrial vertical form factor						Aluminum (1 mm)	
Weight	1 kg	1 kg	950 g	950 g	950 g	950 g	430 g	500 g
Dimensions	52 x 112.6 x 162 mm	52 x 112.6 x 162 mm	60 x 115 x 152 mm	60 x 115 x 152 mm	60 x 115 x 152 mm	60 x 115 x 152 mm	60 x 137 x 100 mm	60 x 137 x 100 mm
Mounting	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall
Environmental Limits								
Operating Temperature	-10 to 60°C or -40 to 75°C							
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 80°C or -40 to 85°C							
Regulatory Approvals								
EMC	CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)						CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)	
Safety	UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)						UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)	
Green Product	RoHS, CRoHS, WEEE							
Reliability								
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√
Warranty	5 years (see www.moxa.com/warranty)							

IA260 Series

RISC-based computers with 4 serial ports, dual LANs, VGA, DIO, CompactFlash, USB

TAIWAN EXCELLENCE 2009

- Cirrus Logic EP9315 ARM9 CPU, 200 MHz
- 128 MB RAM on-board, 32 MB flash disk
- 4 software-selectable RS-232/422/485 serial ports
- VGA interface for field site monitoring
- Dual 10/100 Mbps Ethernet for network redundancy
- 8+8 DI/DO channels, up to 30 VDC
- 12 to 48 VDC power input design
- Supports CompactFlash and USB 2.0 hosts
- Ready-to-run Linux/WinCE 6.0 platform
- H-type heat dissipation design for system reliability
- -40 to 75°C wide operating temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The IA260 embedded computers come with 4 RS-232/422/485 serial ports, dual Ethernet ports, 8 digital input channels, 8 digital output channels, a VGA output, 2 USB hosts, and a CompactFlash socket. The computers are housed in a compact, IP40 protected, industrial-strength aluminum case.

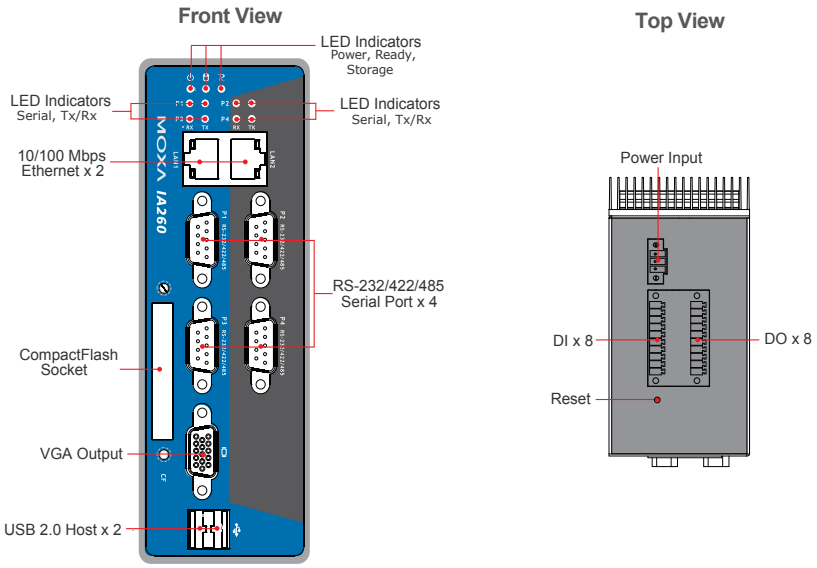
The IA260 computers use the Cirrus Logic EP9315 ARM9, 32-bit, 200 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 32 MB NOR Flash ROM and 128 MB SDRAM give you enough memory to run your application software directly on the IA260.

The patented "H-Type" heat dissipation design makes the IA260 an ideal computing unit for applications in extremely hot field sites, since it can directly transmit heat from inside the housing to the air. With its built-in VGA output interface, the IA260 computers are suitable for use with SCADA systems in industrial applications, such as factory automation, production line process monitoring, and mining automation, that require VGA and HMI features.

The IA260 computers support RS-232/422/485, digital I/O, and have dual LAN ports, making them ideal as communication platforms for industrial applications that require network redundancy. In addition to the standard model, a wide temperature (-40 to 75°C) model is available for use in harsh industrial automation environments.

The IA260 embedded computers come pre-installed with either the open standard Linux OS, or the more common WinCE OS. Software written for a desktop PC can be easily ported to the IA260 platform by using a common compiler, without needing to modify the code, and the software you develop for your own applications can be stored in the IA260's flash memory.

Appearance



Hardware Specifications

Computer

CPU: Cirrus EP9315 ARM9 CPU, 200 MHz

OS (pre-installed): Windows CE 6.0 or Linux

DRAM: 128 MB onboard (optional 256 MB)

Flash: 32 MB onboard (optional 64 MB)

USB: USB hosts x 2, compliant with USB 2.0 (OHCI) type A connectors

Storage

Storage Expansion: CompactFlash slot

Display

Graphics Controller: EP9315 internal graphics accelerator engine with TTL graphical signal support

Display Memory: Dynamic video memory (shares system memory)

Display Interface: CRT interface for VGA output, DB15 female connector

Resolution: 1024 x 768, 8 bits

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 4 RS-232/422/485 ports, software-selectable (DB9 male)

Console Port: RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

Digital Input

Input Channels: 8, source type

Input Voltage: 0 to 30 VDC at 5 KHz

Digital Input Levels for Dry Contacts:
- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:
- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (COM to DI)

Connector Type: 10-pin screw terminal block (8 points, COM, GND)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 8, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 V

Connector Type: 9-pin screw terminal block

Isolation: 3 KV optical isolation

LEDs

System: Power, Ready, Storage

LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Serial: TxD x 4, RxD x 4

Switches and Buttons

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: Aluminum, industrial vertical form factor

Weight: 1 kg

Dimensions: 52 x 112.6 x 162 mm (2.05 x 4.43 x 6.38 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Anti-vibration: 2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 12 to 48 VDC (3-pin terminal block)

Power Consumption:
With no load on USB ports: 5.8 W
- 240 mA @ 24 VDC
- 480 mA @ 12 VDC

With full load on USB ports: 11 W
- 450 mA @ 24 VDC
- 900 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)

Reliability

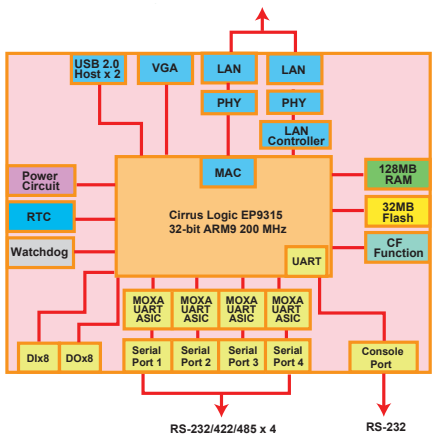
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.



Software Specifications

Linux

Kernel Version: 2.6.23

Protocol Stack: ARP, PPP, CHAP, PAP, IPv4, ICMP, TCP, UDP, DHCP, FTP, SNMP V1, HTTP, NTP, NFS, SMTP, SSH 1.0/2.0, SSL, Telnet, PPPoE, OpenVPN

File System: JFFS2, NFS, Ext2, Ext3, VFAT/FAT

System Utilities: bash, tinylogin, telnet, ftp, smtpclient, scp

telnetd: telnet server daemon

sshd: secure shell server

Apache: web server daemon

openvpn: virtual private network

pppd: dial in/out over serial port daeon

snmpd: snmpd agent daeon

inetd: TCP server manager program

openssl: open SSL

Linux Tool Chain:
- GCC (V4.2.1): C/C++ PC Cross Compiler
- GDB (V5.3): Source level debug server
- Glibc (V2.2.5): POSIX standard C library

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

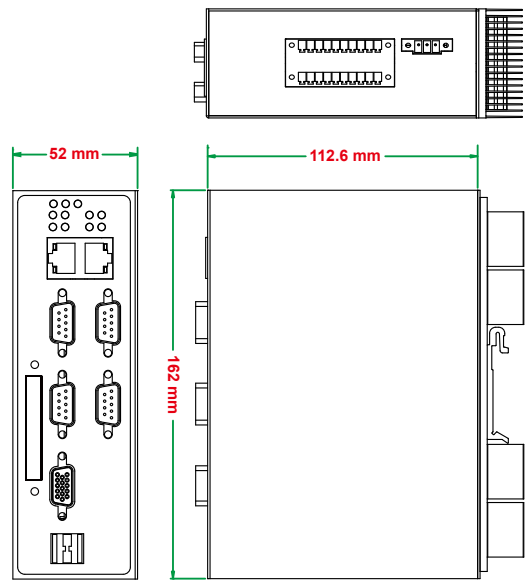
Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

Dial-up Networking Service: RAS client API and PPP, supporting Extensible Authentication Protocol (EAP) and RAS scripting.

Watchdog Server: CPU hardware function for resetting the CPU in a user-specified time interval; activated by a Moxa library function

Application Development Software:
- Moxa WinCE 6.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0 with SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX
- SOAP Toolkit
- Winsock 2.2

Dimensions



Ordering Information

Available Models

IA260-CE: RISC-based embedded computer with 4 serial ports, 8 DIs, 8 DOs, dual LANs, VGA, CompactFlash, USB, Win CE 6.0 OS, -10 to 60°C operating temperature

IA260-LX: RISC-based industrial embedded computer with 4 serial ports, 8 DIs, 8 DOs, dual LANs, VGA, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature

IA260-T-CE: RISC-based embedded computer with 4 serial ports, 8 DIs, 8 DOs, dual LANs, VGA, CompactFlash, USB, Win CE 6.0 OS, -40 to 75°C operating temperature

IA260-T-LX: RISC-based industrial embedded computer with 4 serial ports, 8 DIs, 8 DOs, dual LANs, VGA, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

Package Checklist

- IA260 or IA260-T computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-RJ45F9-150: 8-pin RJ45 to DB9 female console port cable, 150 cm
- CBL-RJ45M9-150: 8-pin RJ45 to DB9 male serial port cable, 150 cm
- Universal Power Adaptor
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

IA261-I/262-I Series

RISC-based computers with 2 or 4 digitally isolated serial ports, dual LANs, VGA, CAN, DIO, CompactFlash, USB

- Cirrus Logic EP9315 ARM9 CPU, 200 MHz
- 128 MB RAM on-board, 32 MB flash disk
- VGA interface for field site monitoring
- 2 KV digitally isolated RS-232/422/485 serial ports
- Dual 10/100 Mbps Ethernet for network redundancy
- Dual 2 KV digitally isolated CAN ports with CANopen protocol support
- 8+8 DI/DO with 3 KV optical isolation protection
- 12 to 48 VDC redundant power input design
- Supports CompactFlash and USB 2.0 hosts
- Ready-to-run Linux or WinCE 6.0 platform
- -40 to 75°C wide temperature models available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

The IA261-I/262-I embedded computers come with 2 (IA262-I) or 4 (IA261) RS-232/422/485 serial ports, dual CANbus ports (IA262-I only), dual Ethernet ports, 8 digital input channels, 8 digital output channels, VGA output, 2 USB hosts, and a CompactFlash socket. The computers are housed in a compact, IP40 protected, industrial-strength aluminum case.

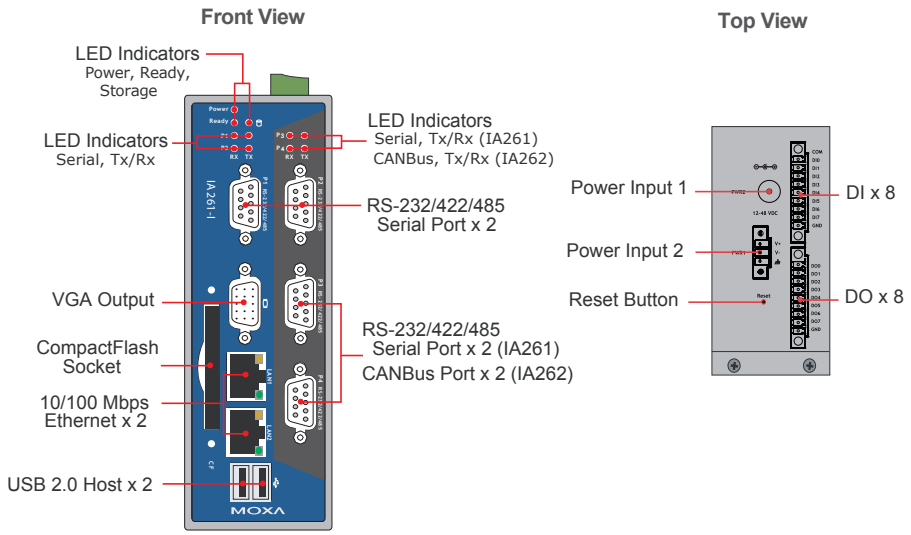
The IA261-I/262-I computers use the Cirrus Logic EP9315 ARM9, 32-bit, 200 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 32 MB NOR Flash ROM and 128 MB SDRAM provide enough memory to run your application software directly on the IA261-I/262-I.

With its built-in VGA output interface, the IA261-I/262-I are suitable for use with SCADA systems in industrial applications, such as manufacturing automation, production line process monitoring, and mining automation, that require VGA and HMI features.

The IA261-I/262-I computers support RS-232/422/485, CANbus, digital I/O, come with 2 KV isolation protection, and have dual LAN ports, making them ideal as communication platforms for industrial applications that require network redundancy. In addition to the standard models, wide temperature (-40 to 75°C) models are available for use in harsh industrial automation environments.

The IA261-I/262-I embedded computers come pre-installed with either the open standard Linux OS, or the more common WinCE OS. Software written for a desktop PC can be easily ported to the IA261-I/262-I platform by using a common compiler, without needing to modify the code, and the software you develop for your own applications can be stored in the IA261-I/266-I's flash memory.

Appearance



Hardware Specifications

Computer

CPU: Cirrus EP9315 ARM9 CPU, 200 MHz

OS (pre-installed): Windows CE 6.0 or Linux

DRAM: 128 MB onboard (optional 256 MB)

Flash: 32 MB onboard

USB: USB hosts x 2, compliant with USB 2.0 (OHCI) type A connectors

Storage

Storage Expansion: CompactFlash slot

Display

Graphics Controller: EP9315 internal graphics accelerator engine with TTL graphical signal support

Display Memory: Dynamic video memory (shares system memory)

Display Interface: CRT interface for VGA output, DB15 female connector

Resolution: 1024 x 768, 8 bits

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 2 or 4 RS-232/422/485 ports, software-selectable (DB9 male)

ESD Protection: 15 KV for all signals

Isolation: 2 KV digital isolation

Console Port: RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC™ (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

Digital Input

Input Channels: 8, source type

Input Voltage: 0 to 30 VDC at 5 KHz

Digital Input Levels for Dry Contacts:
- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:
- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (COM to DI)

Connector Type: 10-pin screw terminal block (8 points, COM, GND)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 8, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 V

Connector Type: 9-pin screw terminal block

Isolation: 3 KV optical isolation

CANbus Communication (IA262-I only)

Interface: Dual optically isolated CAN2.0A/2.0B compliant ports

CAN Controller: Phillips SJA1000T

Signals: CAN-H, CAN-L

Protocols: Supports CANOpen library

Isolation: 2 KV digital isolation

Speed: 10 Kbps to 1 Mbps

Connector Type: DB9 male

LEDs

System: Power, Ready, Storage

LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Serial: TxD x 4, RxD x 4
IA261-I: P1 to P4 for serial ports
IA262-I: P1 to P2 for serial ports, P3 to P4 for CAN ports

Switches and Buttons

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: Aluminum, industrial vertical form factor

Weight: 950 g

Dimensions: 60 x 115 x 152 mm (2.36 x 4.53 x 5.98 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Anti-vibration: 5 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 50 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: Redundant power input design
PWR1: 12 to 48 VDC (3-pin terminal block)
PWR2: 12 to 48 VDC (power jack with thread)

Power Consumption:
With no load on USB ports: 5.8 W
- 240 mA @ 24 VDC
- 480 mA @ 12 VDC

With full load on USB ports: 11 W
- 450 mA @ 24 VDC
- 900 mA @ 12 VDC

Regulatory Approvals

EMC: CE (Class A), FCC

Safety: UL/cUL

Green Product: RoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Linux

Kernel Version: 2.6.23

Protocol Stack: ARP, PPP, CHAP, PAP, IPv4, ICMP, TCP, UDP, DHCP, FTP, SNMP V1, HTTP, NTP, NFS, SMTP, SSH 1.0/2.0, SSL, Telnet, PPPoE, OpenVPN

File System: JFFS2, NFS, Ext2, Ext3, VFAT/FAT

System Utilities: bash, tinylogin, telnet, ftp, smtpclient, scp

telnetd: telnet server daemon

sshd: secure shell server

Apache: web server daemon

openvpn: virtual private network

pppd: dial in/out over serial port daeon

snmpd: snmpd agent daeon

inetd: TCP server manager program

openssl: open SSL

Linux Tool Chain:
- GCC (V4.2.1): C/C++ PC Cross Compiler
- GDB (V5.3): Source level debug server
- Glibc (V2.2.5): POSIX standard C library

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

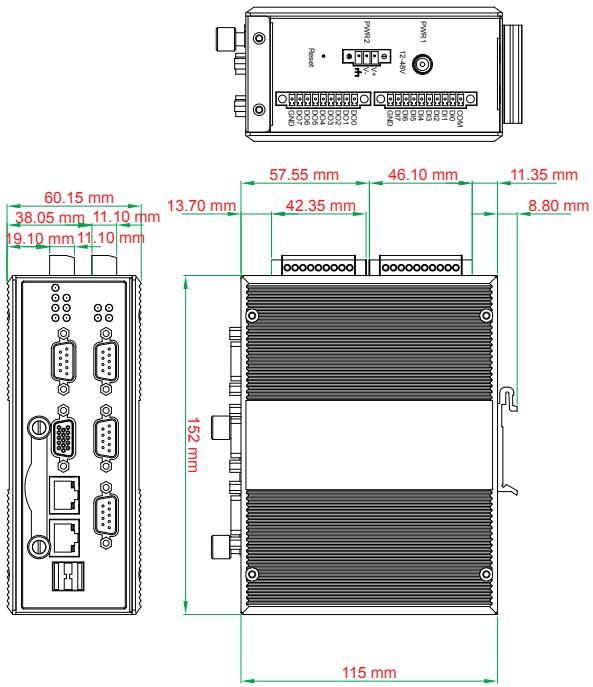
Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

Dial-up Networking Service: RAS client API and PPP, supporting Extensible Authentication Protocol (EAP) and RAS scripting.

Watchdog Server: CPU hardware function for resetting the CPU in a user-specified time interval; activated by a Moxa library function

Application Development Software:
- Moxa WinCE 6.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0 with SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX
- SOAP Toolkit
- Winsock 2.2

Dimensions



Ordering Information

Available Models

IA261-I-LX: RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature

IA261-I-CE: RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, CompactFlash, USB, Win CE 6.0 OS, -10 to 60°C operating temperature

IA262-I-LX: RISC-based embedded computer with 2 serial ports, DIO, dual LANs, VGA, CANbus, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature

IA262-I-CE: RISC-based embedded computer with 2 serial ports, DIO, dual LANs, VGA, CANbus, CompactFlash, USB, Win CE 6.0 OS, -10 to 60°C operating temperature

IA261-I-T-LX: RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

IA261-I-T-CE: RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, CompactFlash, USB, Win CE 6.0 OS, -40 to 75°C operating temperature

IA262-I-T-LX: RISC-based embedded computer with 2 serial ports, DIO, dual LANs, VGA, CANbus, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

IA262-I-T-CE: RISC-based embedded computer with 2 serial ports, DIO, dual LANs, VGA, CANbus, CompactFlash, USB, Win CE 6.0 OS, -40 to 75°C operating temperature

Package Checklist

- IA261-I or IA262-I computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-RJ45F9-150: 8-pin RJ45 to DB9 female console port cable, 150 cm
- CBL-RJ45M9-150: 8-pin RJ45 to DB9 male serial port cable, 150 cm
- Universal Power Adaptor
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

IA240/241 Series

RISC-based industrial computers with 4 serial ports, 4 DI and 4 DO channels, dual LANs, PCMCIA, SD

TAIWAN EXCELLENCE 2006

- MOXA ART 32-bit ARM9 industrial processor
- 64 MB RAM, 16 MB flash onboard
- 4 RS-232/422/485 serial ports
- 4 digital input and 4 digital output channels (TTL signal)
- Dual 10/100 Mbps Ethernet for network redundancy
- PCMCIA slot for wireless expansion (802.11b/g, GPRS/UMTS/HSDPA)
- SD socket for storage expansion
- Ready-to-run Linux Kernel 2.6 platform
- Unique patented Software Encryption Lock
- Installation options: DIN-rail, wallmount (with accessory)
- Robust, fanless design, IP30 protection mechanism
- -40 to 75°C wide temperature models available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

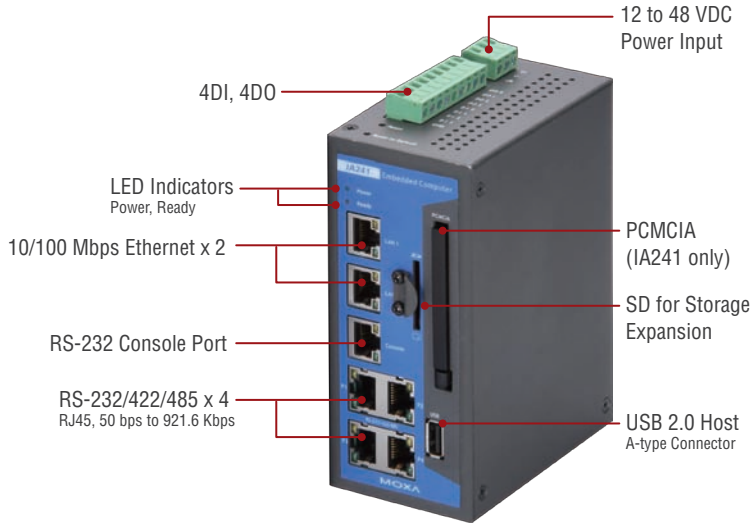
The IA240/241 embedded computers are designed for industrial automation applications. The computers feature 4 RS-232/422/485 serial ports, dual LANs, 4 digital input channels, 4 digital output channels, and a PCMCIA cardbus and SD socket in a compact, IP30 protected, industrial-strength rugged housing.

The IA240/241's vertical DIN-rail form factor makes it easy to install the computers in a small cabinet. This space-saving solution also facilitates easy wiring, making the IA240/241 a great choice as front-end embedded controllers for industrial applications.

Wide temperature models of the IA240/241 are also available. The IA240-T and IA241-T can operate reliably in a temperature range from -40 to 75°C, making them appropriate for harsh industrial automation environments.

The industrial design of the IA240/IA241 provides a robust, reliable computing platform. Due to their RISC-based architecture, the IA240/IA241 computers will not generate a lot of heat, making them ideal for industrial automation environments.

Appearance



Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit RISC CPU, 192 MHz

OS (pre-installed): Embedded Linux

DRAM: 64 MB onboard (128 MB for IA241 ODM)

Flash: 16 MB onboard (32 MB for IA241 ODM)

PCMCIA: Cardbus card and 16-bit PCMCIA 2.1, JEIDA 4.2 card (IA241 only)

USB: USB 2.0 host

Storage

Storage Expansion: SD slot

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 4 RS-232/422/485 ports, software-selectable (8-pin RJ45)

ESD Protection: 15 KV for all signals

Console Port: RS-232, RJ45 connector, supports PPP

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

Digital Input

Input Channels: 4

Input Voltage:
Logic 0: 0-0.8 V
Logic 1: 2.0-5.5 V

Over-current Limit: -24 mA

Digital Output

Output Channels: 4

Output Current: 24 mA

Output Voltage:
Logic 0: 0-0.55 V
Logic 1: 2.5-3.3 V

LEDs

System: Power, Ready, Storage

LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Serial: TxD x 4, RxD x 4 (on connector)

Switches and Buttons

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: Aluminum (1 mm)

Weight:
IA240: 430 g
IA241: 500 g

Dimensions: 60 x 137 x 100 mm (2.36 x 5.39 x 3.94 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Anti-vibration: 1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 mins 17 sec per axis

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 7 W
- 300 mA @ 24 VDC
- 600 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

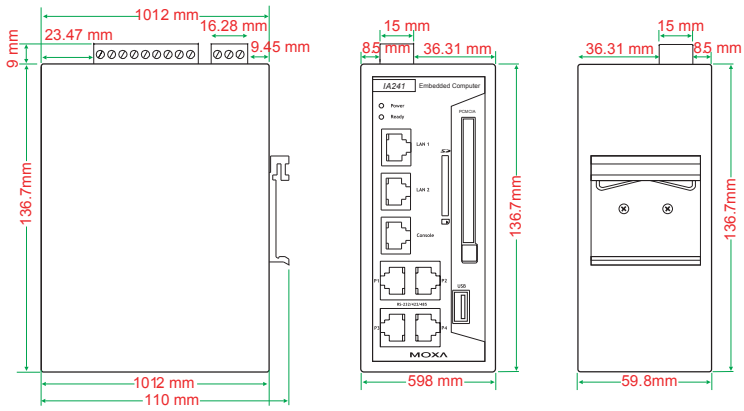
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

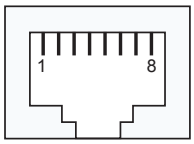
Dimensions



Side View | Front View | Rear View

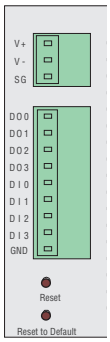
Pin Assignment

Serial Port, RJ45 Connector



PIN	RS-232	RS-422	RS-485
1	DSR	---	---
2	RTS	TxD+	---
3	GND	GND	GND
4	TxD	TxD-	---
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	---	---
8	DTR	---	---

Terminal Block on Top



Power Input

DI/DO

Software Specifications

Linux

Kernel Version: 2.6.9

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/ 2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

Application Development Software:
- Moxa Linux API Library for device control
- Linux Tool Chain: Gcc, Glibc, GDB

Software Encryption Lock:
BINEncryptor: Encryption tool for binary files (based on patented Moxa technology)

Ordering Information

Available Models

IA240-LX: RISC-based industrial computer with 4 serial ports, 4 DI and 4 DO channels, dual LANs, SD, Linux OS, -10 to 60°C operating temperature

IA241-LX: RISC-based industrial computer with 4 serial ports, 4 DI and 4 DO channels, dual LANs, PCMCIA, SD, Linux OS, -10 to 60°C operating temperature

IA240-T-LX: RISC-based industrial computer with 4 serial ports, 4 DI and 4 DO channels, dual LANs, SD, Linux OS, -40 to 75°C operating temperature

IA241-T-LX: RISC-based industrial computer with 4 serial ports, 4 DI and 4 DO channels, dual LANs, PCMCIA, SD, Linux OS, -40 to 75°C operating temperature

Package Checklist

- IA240 or IA241 computer
- Wall mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-RJ45F9-150: 8-pin RJ45 to DB9 female console port cable, 150 cm
- CBL-RJ45M9-150: 8-pin RJ45 to DB9 male serial port cable, 150 cm
- Universal power adaptor (including terminal block to power jack converter)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

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Wireless Embedded Computers

Product Selection Guides

RISC-based WLAN Computers 17-2

Cellular Computers 17-3

Distributed/Remote Solutions

W311/321/341 RISC-based WLAN computers with 1/2/4 serial ports 17-4

W315/325/345 RISC-based GSM/GPRS computers with 1/2/4 serial ports 17-8

RISC-based WLAN Computers

	W311-LX	W321-LX	W341-LX
Computer			
CPU Speed	192 MHz	192 MHz	192 MHz
OS (pre-installed)	Embedded Linux with MMU support		
DRAM	32 MB	32 MB	64 MB
Flash	16 MB	16 MB	16 MB
USB Ports	---	---	2 (USB 2.0)
Relay Output	---	---	√
Storage			
SD Slot	√	√	√
LAN Interface			
10/100 Mbps Ethernet Ports	1	1	1
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV
100BaseFX Fiber Ports (multi-mode)	---	---	---
WLAN Interface			
Standard Compliance	802.11a/b/g		
Radio Frequency Type	DSSS, CCK, OFDM		
Transmission Rate	54 Mbps (max.) with auto fallback (54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1 Mbps) • 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11b: 1, 2, 5.5, 11 Mbps		
Transmission Distance	Up to 100 meters (@ 11 Mbps in open areas)		
Wireless Security	WEP: 64-bit/128-bit, WPA, WPA2 data encryption		
WLAN Modes	Ad-hoc (802.11b/g), Infrastructure		
Serial Interface			
RS-232/422/485 Ports	1 (DB9-M)	2 (DB9-M)	4 (DB9-M)
ESD Protection	15 KV	15 KV	15 KV
Console Port	√	√	√
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark		
Flow Control	RTS/CTS, XON/XOFF, ADDC™		
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)		
LEDs			
System	Ready, SD	Ready, SD	Ready, SD
LAN	10M, 100M	10M, 100M	10M, 100M
WLAN	Enable, Signal Strength		
Serial	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics			
Housing	Aluminum (1 mm)		
Weight	170 g	185 g	390 g
Dimensions	77 x 111 x 26 mm	77 x 111 x 26 mm	150 x 100 x 38 mm
Mounting	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall
Environmental Limits			
Operating Temperature	-10 to 60°C	-10 to 60°C	-10 to 60°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C
Anti Vibration/Shock	5g/50g	5g/50g	5g/50g
Regulatory Approvals			
EMC	CE (ETSI EN 301 489-1/-17, ETSI EN 301 893, ETSI EN 300 328, EN50392), FCC Part 15C & Part 15E		
Safety	UL/cUL (UL60950-1), TÜV (EN60950-1)		
Green Product	RoHS, CRoHS, WEEE		
Reliability			
Buzzer, RTC, WDT	√	√	√
Warranty	5 years (see www.moxa.com/warranty)		

Cellular Computers

	W315-LX	W325-LX	W345-LX
Computer			
CPU Speed	192 MHz	192 MHz	192 MHz
OS (pre-installed)	Embedded Linux with MMU support		
DRAM	32 MB	32 MB	64 MB
Flash	16 MB	16 MB	16 MB
USB Ports	---	---	2 (USB 2.0)
Relay Output	---	---	√
Storage			
SD Slot	√	√	√
LAN Interface			
10/100 Mbps Ethernet Ports	1	1	1
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV
100BaseFX Fiber Ports (multi-mode)	---	---	---
Cellular Interface			
Cellular Modes	GSM, GPRS		
Radio Frequency Bands	850/900/1800/1900 MHz		
GPRS Class	10		
Coding Schemes	CS1 to CS4		
Serial Interface			
RS-232/422/485 Ports	1 (DB9-M)	2 (DB9-M)	4 (DB9-M)
ESD Protection	15 KV	15 KV	15 KV
Console Port	√	√	√
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark		
Flow Control	RTS/CTS, XON/XOFF, ADDC™		
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)		
LEDs			
System	Ready, SD	Ready, SD	Ready, SD
LAN	10M, 100M	10M, 100M	10M, 100M
Cellular	GPRS Enabled, GSM Signal Strength		
Serial	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics			
Housing	Aluminum (1 mm)		
Weight	195 g	195 g	400 g
Dimensions	77 x 111 x 26 mm	77 x 111 x 26 mm	150 x 100 x 38 mm
Mounting	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall
Antenna Length	110 mm	110 mm	110 mm
Environmental Limits			
Operating Temperature	-10 to 60°C	-10 to 60°C	-10 to 60°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C
Anti Vibration/Shock	5g/50g	5g/50g	5g/50g
Regulatory Approvals			
EMC	FCC: Part 15, Part 24/24		
CE	EN55022, EN61000		
R&TTE	EN301 489-1, EN301 489-7, EN301 511		
Safety	LVD: EN60950-1 UL/cUL: UL60950-1, CSA C22.2 No. 60950-1-03		
Green Product	GCF-CC, RoHS, CRoHS, WEEE		
Reliability			
Buzzer, RTC, WDT	√	√	√
Warranty	5 years (see www.moxa.com/warranty)		

W311/321/341

RISC-based embedded Linux computers with WLAN, LAN, and 1, 2, or 4 serial ports

- MOXA ART ARM9 32-bit 192 MHz processor running Linux 2.6
- 32 or 64 MB RAM, and 16 MB flash disk on board
- 802.11a/b/g WLAN with repeater function
- WEP, WPA, and WPA2 encryption
- 10/100 Mbps Ethernet for network redundancy
- Relay output for external alarm connection (W341 only)
- SD socket for storage expansion
- DIN-rail or wallmount installation
- Designed to withstand 5 g's of continuous vibration and 50-g shocks
- Robust, fan-less design

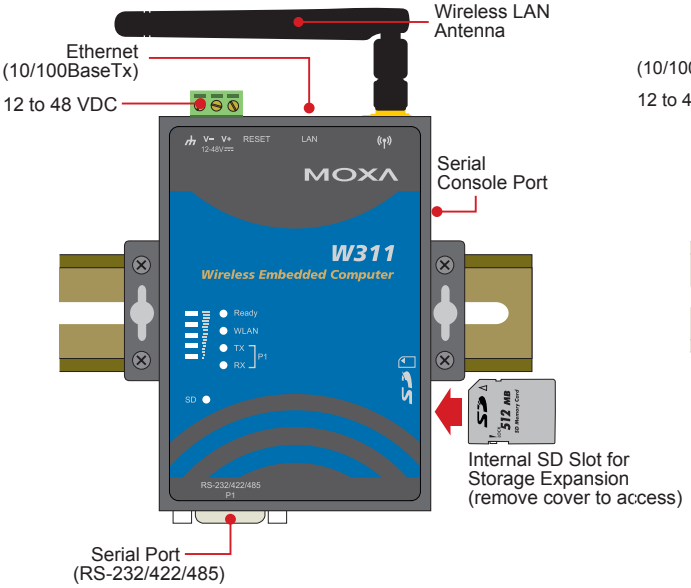
The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

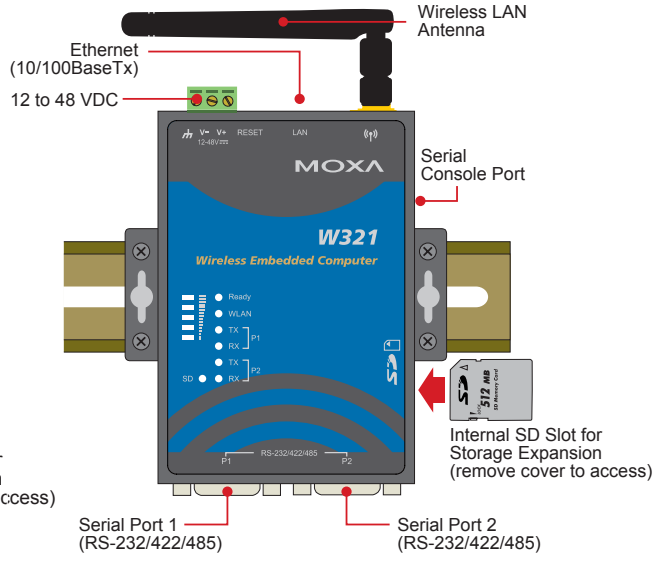
The W311/321/341 embedded Linux computers feature 1, 2, or 4 software selectable RS-232/422/485 ports, and support the IEEE 802.1a/b/g standards for WLAN connections. In addition, the computers have 1 Ethernet port, and some models come with USB 2.0 hosts and an SD socket for storage expansion. The W311/321/341 computers' Linux OS runs on the MOXA ART 32-bit ARM9 processor that provides a powerful and reliable platform for harsh, industrial environments. You will find these computers ideal for a variety of machine-to-machine applications, including data acquisition, protocol conversion, and remote device control and monitoring.

Appearance

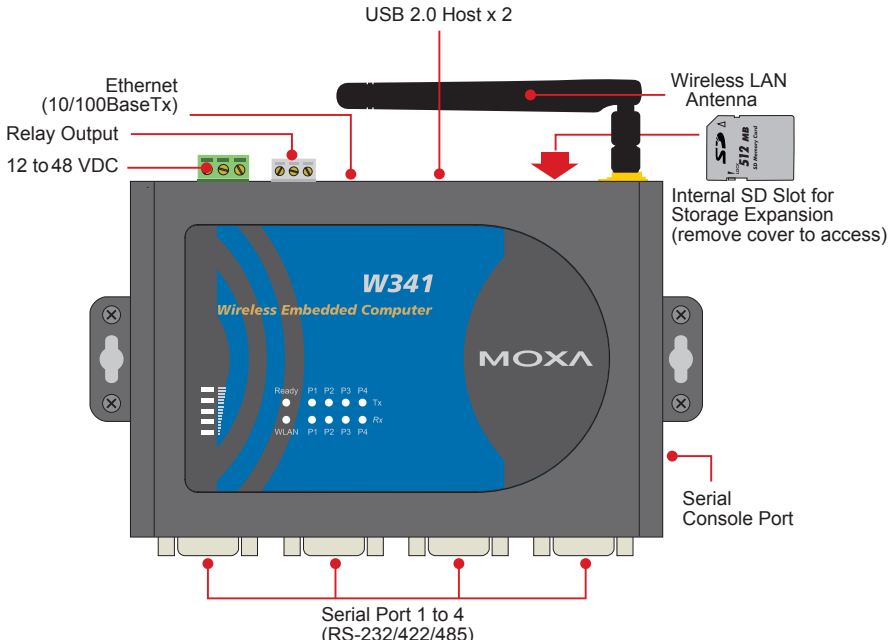
W311



W321



W341



Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit 192 MHz

OS (pre-installed): Embedded Linux with MMU support

DRAM:
W311/321: 32 MB
W341: 64 MB

Flash: 16 MB

USB: (W341 only) USB 2.0 compliant hosts x 2, type A connector

Relay Output: (W341 only)
- Form C, SPDT x 1
- Normal Switching Capacity: 2 A @ 30 VDC
- Switching Power: 60 W max.
- Switching Voltage: 220 VDC max.
- Switching Current: 2 A max.
- Operating Time: 4 ms @ 20°C
- Initial Contact Resistance: 100 milli-ohm max.

Storage Expansion: SD slot

Ethernet Interface

LAN: 1 auto-sensing 10/100 Mbps port (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

WLAN Interface

Standard Compliance: 802.11a/b/g

Radio Frequency Type: DSSS, CCK, OFDM

Media Access Protocol: CSMA/CA (Carrier Sense Multiple Access with Collision Avoidance)

Transmission Power (typical):
- 5.15 to 5.35 GHz: 15 dBm @ 6 Mbps; 12 dBm @ 54 Mbps
- 5.725 to 5.825 GHz: 15 dBm @ 6 Mbps; 12 dBm @ 54 Mbps
- USA: 2.412 to 2.462 GHz
  IEEE 802.11g: 17 dBm @ 6 Mbps; 15 dBm @ 54 Mbps
  IEEE 802.11b: 18 dBm @ 1 to 11 Mbps
- EU: 2.412 to 2.472 GHz

Receiver Sensitivity (typical):
- 5.15 to 5.35 GHz: 6 Mbps @ -90 dBm; 54 Mbps @ -72 dBm
- 5.47 to 5.725 GHz: 6 Mbps @ -90 dBm; 54 Mbps @ -72 dBm
- 5.725 to 5.825 GHz: 6 Mbps @ -89 dBm; 54 Mbps @ -72 dBm
- USA: 2.412 to 2.462 GHz
  IEEE802.11g: 6 Mbps @ -90 dBm; 54 Mbps @ -73 dBm
  IEEE802.11b: 11 Mbps @ -87 dBm; 1 Mbps @ -94 dBm
- EU: 2.412 to 2.472 GHz

Transmission Rate: 54 Mbps (max.) with auto fallback (54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1 Mbps)
- 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
- 802.11b: 1, 2, 5.5, 11 Mbps

Transmission Distance: Up to 100 meters (@ 11 Mbps in open areas)

Antenna Connector: Reverse SMA

Antenna: External 2 dbi dipole antenna

Wireless Security: WEP: 64-bit/128-bit, WPA, WPA2 data encryption

WLAN Modes: Ad-hoc (802.11b/g), Infrastructure

Serial Interface

Serial Standards: 1, 2, or 4 RS-232/422/485 ports, software-selectable (DB9 male)

EDS Protection: 15 KV ESD protection for all signals

Console Port: RS-232 interface (TxD, RxD, GND), with 4-pin pin header output

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC™ (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

LEDs

System: Ready, SD

LAN: 10M/Link, 100M/Link (on connector)

WLAN: Enable, Signal Strength

Serial: TxD, RxD

Switches and Buttons

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: Aluminum (1 mm)

Weight:
W311: 170 g
W321: 185 g
W341: 390 g

Dimensions: (without ears or antenna)
W311/W321: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
W341: 150 x 100 x 38 mm (5.91 x 3.94 x 1.50 in)

Mounting: DIN-rail (requires optional DK-35A DIN-rail kit), wall

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 80°C (-4 to 176°F)

Anti-vibration: 5 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 50 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
W311/321: 4.8 W
• 400 mA @ 24 VDC
• 400 mA @ 12 VDC
W341:
With no load on USB ports: 7.2 W
• 300 mA @ 24 VDC
• 600 mA @ 12 VDC
With full load on USB ports: 14.4 W
• 600 mA @ 24 VDC
• 1200 mA @ 12 VDC

Regulatory Approvals

EMC: CE (ETSI EN 301 489-1/-17, ETSI EN 301 893, ETSI EN 300 328, EN50392), FCC Part 15C & Part 15E

Safety: UL/cUL (UL60950-1), TÜV (EN60950-1)

Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock) with battery backup

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Software Specifications

Linux

Kernel Version: 2.6.9

Boot Loader: Redboot

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/ 2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

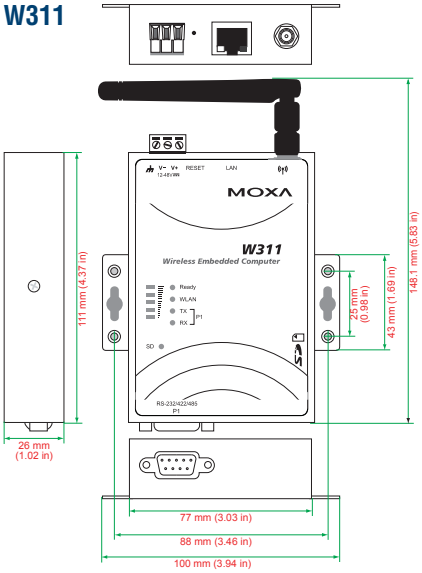
Application Development Environment:
• MOXA Linux API Library
• Linux Tool Chain: Gcc, Glibc, GDB
• BINEncryptor: Encryption tool for binary files, based on "Moxa Intellectual Protection Technology" (Patented)

Device Drivers:
• W311/W321: UART, RTC, Buzzer, SD Card
• W341: UART, RTC, Buzzer, SD Card, USB (supports USB flash disk), Watchdog Timer, DO

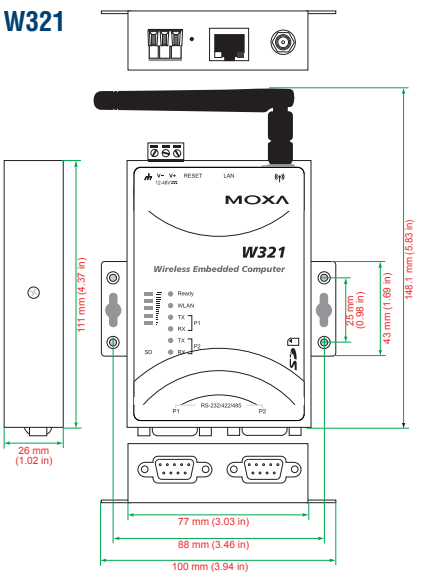
Software Encryption Lock:
BINEncryptor: Encryption tool for binary files (based on patented Moxa technology)

Dimensions

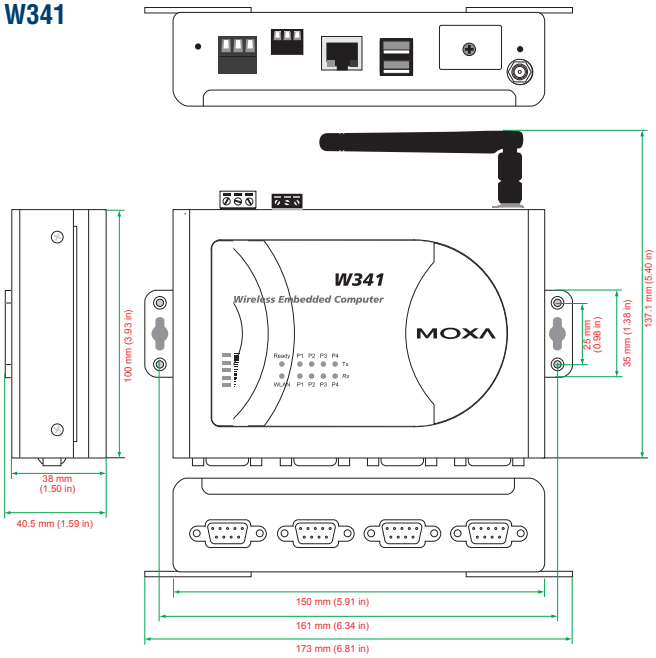
W311



W321

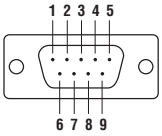


W341



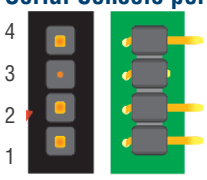
Pin Assignment

Male DB9



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Serial Console port



PIN	
1	TxD
2	RxD
3	NC
4	GND

Ordering Information

Available Models

W311-LX: Mini RISC-based wireless Linux computer with WLAN, 1 serial port, LAN, and SD

W321-LX: Mini RISC-based wireless Linux computer with WLAN, 2 serial ports, LAN, and SD

W341-LX: RISC-based wireless Linux computer with WLAN, 4 serial ports, LAN, SD, USB, and relay output

Package Checklist

- W311 or W321 or W341 computer
- Wall mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adaptor (including terminal block to power jack converter)
- WLAN Antenna
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

W315/325/345

RISC-based embedded computers with GSM/GPRS, LAN, and 1, 2, or 4 serial ports

- MOXA ART ARM9 32-bit 192 MHz processor
- 32 or 64 MB RAM, and 16 MB flash disk onboard
- Built-in quad band GSM/GPRS 850/900/1800/1900 MHz
- GPRS Class 10, coding scheme from CS1 to CS4 supported
- 1, 2, or 4 software-selectable RS-232/422/485 serial ports
- 10/100 Mbps Ethernet for network redundancy
- Designed to withstand 5 g's of continuous vibration and 50-g shocks
- Relay Output for external alarm connection (W345 only)
- SD slot for storage expansion
- Ready-to-run Linux Kernel 2.6 platform
- DIN-rail or wall-mount installation
- Robust, fanless design

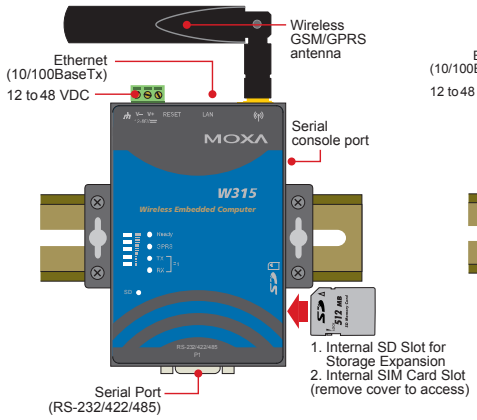
The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Overview

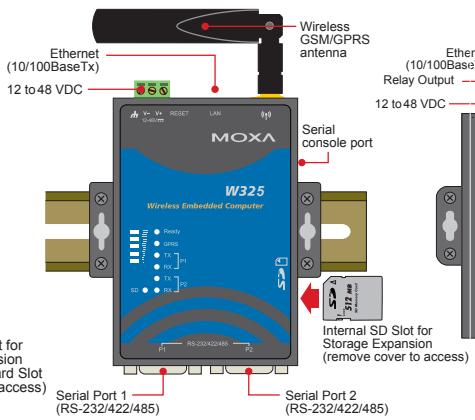
The W315/325/345 are embedded Linux computers that feature 1, 2, or 4 software selectable RS-232/422/485 ports, 1 Ethernet port, and quad-band GSM/GPRS 900/1800/850/1900 MHz for cellular communication. In addition, the W345 has 2 USB 2.0 hosts and 1 relay output, and the W325 and W345 come with an SD socket for external storage expansion. The W315/325/345 computers' Linux OS runs on the MOXA ART 32-bit ARM9 processor, which provides a powerful and reliable platform for harsh, industrial environments. You will find these computers ideal for a variety of machine-to-machine applications, including data acquisition, protocol conversion, and remote device control and monitoring.

Appearance

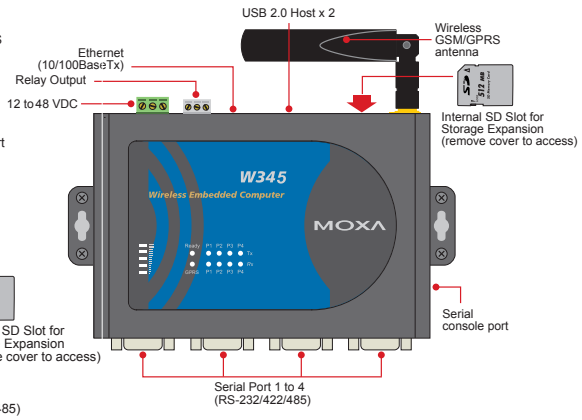
W315



W325



W345



Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit RISC CPU, 192 MHz

OS (pre-installed): Embedded Linux with MMU support

DRAM:
W315/325: 32 MB
W345: 64 MB

Flash: 16 MB

USB: (W345 only) USB 2.0 compliant hosts x 2, type A connector

Relay Output: (W345 only)
- Form C, SPDT x 1
- Normal Switching Capacity: 2A @30 VDC
- Switching Power: 60 W max.
- Switching Voltage: 220 VDC max.
- Switching Current: 2 A max.
- Operating Time: 4 ms @ 20°C
- Initial Contact Resistance: 100 milli-ohm max.

Storage Expansion: SD slot

Ethernet Interface

LAN: 1 auto-sensing 10/100 Mbps port (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Cellular Interface

Cellular Modes: GSM, GPRS

Radio Frequency Bands: 850/900/1800/1900 MHz

GPRS Class: 10

Coding Schemes: CS1 to CS4

Serial Interface

Serial Standards: 1, 2, or 4 RS-232/422/485 ports, software-selectable (DB9 male)

EDS Protection: 15 KV ESD protection for all signals

Console Port: RS-232 interface (TxD, RxD, GND), with 4-pin pin header output

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC™ (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

LEDs

System:
W315: Ready
W325: Ready, SD
W345: Ready, SD

LAN: 10M/Link, 100M/Link (on connector)

Cellular: GPRS Enabled, GSM Signal Strength

Serial: TxD, RxD

Switches and Buttons

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: Aluminum (1 mm)

Weight:
W315/325: 195 g
W345: 400 g

Dimensions: (without ears or antenna)
W315: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
W325: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
W345: 150 x 100 x 38 mm (5.91 x 3.94 x 1.50 in)

Mounting: DIN-rail (requires optional DK-35A DIN-rail kit), wall

Antenna Length: 110 mm

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 80°C (-4 to 176°F)

Anti-vibration: 5 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 50 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
W315/325: 4.8 W
- 400 mA @ 24 VDC
- 400 mA @ 12 VDC

W345:
With no load on USB ports: 7.2 W
- 300 mA @ 24 VDC
- 600 mA @ 12 VDC

With full load on USB ports: 14.4 W
- 600 mA @ 24 VDC
- 1200 mA @ 12 VDC

Regulatory Approvals

EMC: FCC: Part 15, Part 24/24

R&TTE: EN301 489-1, EN301 489-7, EN301 511

Safety: LVD (EN60950-1)

Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock) with battery backup

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Software Specifications

Linux

Kernel Version: 2.6.9

Boot Loader: Redboot

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/ 2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

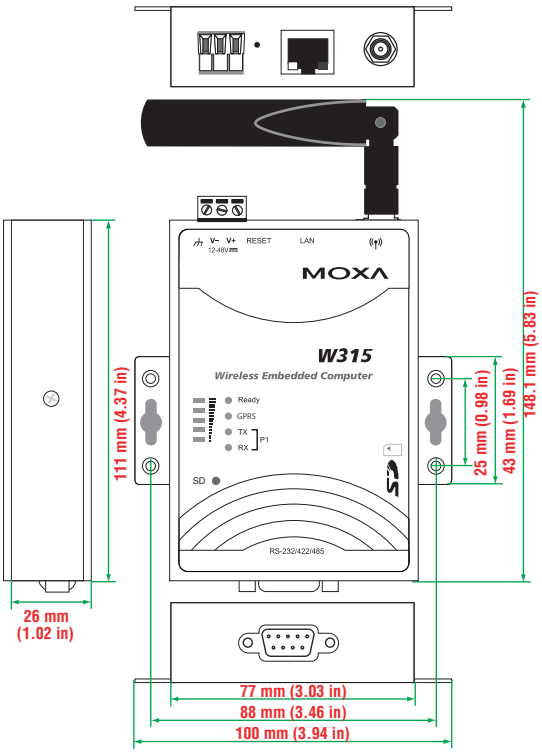
Application Development Environment:
- MOXA Linux API Library
- Linux Tool Chain: Gcc, Glibc, GDB
- BINEncryptor: Encryption tool for binary files, based on “Moxa Intellectual Protection Technology” (Patented)

Device Drivers:
W311: UART, RTC, Buzzer, SD Card
W321: UART, RTC, Buzzer, SD Card
W341: UART, RTC, Buzzer, SD Card, USB (supports USB flash disk), DO

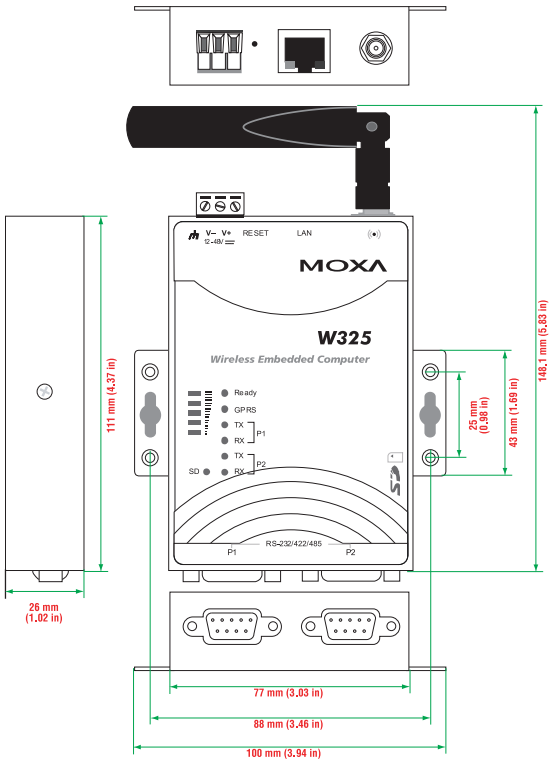
Software Encryption Lock:
BINEncryptor: Encryption tool for binary files (based on patented Moxa technology)

Dimensions

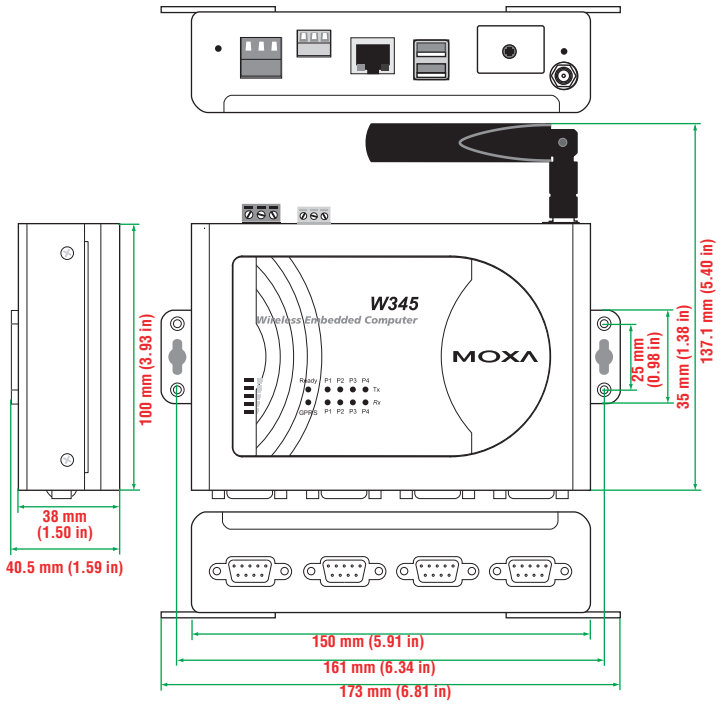
W315



W325



W345



Ordering Information

Available Models

W315-LX: Mini RISC-based wireless Linux computer with GSM/GPRS, 1 serial port, and LAN, and SD

W325-LX: Mini RISC-based wireless Linux computer with GSM/GPRS, 2 serial ports, LAN, and SD

W345-LX: RISC-based wireless Linux computer with GSM/GPRS, 4 serial ports, LAN, SD, USB, and relay output

Package Checklist

- W315 or W325 or W345 computer
- Wall mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adaptor (including terminal block to power jack converter)
- GSM/GPRS Antenna
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

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Accessories

Connection Boxes and Cables for Serial Devices

Serial Connection Options A-2
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Power Adaptors. A-8
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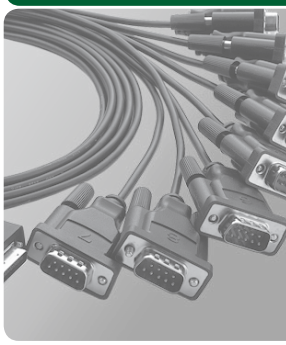
Fiber Optic Adaptors A-10

Mounting Kits

Mounting Kits A-11

A

Accessories

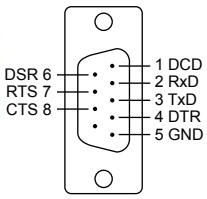


Serial Connection Options

Connection Box & Connection Cable Usage Chart	Connection Boxes								Connection Cables														
	8-port								8-port						4-port							2-port		
	OPT8-M9	OPT8-RJ45	OPT8A/B/S	OPT8F/K/Z	OPT8-M9+	OPT8A+/B+/S+	OPT8F+/K+/Z+	OPT8-RJ45+	CBL-M68M25x8-100 (OPT8C+)	CBL-M68M9x8-100 (OPT8D+)	CBL-M62M25x8-100 (OPT8C)	CBL-M62M9x8-100 (OPT8D)	CBL-M78M25x8-100	CBL-M78M9x8-100	CBL-M44M9x4-50	CBL-M44M9x4-50(POS)	CBL-M44M25x4-50	CBL-M37M9x4-30 (OPT4C)	CBL-M37M9x4-30 (OPT4D)	CBL-F40M9x4-50	CBL-F40M25x4-50	CBL-M25M9x2-50	CBL-F20M9x2-50	CBL-F20M25x2-50
C218Turbo Series	√	√	√	√	-	-	-	-	-	-	√	√	-	-	-	-	-	-	-	-	-	-	-	-
C104H Series	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	√	-	-	-	-	-
CP-114 Series	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	√	-	-	-	-	-
CI-134 Series	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	√	-	-	-	-	-
CP-118U	√	√	√	-	-	-	-	-	-	-	√	√	-	-	-	-	-	-	-	-	-	-	-	-
CP-138U	√	√	√	-	-	-	-	-	-	-	√	√	-	-	-	-	-	-	-	-	-	-	-	-
CP-168U	√	√	√	√	-	-	-	-	-	-	√	√	-	-	-	-	-	-	-	-	-	-	-	-
C168H Series	√	√	√	√	-	-	-	-	-	-	√	√	-	-	-	-	-	-	-	-	-	-	-	-
CP-104UL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	√	-	-	-	-	-	-	-
CP-134U Series	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	√	-	-	-	-	-	-	-
CP-114UL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	√	-	-	-	-	-	-	-
CP-114UL-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	√	-	-	-	-	-	-	-
CP-104EL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	√	-	-	-	-	-	-	-
CP-114EL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	√	-	-	-	-	-	-	-
CP-114EL-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	√	-	-	-	-	-	-	-
CP-112UL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	-
CP-112UL-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	-
CP-132UL Series	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	-
CP-102UL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	-
CP-102EL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	-
CP-132EL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	-
CP-132EL-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	-
CP-118EL	-	-	-	-	√	√	---	√	√	√	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CP-168EL	-	-	-	-	√	√	√	√	√	√	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CP-118U-I	-	-	-	-	-	-	-	-	-	-	-	-	√	√	-	-	-	-	-	-	-	-	-	-
CP-138U-I	-	-	-	-	-	-	-	-	-	-	-	-	√	√	-	-	-	-	-	-	-	-	-	-
POS-104UL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	-	-	-	-	-	-	-
CA-108	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	√	-	-
CB-108	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	√	-	-
CA-114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	√	-	-
CB-114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	√	-	-
CA-134I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	√	-	-
CB-134I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	√	-	-
CA-104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	√	-	-
CA-132	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	√
CA-132I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	√

8-port RS-232 Connection Boxes

OPT8-M9



Connector Types

Board-side: DB62 male x 1

Device-side: DB9 male x 8

Specifications

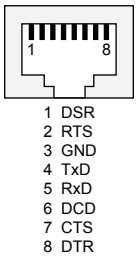
LEDs: TxD, RxD indicators for each device-side port

Dimensions: 90 x 110 x 27 mm (3.5 x 4.3 x 1.1 in)

Included Accessories

Connection Cable: DB62 male to DB62 female 150 cm connection cable for connecting to the serial board

OPT8-RJ45



Connector Types

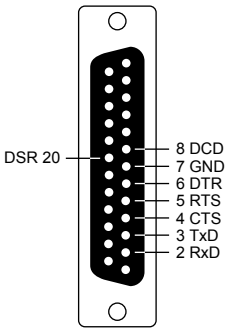
Board-side: DB62 male x 1

Device-side: 8-pin RJ45 x 8

Cable Length

30 cm

OPT8A/S



Connector Types

Board-side: DB62 male x 1

Device-side: DB25 female x 8

Specifications

LEDs: TxD, RxD for each device-side port

Baudrate: 50 bps to 921.6 Kbps

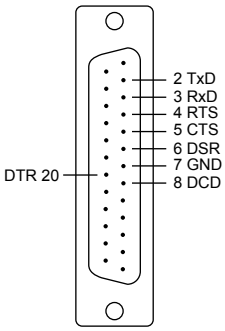
Dimensions: 247 x 108 x 35 mm (9.7 x 4.3 x 1.4 in)

Protection: 25 KV ESD, 2 KV EFT surge protection (Opt8S only)

Included Accessories

Connection Cable: DB62 male to DB62 female 150 cm connection cable for connecting to the serial board

OPT8B



Connector Types

Board-side: DB62 male x 1

Device-side: DB25 male x 8

Specifications

LEDs: TxD, RxD indicators for each device-side port

Baudrate: 50 bps to 921.6 Kbps

Dimensions: 247 x 108 x 35 mm (9.7 x 4.3 x 1.4 in)

Included Accessories

Connection Cable: DB62 male to DB62 female 150 cm connection cable for connecting to the serial board

8-port RS-422 Connection Boxes

OPT8F/Z

Connector Types

Board-side: DB62 male x 1

Device-side: DB25 female x 8

Specifications

LEDs: TxD, RxD indicators for each device-side port

Baudrate: 50 bps to 115.2 Kbps

Dimensions: 247 x 108 x 35 mm (9.7 x 4.3 x 1.4 in)

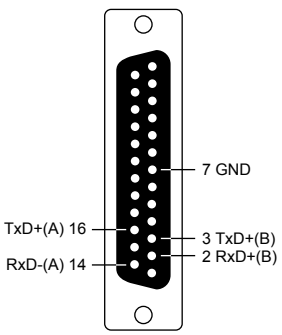
Optical Isolation: 500 V (Opt8F only)

Power Consumption: 0.8 A max. @ 5 VDC

Included Accessories

Connection Cable: DB62 male to DB62 female 150 cm connection cable for connecting to the serial board

Power Adaptor: 100/110/220 VAC



8-port RS-422/485 Connection Boxes

OPT8K

Connector Types

Board-side: DB62 male x 1

Device-side: DB25 female x 8

Specifications

LEDs: TxD, RxD indicators for each device-side port

Baudrate: 50 bps to 230.4 Kbps

Dimensions: 247 x 108 x 35 mm (9.7 x 4.3 x 1.4 in)

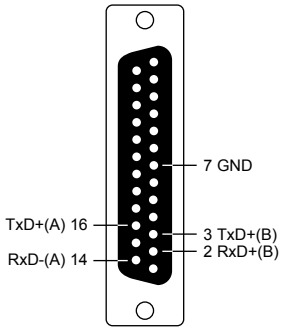
Protection: 16 KV ESD, 1 KV EFT surge protection

Power Consumption: 0.3 A max. @ 12 VDC

Included Accessories

Connection Cable: DB62 male to DB62 female 150 cm connection cable for connecting to the serial board

Power Adaptor: 110/230 VAC



8-port RS-232 Connection Cables

CBL-M62M25x8-100 (OPT8C)

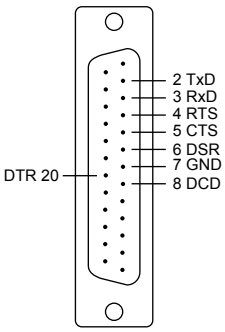
Connector Types

Board-side: DB62 male x 1

Device-side: DB25 male x 8

Cable Length

100 cm



CBL-M62M9x8-100 (OPT8D)

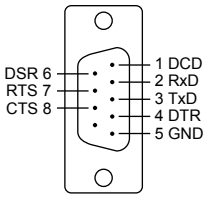
Connector Types

Board-side: DB62 male x 1

Device-side: DB9 male x 8

Cable Length

100 cm



CBL-M68M25x8-100 (OPT8C+)

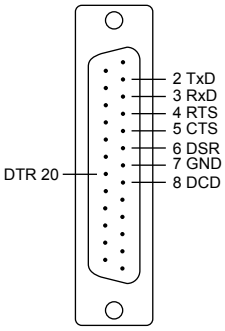
Connector Types

Board-side: VHDCI 68 x 1

Device-side: DB25 male x 8

Cable Length

100 cm



CBL-M68M9x8-100 (OPT8D+)

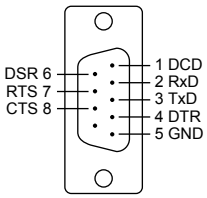
Connector Types

Board-side: VHDCI 68 x 1

Device-side: DB9 male x 8

Cable Length

100 cm



CBL-M78M25x8-100

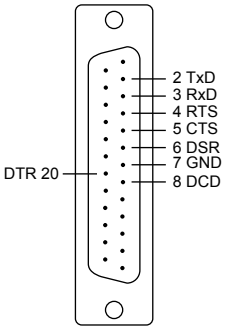
Connector Types

Board-side: DB78 male x 1

Device-side: DB25 male x 8

Cable Length

100 cm



CBL-M78M9x8-100

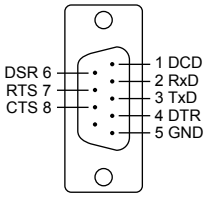
Connector Types

Board-side: DB78 male x 1

Device-side: DB9 male x 8

Cable Length

100 cm

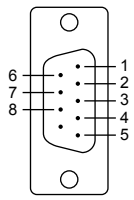


4-port Connection Cables

CBL-F40M9x4-50

40-pin box header to 4-port DB9 male cable

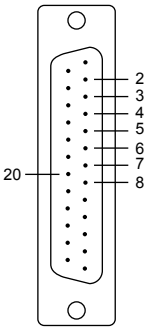
PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	TxD-(A)	---
2	RxD	TxD+(B)	TxD+(B)	---
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	RxD-(A)	Data-(A)
5	GND	GND	GND	GND
6	DSR	---	---	---
7	RTS	---	---	---
8	CTS	---	---	---
9	---	---	---	---



CBL-F40M25x4-50

40-pin box header to 4-port DB25 male cable

PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	TxD+(B)	---
4	RTS	---	---	---
5	CTS	---	---	---
6	DSR	---	---	---
7	GND	GND	GND	GND
8	DCD	TxD-(A)	TxD-(A)	---
20	DTR	RxD-(A)	RxD-(A)	Data-(A)
22	---	---	---	---

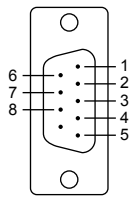


2-port Connection Cables

CBL-F20M9x2-50

20-pin box header to 2-port DB9 male cable

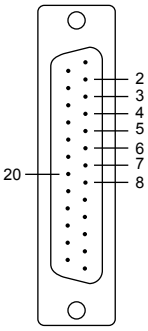
PIN	RS-422	RS-485-4w	RS-485-2w
2	RxD+(B)	RxD+(B)	Data+(B)
3	TxD+(B)	TxD+(B)	---
4	---	---	---
5	---	---	---
6	---	---	---
7	GND	GND	GND
8	TxD-(A)	TxD-(A)	---
20	RxD-(A)	RxD-(A)	Data-(A)
22	---	---	---



CBL-F20M25x2-50

20-pin box header to 2-port DB25 male cable

PIN	RS-422	RS-485-4w	RS-485-2w
1	TxD-(A)	TxD-(A)	---
2	TxD+(B)	TxD+(B)	---
3	RxD+(B)	RxD+(B)	Data+(B)
4	RxD-(A)	RxD-(A)	Data-(A)
5	GND	GND	GND
6	---	---	---
7	---	---	---
8	---	---	---
9	---	---	---



10-pin RJ45 to DB9/DB25 Connection Cables

These cables can be used with the following products: C320Turbo Series, CP-204J, CI-104J, A52, A53, A60

CN20030

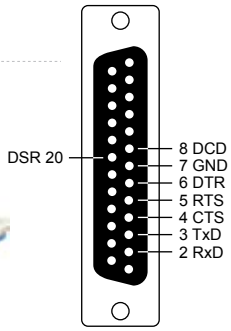
Connector Types

Board-side: 10-pin RJ45 x 1

Device-side: DB25 female x 1

Cable Length

150 cm



CN20060

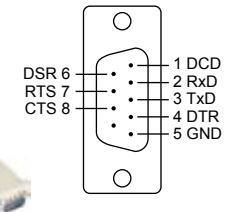
Connector Types

Board-side: 10-pin RJ45 x 1

Device-side: DB9 male x 1

Cable Length

150 cm



CN20040

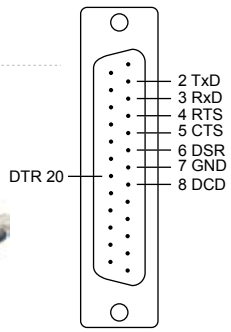
Connector Types

Board-side: 10-pin RJ45 x 1

Device-side: DB25 male x 1

Cable Length

150 cm



CN20070

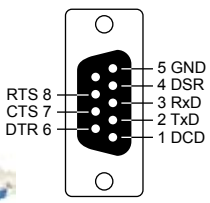
Connector Types

Board-side: 10-pin RJ45 x 1

Device-side: DB9 female x 1

Cable Length

150 cm



8-pin RJ45 to DB9/DB25 Connection Cables

These cables can be used with the following products: CP-104JU, OPT8-RJ45, NPort® 5210, NPort® 5600, NPort® 6600, CN2510/2600, NPort® W2004, UC-7410/7420

CBL-RJ45F25-150

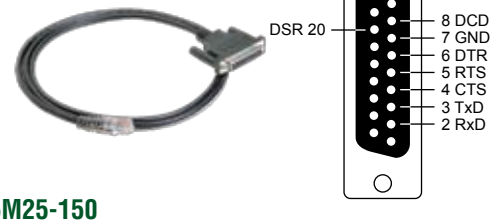
Connector Types

Board-side: 8-pin RJ45 x 1

Device-side: DB25 female x 1

Cable Length

150 cm



CBL-RJ45F9-150

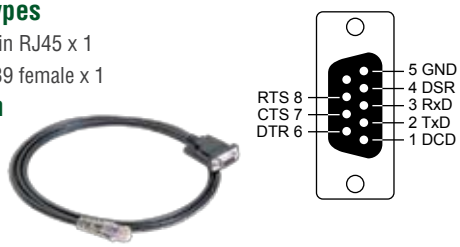
Connector Types

Board-side: 8-pin RJ45 x 1

Device-side: DB9 female x 1

Cable Length

150 cm



CBL-RJ45M25-150

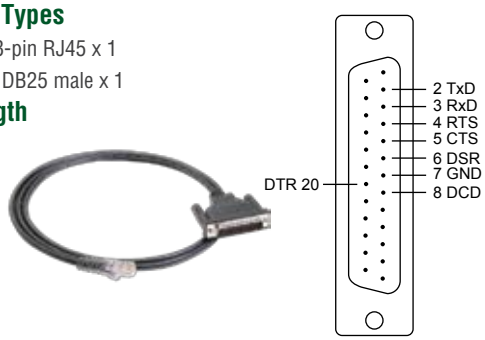
Connector Types

Board-side: 8-pin RJ45 x 1

Device-side: DB25 male x 1

Cable Length

150 cm



CBL-RJ45M9-150

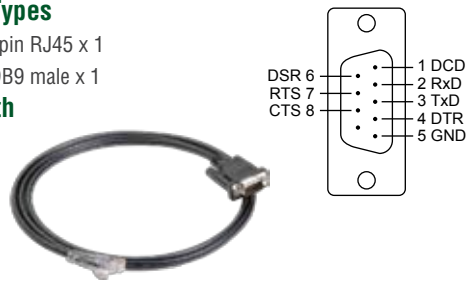
Connector Types

Board-side: 8-pin RJ45 x 1

Device-side: DB9 male x 1

Cable Length

150 cm



CBL-RJ45SF25-150

Cable Type: Shielded

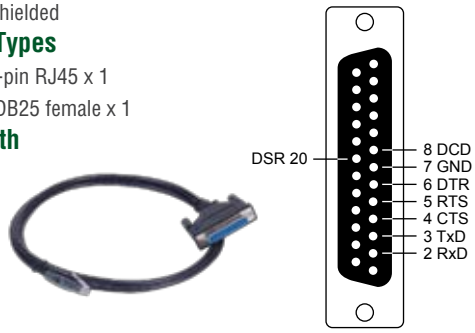
Connector Types

Board-side: 8-pin RJ45 x 1

Device-side: DB25 female x 1

Cable Length

150 cm



CBL-RJ45SF9-150

Cable Type: Shielded

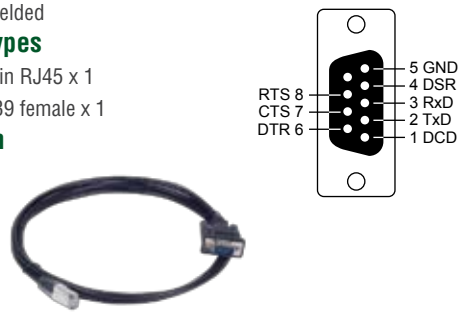
Connector Types

Board-side: 8-pin RJ45 x 1

Device-side: DB9 female x 1

Cable Length

150 cm



CBL-RJ45SM25-150

Cable Type: Shielded

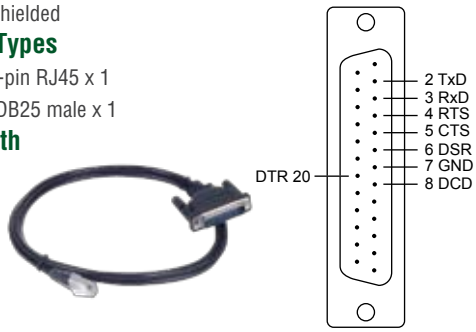
Connector Types

Board-side: 8-pin RJ45 x 1

Device-side: DB25 male x 1

Cable Length

150 cm



CBL-RJ45SM9-150

Cable Type: Shielded

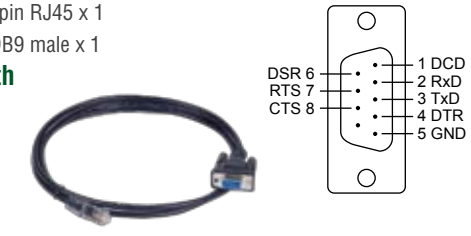
Connector Types

Board-side: 8-pin RJ45 x 1

Device-side: DB9 male x 1

Cable Length

150 cm



Wiring Kits

Wiring Terminals

TB-M9

Type: DB9 male DIN-rail wiring terminal

Use with these products

Device Servers: NPort® DE-311/304/334

Specifications

Connector: DB9 male
Rating: 300 V, 20 A (IEC250V 10A)
Operating Temperature: -40 to 105°C (-40 to 221°F)
Suitable Wiring: 24-12 AWG (IEC 0.5-2.5 mm2)
Dimensions: 77.5 x 45 x 51 mm (3.05 x 1.77 x 2.01 in)

TB-M25

Type: DM25 male DIN-rail wiring terminal

Use with these products

Device Servers: NPort® DE-211
Serial Boards: CP-102UL, CP-132UL-I, CP-102EL, CP-132EL-I, CP-132EL

Specifications

Connector: DB25 male
Rating: 300 V, 20 A (IEC250V 10A)
Operating Temperature: -40 to 105°C (-40 to 221°F)
Suitable Wiring: 24-12 AWG (IEC 0.5-2.5 mm2)
Dimensions: 77.5 x 90 x 51 mm (3.05 x 3.54 x 2.01 in)

3-pin Terminal Block

Model Name: TB-500F-103-5ESDV

Can be used with these products

Device Servers: NPort® 5200/5400

Usage

Power: For connecting to DC power source

7-pin Terminal Block

Model Name: TB-500F-107-5ESDV

Can be used with these products

Device Servers: NPort® 5230/5232

Usage

Data Transmission: For connecting to serial devices

Power Jack to Terminal Block Cable

Model Name: CBL-PJ21OW-10
Type: DB9 male DIN-rail wiring terminal

Specifications

Cable Length: 100±20 mm
Open Wire Length: 7.5±1 mm

RJ45 to DB9 Adaptor

Model Name: ADP-RJ458P-DB9M
Type: RJ45 to DB9 male

TB-F9

Type: DB9 female DIN-rail wiring terminal

Use with these products

Device Servers: NPort® DE-311/304/334
Serial Boards: CI-132 Series, CP-132 Series, CP-102U

Specifications

Connector: DB9 female
Rating: 300 V, 20 A (IEC250V 10A)
Operating Temperature: -40 to 105°C (-40 to 221°F)
Suitable Wiring: 24-12 AWG (IEC 0.5-2.5 mm2)
Dimensions: 77.5 x 45 x 51 mm (3.05 x 1.77 x 2.01 in)

TB-F25

Type: DB25 female DIN-rail wiring terminal

Use with these products

Device Servers: NPort® DE-211

Specifications

Connecctor: DB25 female
Rating: 300 V, 20 A (IEC250V 10A)
Operating Temperature: -40 to 105°C (-40 to 221°F)
Suitable Wiring: 24-12 AWG (IEC 0.5-2.5 mm2)
Dimensions: 77.5 x 90 x 51 mm (3.05 x 3.54 x 2.01 in)

5-pin Terminal Block

Model Name: TB-500F-105-5ESDV

Can be used with these products

Device Servers: NPort® 5230/5232, NPort® 5430, all NPort® IA models

Usage

Data Transmission: For connecting to serial devices

10-pin Terminal Block

Model Name: TB-500F-110-5ESDV

Can be used with these products

Device Servers: All NPort® IA models

Usage

Power and Relay: For connecting to dual DC power sources and relay output

RJ45 to DB9 Adaptor

Model Name: ADP-RJ458P-DB9F
Type: RJ45 to DB9 female

Power Supplies

24/48 VDC power supplies for installation on a DIN-Rail

	24 VDC DIN-Rail Power Supplies					48 VDC DIN-Rail Power Supplies	
	DR-4524	DR-75-24	DR-120-24	MDR-40-24	MDR-60-24	DR-75-48	DR-120-48
Dimensions (mm)	78 x 67 x 93	55.5 x 100 x 125.2	65.5 x 100 x 125.2	40 x 90 x 100	40 x 90 x 100	55.5 x 100 x 125.2	65.5 x 100 x 125.2
Power	45 W	75 W	120 W	40 W	60 W	75 W	120 W
Input	85-264 VAC (47-63 Hz) or 120-370 VDC		88-132 VAC or 176-264 VAC (47-63 Hz) by switch, or 248-370 VDC	85-264 VAC (47-63 Hz) or 120-370 VDC		85-264 VAC (27-63 Hz) or 120-370 VDC	88-132 VAC or 176-264 VAC (47-63 Hz) by switch, or 248-370 VDC
Output	48 W, 24 VDC, 0-2 A	76.8 W, 24 VDC, 0-3.2 A	120 W, 24 VDC, 0-5 A	40 W, 24 VDC, 0-1.7 A	60 W, 24 VDC, 0-2.5 A	76.8 W, 48 VDC, 0-1.6 A	120 W, 48 VDC, 0-2.5 A
Over-voltage Protection	27.6-32.4 V	29-33 V		31.2-36 V		58-65 V	
Overload Protection	105-150%						
Type	Constant Current Limiting						
Reset	Auto Recovery						
Inrush Current	30 A and 115 V, or 60 A and 230 V						
Weight	400 g	550 g	650 g	260 g	280 g	550 g	650 g
Operating Temperature and Relative Humidity	-10 to 50°C (14 to 122°F) at 20 to 90% RH	-10 to 60°C (14 to 140°F) at 20 to 90% RH		-20 to 70°C (-4 to 158°F) at 20 to 90% RH		-10 to 60°C (14 to 140°F) at 20 to 90% RH	
Warranty	3 years						
Safety Standards	TÜV EN60950-1, UL508 Approved						
EMC Standards	CISPR22 (EN55022) Class B, EN61000-4-2/3/4/5/6/8/11, ENV50204, EN61000-3-2, EN50082-2						

Ordering Information

24 VDC DIN-Rail Power Supplies

DR-4524: 45W/2A DIN-Rail 24 VDC power supply with universal 85 to 264 VAC input, -10 to 50°C operating temperature

DR-75-24: 75W/3.2A DIN-Rail 24 VDC power supply with universal 85 to 264 VAC input, -10 to 60°C operating temperature

DR-120-24: 120W/5A DIN-Rail 24 VDC power supply with universal 88 to 132 VAC or 176 to 264 VAC input by switch, -10 to 60°C operating temperature

MDR-40-24: 40W/1.7A DIN-Rail 24 VDC power supply with universal 85 to 264 VAC input, -20 to 70°C operating temperature

MDR-60-24: 60W/2.5A DIN-Rail 24 VDC power supply with universal 85 to 264 VAC input, -20 to 70°C operating temperature

48 VDC DIN-Rail Power Supplies

DR-75-48: 75W/1.6A DIN-Rail 48 VDC power supply with universal 85 to 264 VAC input, -10 to 60°C operating temperature

DR-120-48: 120W/2.5A DIN-Rail 48 VDC power supply with universal 88 to132 VAC or 176 to 264 VAC input by switch, -10 to 60°C operating temperature

Power Adaptors

The following power adaptors can be used with these products: NPort® DE-211/311, NPort® 5100/5200/5400/6150/6250/6450, NPort® W2004, NPort® 2150/2250 Plus, UC-7110/7410/7420, VPort 251

	PWR-12150-CN-S1	PWR-12120-USJP-S2	PWR-12120-DT-S2	PWR-12200-DT-S1	PWR-12042-US-S2	PWR-12042-EU-S1
Input Rating						
I/P	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz
Input Plug						
Plug Type	CN	US/JP	---	---	US	Euro
Output Rating						
O/P	1.5 A @ 12 VDC	1.2 A @ 12 VDC	1.2 A @ 12 VDC	2 A @ 12 VDC	420 mA @ 12 VDC	420 mA @ 12 VDC
Output Plug						
Connector Type	L-type 5.5/2.1/9.0	L-type 5.5/2.1/9.5	S-type 5.5/2.1/7.5	S-type 5.5/2.1/7.5	L-type 5.5/2.1/9.0	L-type 5.5/2.1/9.0
Outer Diameter	5.5 ± 0.1 mm	5.5 ± 0.1 mm	5.5 ± 0.1 mm	5.5 ± 0.1 mm	5.5 ± 0.1 mm	5.5 ± 0.1 mm
Inner Diameter	2.1 ± 0.1 mm	2.1 ± 0.1 mm	2.1 ± 0.1 mm	2.1 ± 0.1 mm	2.1 ± 0.1 mm	2.1 ± 0.1 mm
Physical Characteristics						
Dimensions	70 x 45 x 54 mm	75 x 34 x 72 mm	80 x 49.5 x 30 mm	110.8 x 51.8 x 32 mm	62 x 29 x 66 mm	62 x 29 x 78 mm
Weight	200 g	130 g	124.5 g	200 g	85 g	90 g
Cord Length	1800 ± 200 mm	1830 to 1950 mm	1830 mm (minimum)	1800 ± 200 mm	1830 ± 150 mm	1830 ± 150 mm
Environmental Limits						
Operating Temperature	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)
Regulatory Approvals						
Safety	UL/PSE	UL/PSE	UL/CE/FCC/ TÜV/PSE/SAA	UL/CE/FCC/ GS/CCC	UL/FCC	CE/TÜV

	PWR-12042-UK-S1	PWR-12040-AU-S1	PWR-12120-AU-S2	PWR-12150-EU-S2	PWR-12150-UK-S2	PWR-12200-DT-S2
Input Rating						
I/P	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz
Input Plug						
Plug Type	Euro	AU	AU	Euro	UK	---
Output Rating						
O/P	420 mA @ 12 VDC	400 mA @ 12 VDC	1.2 A @ 12 VDC	1.5 A @ 12 VDC	1.5 A @ 12 VDC	2 A @ 12 VDC
Output Plug						
Connector Type	L-type 5.5/2.1/9.0	L-type 5.5/2.1/9.0	L-type 5.5/2.1/9.0	L-type 5.5/2.1/9.0	L-type 5.5/2.1/9.0	L-type 5.5/2.1/7.5
Outer Diameter	5.5 ± 0.1 mm	5.5 ± 0.1 mm	5.5 ± 0.1 mm	5.5 ± 0.1 mm	5.5 ± 0.1 mm	5.5 ± 0.1 mm
Inner Diameter	2.1 ± 0.1 mm	2.1 ± 0.1 mm	2.1 ± 0.1 mm	2.1 ± 0.1 mm	2.1 ± 0.1 mm	2.1 ± 0.1 mm
Physical Characteristics						
Dimensions	65 x 48 x 72 mm	64.2 x 40.3 x 62.24 mm	75 x 41 x 64.94 mm	70 x 45 x 66.5 mm	70 x 45 x 60 mm	110 x 60 x 34 mm
Weight	105 g	93 g	150 g	200 g	200 g	200 g
Cord Length	1830 ± 150 mm	1500 ± 100 mm	1500 ± 100 mm	1800 ± 200 mm	1800 ± 200 mm	1800 ± 100 mm
Environmental Limits						
Operating Temperature	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)
Regulatory Approvals						
Safety	CE	SAA	SAA/CE	FCC/ELT/PSE/ CE	CE/GS/FCC/ PSE/ETL	CE/GS/FCC/ PSE/UL

Power Cords

The following power adaptors can be used with these products: CN2510, CN2600 Series, NPort® 5600 Series, NPort® 6600 Series

PWC-C13US-3B-183

US Plug (110 V)
Thickness: 6.8 mm
Max. Current: 10 A
Length: 1830 mm

PWC-C13EU-2B-183

Euro Plug (250 V)
Thickness: 6.8 mm
Max. Current: 10 A
Length: 1830 mm

PWC-C13UK-3B-183

UK Plug (250 V)
Thickness: 6.8 mm
Max. Current: 5 A
Length: 1830 mm

PWC-C13JP-3B-183

Japan Plug (125 V)
Thickness: 7.0 mm
Max. Current: 7 A
Length: 1830 mm

PWC-C13AU-3B-183

AU Plug (250 V)
Thickness: 6.0 mm
Max. Current: 10 A
Length: 1830 mm

PWC-C13CN-3B-183

CN Plug (250 V)
Thickness: 6.0 mm
Max. Current: 10 A
Length: 1830 mm

TK-485 Tuning Kit

Pull high/low resistance tuner with termination resistor

The TK-485, which has both a termination resistor and tuning resistor, is a great tool for engineers who build networks of daisy-chained 2-wire RS-485 devices. You no longer need to open up your RS-485 devices to add a termination resistor, and then add another resistor to tune the pull high/low resistance. Instead, simply connect the TK-485 to your RS-485 network, activate the termination resistor, and then tune the pull high/low resistor on the TK-485 until the RS-485 signal is transmitted intact.

Specifications

Serial Protection

Isolation: 2 KV isolation protection
ESD Protection: ±4 KV protection from ESD due to contact discharge

Power Requirements

Power Input:
• 12 to 48 VDC input through power jack
• ±12 to ±48 VDC input through terminal block, with polarity protection

Resistance Options

Pull High: 600 Ω, 1 KΩ, 2 KΩ, 4.7 KΩ, 10 KΩ
Pull Low: 600 Ω, 1 KΩ, 2 KΩ, 4.7 KΩ, 10 KΩ
Terminator: 120 Ω

Connectors

Signal Inputs: D+, D-, GND
Signal Outputs: D+, D-, GND

Environmental Limits

Operating Temperature: 0 to 55°C
Operating Humidity: 95% RH max., non-condensing
Storage Temperature: -20 to 70°C

Fiber Optic Adaptors

ADP-SCm-STf-S

Type: SC male to ST female duplex adaptor for single-mode fiber

Fiber Optic Cable

Single-mode: 9/125 µm
Ferrules and Sleeves: Zirconia Ceramic
Body Color: Blue
Insertion Loss: 0.5/1.1 (TYP/MAX)

Connectors

SC-side: SC male connector
ST-side: ST female connector

ADP-SCm-STf-M

Type: SC male to ST female duplex adaptor for multi-mode fiber

Fiber Optic Cable

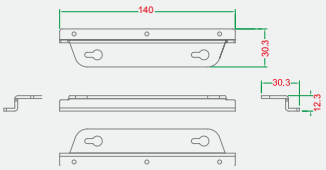
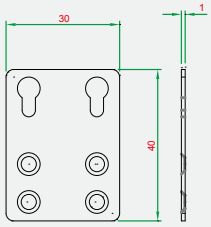
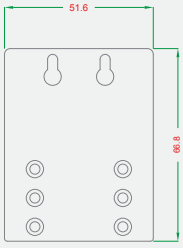
Multi-mode: 62.5/125 µm
Ferrules and Sleeves: Zirconia Ceramic
Body Color: Gray
Insertion Loss: 0.1/0.3 (TYP/MAX)

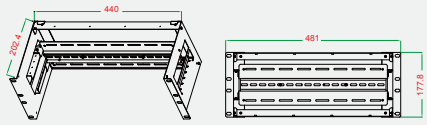
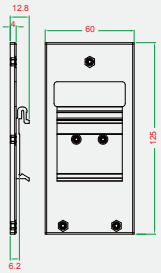
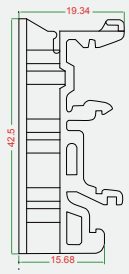
Connectors

SC-side: SC male connector
ST-side: ST female connector

Mounting Kits

Wall mounting, rack mounting, and DIN-Rail mounting kits

	WK-32 Wall Mounting Kit	WK-30 Wall Mounting Kit	WK-46 Wall Mounting Kit
Mounting Kit			
Matched Products	**Modular Ethernet Switch:** EDS-828/728 series	**Unmanaged Ethernet Switch:** EDS-205A/G205 series	**Managed Ethernet Switch:** EDS-G509/500A/400A and EDS-P510 series **Unmanaged Ethernet Switch:** EDS-G308/P308/316/309/308/305/205A/208A series **Wireless AP/Bridge/AP Client:** AWK-3121/1100 series **Media Converter:** IMC-101G/101 series **Video Server:** VPort 354/351/3310/D351 series
Dimensions (W x H x D)	 30.3 x 140 x 12.3 mm	 40 x 30 x 1 mm	 51.6 x 66.8 x 1 mm

	RK-4U 19” Rack Mounting Kit	DK-M12-305 DIN-Rail Mounting Kit	DK-35A DIN-Rail Mounting Kit
Mounting Kit			
Matched Products	**Managed Ethernet Switch:** EDS-G509/500A/400A and EDS-P510 series **Unmanaged Ethernet Switch:** EDS-G308/P308/316/309/308/305/200A/200 series **Wireless AP/Bridge/AP Client:** AWK-3121/1100 series **Media Converter:** IMC-101G/101/21 series **Video Server:** VPort 354/351/3310/D351 series	**Unmanaged Ethernet Switch:** EDS-305-M12 series	**Video Server:** VPort 251/2141 series
Dimensions (W x H x D)	 481 x 177.8 x 202.4 mm	 60 x 125 x 12.8 mm	 42.5 x 10 x 19.34 mm

Ordering Information

Available Models

WK-32: Wall mounting kit for the EDS-728/828 series
WK-30: Wall mounting kit for the EDS-205A/G205A series
WK-46: Wall mounting kit
RK-4U: 4U-high 19” rack mounting kit
DK-M12-305: DIN-Rail mounting kit for the EDS-305-M12 series
DK-35A: DIN-Rail mounting kit for the VPort 251/2141 series

Ordering Information

A

ABC-01	Page 3-48
ABC-01	Configuration backup and restoration tool for managed Ethernet switches (plugs directly into the switch's RS-232 console port), 0 to 60°C operating temperature

ADP-SCm-STf-x Series Fiber Optic Adaptors	Page A-11
ADP-SCm-STf-S	SC male to ST female duplex adaptor for single-mode fiber
ADP-SCm-STf-M	SC male to ST female duplex adaptor for multi-mode fiber

AWK-3121	Page 13-22
AWK-3121-US	IEEE 802.11a/b/g wireless AP/Bridge/Client, US band, 0 to 60°C operating temperature
AWK-3121-EU	IEEE 802.11a/b/g wireless AP/Bridge/Client, EU band, 0 to 60°C operating temperature
AWK-3121-JP	IEEE 802.11a/b/g wireless AP/Bridge/Client, JP band, 0 to 60°C operating temperature
AWK-3121-US-T	IEEE 802.11a/b/g wireless AP/Bridge/Client, US band, -40 to 75°C operating temperature
AWK-3121-EU-T	IEEE 802.11a/b/g wireless AP/Bridge/Client, EU band, -40 to 75°C operating temperature
AWK-3121-JP-T	IEEE 802.11a/b/g wireless AP/Bridge/Client, JP band, -40 to 75°C operating temperature

AWK-4121	Page 13-18
AWK-4121-US-T	IEEE 802.11a/b/g outdoor wireless AP/Bridge/Client, US band, -40 to 75°C operating temperature
AWK-4121-EU-T	IEEE 802.11a/b/g outdoor wireless AP/Bridge/Client, EU band, -40 to 75°C operating temperature
AWK-4121-JP-T	IEEE 802.11a/b/g outdoor wireless AP/Bridge/Client, JP band, -40 to 75°C operating temperature

AWK-5222	Page 13-20
AWK-5222-US	IEEE 802.11a/b/g dual-RF AP/Bridge/Client, US band, 0 to 60°C operating temperature
AWK-5222-EU	IEEE 802.11a/b/g dual-RF AP/Bridge/Client, EU band, 0 to 60°C operating temperature
AWK-3222-JP	IEEE 802.11a/b/g dual-RF AP/Bridge/Client, JP band, 0 to 60°C operating temperature
AWK-5222-US-T	IEEE 802.11a/b/g dual-RF AP/Bridge/Client, US band, -40 to 75°C operating temperature
AWK-5222-EU-T	IEEE 802.11a/b/g dual-RF AP/Bridge/Client, EU band, -40 to 75°C operating temperature
AWK-5222-JP-T	IEEE 802.11a/b/g dual-RF AP/Bridge/Client, JP band, -40 to 75°C operating temperature

AWK-6222	Page 13-16
AWK-6222-US-T	IEEE 802.11a/b/g outdoor dual-RF AP/Bridge/Client, US band, -40 to 75°C operating temperature
AWK-6222-EU-T	IEEE 802.11a/b/g outdoor dual-RF AP/Bridge/Client, EU band, -40 to 75°C operating temperature
AWK-6222-JP-T	IEEE 802.11a/b/g outdoor dual-RF AP/Bridge/Client, JP band, -40 to 75°C operating temperature

C

C104H/HS	Page 10-66
C104H	4-port RS-232 ISA serial board
C104H-DB9M	4-port RS-232 ISA serial board (includes DB9 male cable)
C104H-DB25M	4-port RS-232 ISA serial board (includes DB25 male cable)
C104HS	4-port RS-232 ISA serial board with surge protection
C104HS-DB9M	4-port RS-232 ISA serial board with surge protection (includes DB9 male cable)
C104HS-DB25M	4-port RS-232 ISA serial board with surge protection (includes DB25 male cable)

CA-108	Page 10-71
CA-108	8-port RS-232 PC/104 module, 0 to 55°C operating temperature
CA-108-T	8-port RS-232 PC/104 module, -40 to 85°C operating temperature

CA-114	Page 10-72
CA-114	4-port RS-232/422/485 PC/104 module, 0 to 55°C operating temperature
CA-114-T	4-port RS-232/422/485 PC/104 module, -40 to 85°C operating temperature

CA-132/132I	Page 10-75
CA-132	2-port RS-422/485 PC/104 module, 0 to 55°C operating temperature
CA-132I	2-port RS-422/485 PC/104 module with optical isolation protection, 0 to 55°C operating temperature
CA-132-T	2-port RS-422/485 PC/104 module, -40 to 85°C operating temperature
CA-132I-T	2-port RS-422/485 PC/104 module with optical isolation protection, -40 to 85°C operating temperature

CA-134I	Page 10-73
CA-134I	4-port RS-422/485 PC/104 module with optical isolation, 0 to 55°C operating temperature
CA-134I-T	4-port RS-422/485 PC/104 module with optical isolation, -40 to 85°C operating temperature

CB-108	Page 10-76
CB-108	8-port RS-232 PC/104-Plus module, 0 to 55°C operating temperature
CB-108-T	8-port RS-232 PC/104-Plus module, -40 to 85°C operating temperature

CB-114	Page 10-77
CB-114	4-port RS-232/422/485 PC/104 module, 0 to 55°C operating temperature
CB-114-T	4-port RS-232/422/485 PC/104 module, -40 to 85°C operating temperature

CB-134I	Page 10-78
CB-134I	4-port RS-422/485 PC/104-Plus module with optical isolation protection, 0 to 55°C operating temperature
CB-134I-T	4-port RS-422/485 PC/104-Plus module with optical isolation protection, -40 to 85°C operating temperature

CBL-RJ45xxx Series Connection Cables	Page A-6
CBL-RJ45F25-150	8-pin RJ45 to DB25 female connection cable
CBL-RJ45F9-150	8-pin RJ45 to DB9 female connection cable
CBL-RJ45M25-150	8-pin RJ45 to DB25 male connection cable
CBL-RJ45M9-150	8-pin RJ45 to DB9 male connection cable
CBL-RJ45SF25-150	Shielded 8-pin RJ45 to DB25 female connection cable
CBL-RJ45SF9-150	Shielded 8-pin RJ45 to DB9 female connection cable
CBL-RJ45SM25-150	Shielded 8-pin RJ45 to DB25 male connection cable
CBL-RJ45SM9-150	Shielded 8-pin RJ45 to DB9 male connection cable

CBL-xxx Series 2-port Connection Cables	Page A-5
CBL-F20M9x2-50	20-pin box header to 2-port DB9 male cable, 50 cm
CBL-F20M25x2-50	20-pin box header to 2-port DB25 male cable, 50 cm

CBL-xxx Series 4-port Connection Cables	Page A-5
CBL-F40M9x4-50	40-pin box header to 4-port DB9 male cable, 50 cm
CBL-F40M25x4-50	40-pin box header to 4-port DB25 male cable, 50 cm

CBL-xxx Series 8-port Connection Cables	Page A-4
CBL-M62M25x8-100 (OPT8C)	8-port connection cable (board-side: DB62 male x 1; device-side: DB25 male x 8), 100 cm
CBL-M62M9x8-100 (OPT8D)	8-port connection cable (board-side: DB62 male x 1; device-side: DB9 male x 8), 100 cm
CBL-M68M25x8-100 (OPT8C+)	8-port connection cable (board-side: VHDCI68 x 1; device-side: DB25 male x 8), 100 cm
CBL-M68M9x8-100 (OPT8D+)	8-port connection cable (board-side: VHDCI68 x 1; device-side: DB9 male x 8), 100 cm
CBL-M78M25x8-100	8-port connection cable (board-side: DB78 male x 1; device-side: DB25 male x 8), 100 cm
CBL-M78M9x8-100	8-port connection cable (board-side: DB78 male x 1; device-side: DB9 male x 8), 100 cm

CI-132	Page 10-68
CI-132	2-port RS-422/485 ISA serial board
CI-132I	2-port RS-422/485 ISA serial board with optical isolation
CI-132IS	2-port RS-422/485 ISA serial board with optical isolation and surge protection

CI-134	Page 10-67
CI-134-DB9M	4-port RS-422/485 ISA serial board (includes DB9 male cable)
CI-134I-DB9M	4-port RS-422/485 ISA serial board with optical isolation (includes DB9 male cable)
CI-134IS-DB9M	4-port RS-422/485 ISA serial board with optical isolation and surge protection (includes DB9 male cable)

CM-600 Series Interface Modules	Page 3-28
CM-600-4TX	Fast Ethernet interface module with 4 10/100BaseT(X) ports, 0 to 60°C operating temperature
CM-600-4MSC	Fast Ethernet interface module with 4 100BaseFX multi-mode ports (SC connectors), 0 to 60°C operating temperature
CM-600-4MST	Fast Ethernet interface module with 4 100BaseFX multi-mode ports (ST connectors), 0 to 60°C operating temperature
CM-600-4SSC	Fast Ethernet interface module with 4 100BaseFX single-mode ports (SC connectors), 0 to 60°C operating temperature
CM-600-2MSC/2TX	Fast Ethernet interface module with 2 10/100BaseT(X) ports and 2 100BaseFX multi-mode ports (SC connectors), 0 to 60°C operating temperature
CM-600-2MST/2TX	Fast Ethernet interface module with 2 10/100BaseT(X) ports and 2 100BaseFX multi-mode ports (ST connectors), 0 to 60°C operating temperature
CM-600-2SSC/2TX	Fast Ethernet interface module with 2 10/100BaseT(X) ports and 2 100BaseFX single-mode ports (SC connectors), 0 to 60°C operating temperature
CM-600-3MSC/1TX	Fast Ethernet interface module with 1 10/100BaseT(X) ports and 3 100BaseFX multi-mode ports (SC connectors), 0 to 60°C operating temperature
CM-600-3MST/1TX	Fast Ethernet interface module with 1 10/100BaseT(X) ports and 3 100BaseFX multi-mode ports (ST connectors), 0 to 60°C operating temperature
CM-600-3SSC/1TX	Fast Ethernet interface module with 1 10/100BaseT(X) ports and 3 100BaseFX single-mode ports (SC connectors), 0 to 60°C operating temperature

CN200xx Series Connection Cables	Page A-5
CN20030	10-pin RJ45 to DB25 female connection cable
CN20040	10-pin RJ45 to DB25 male connection cable
CN20060	10-pin RJ45 to DB9 male connection cable
CN20070	10-pin RJ45 to DB9 female connection cable

CN2600	Page 7-24
CN2610-8	Dual-LAN terminal server with 8 RS-232 ports
CN2610-16	Dual-LAN terminal server with 16 RS-232 ports
CN2610-8-2AC	Dual-LAN, dual-AC-power terminal server with 8 RS-232 ports
CN2610-16-2AC	Dual-LAN, dual-AC-power terminal server with 16 RS-232 ports
CN2650-8	Dual-LAN terminal server with 8 RS-232/422/485 ports
CN2650-16	Dual-LAN terminal server with 16 RS-232/422/485 ports
CN2650-8-2AC	Dual-LAN, dual-AC-power terminal server with 8 RS-232/422/485 ports
CN2650-16-2AC	Dual-LAN, dual-AC-power terminal server with 16 RS-232/422/485 ports
CN2650I-8	Dual-LAN terminal server with 8 RS-232/422/485 ports and 2 KV optical isolation
CN2650I-16	Dual-LAN terminal server with 16 RS-232/422/485 ports and 2 KV optical isolation
CN2650I-8-2AC	Dual-LAN, dual-AC-power terminal server with 8 RS-232/422/485 ports and 2 KV optical isolation
CN2650I-16-2AC	Dual-LAN, dual-AC-power terminal server with 16 RS-232/422/485 ports and 2 KV optical isolation

CP-102E/EL	Page 10-28
CP-102E	2-port RS-232 PCI Express x1 serial board
CP-102EL-DB9M	2-port RS-232 low profile PCI Express serial board (includes DB9 male cable)

CP-102U/UL	Page 10-56
CP-102U	2-port RS-232 Universal PCI serial board, 0 to 55°C operating temperature
CP-102UL-DB9M	2-port RS-232 low profile Universal PCI serial board, 0 to 55°C operating temperature (includes DB9 male cable)
CP-102U-T	2-port RS-232 Universal PCI serial board, -40 to 85°C operating temperature
CP-102UL-T	2-port RS-232 low profile Universal PCI serial board, -40 to 85°C operating temperature

CP-102UF	Page 10-62
CP-102UF-M-ST	2-port Universal PCI serial over fiber board with multi-mode fiber for 5 km transmission (ST connector), 0 to 55°C operating temperature
CP-102UF-S-ST	2-port Universal PCI serial over fiber board with single-mode fiber for 40 km transmission (ST connector), 0 to 55°C operating temperature
CP-102UF-M-ST-T	2-port Universal PCI serial over fiber board with multi-mode fiber for 5 km transmission (ST connector), -40 to 85°C operating temperature
CP-102UF-S-ST-T	2-port Universal PCI serial over fiber board with single-mode fiber for 40 km transmission (ST connector), -40 to 85°C operating temperature

CP-104EL	Page 10-26
CP-104EL-DB9M	4-port RS-232 low profile PCI Express x1 serial board (includes DB9 male cable)
CP-104EL-DB25M	4-port RS-232 low profile PCI Express x1 serial board (includes DB25 male cable)

CP-104UL/JU	Page 10-50
CP-104UL-DB9M	4-port RS-232 low profile Universal PCI serial board, 0 to 55°C operating temperature (includes DB9 male cable)
CP-104UL-DB25M	4-port RS-232 low profile Universal PCI serial board, 0 to 55°C operating temperature (includes DB25 male cable)
CP-104JU	4-port RS-232 Universal PCI serial board with RJ45 ports on the board, 0 to 55°C operating temperature
CP-104UL-T	4-port RS-232 low profile Universal PCI serial board, -40 to 85°C operating temperature
CP-104JU-T	4-port RS-232 Universal PCI serial board with RJ45 ports on the board, -40 to 85°C operating temperature

CP-112UL/UL-I	Page 10-54
CP-112UL-DB9M	2-port RS-232/422/485 low profile Universal PCI board, 0 to 55°C operating temperature (includes DB9 male cable)
CP-112UL-I-DB9M	2-port RS-232/422/485 low profile Universal PCI board with optical isolation, 0 to 55°C operating temperature (includes DB9 male cable)
CP-112UL-T	2-port RS-232/422/485 low profile Universal PCI board, -40 to 85°C operating temperature
CP-112UL-I-T	2-port RS-232/422/485 low profile Universal PCI board with optical isolation, -40 to 85°C operating temperature

CP-114EL/EL-I	Page 10-24
CP-114EL	4-port RS-232/422/485 low profile PCI Express x1 serial board
CP-114EL-I	4-port RS-232/422/485 low profile PCI Express x1 serial board with optical isolation
CP-114EL-DB9M	4-port RS-232/422/485 low profile PCI Express x1 serial board (includes DB9 male cable)
CP-114EL-DB25M	4-port RS-232/422/485 low profile PCI Express x1 serial board (includes DB25 male cable)
CP-114EL-I-DB9M	4-port RS-232/422/485 low profile PCI Express x1 serial board with optical isolation (includes DB9 male cable)
CP-114EL-I-DB25M	4-port RS-232/422/485 low profile PCI Express x1 serial board with optical isolation (includes DB25 male cable)

CP-118EL	Page 10-20
CP-118EL	8-port RS-232/422/485 low profile PCI Express x1 serial board

CP-118U/138U	Page 10-42
CP-118U	8-port RS-232/422/485 Universal PCI serial board, 0 to 55°C operating temperature
CP-138U	8-port RS-422/485 Universal PCI serial board, 0 to 55°C operating temperature
CP-118U-T	8-port RS-232/422/485 Universal PCI serial board, -40 to 85°C operating temperature
CP-138U-T	8-port RS-422/485 Universal PCI serial board, -40 to 85°C operating temperature

CP-118U-I/138U-I	Page 10-44
CP-118U-I	8-port RS-232/422/485 Universal PCI serial board with optical isolation, 0 to 55°C operating temperature
CP-138U	8-port RS-422/485 Universal PCI serial board with optical isolation, 0 to 55°C operating temperature
CP-118U-I-T	8-port RS-232/422/485 Universal PCI serial board with optical isolation, -40 to 85°C operating temperature
CP-138U-T	8-port RS-422/485 Universal PCI serial board with optical isolation, -40 to 85°C operating temperature

CP-132EL/EL-I	Page 10-30
CP-132EL-DB9M	2-port RS-422/485 low profile PCI Express x1 serial board (includes DB9 male cable)
CP-132EL-I-DB9M	2-port RS-422/485 low profile PCI Express x1 serial board with optical isolation (includes DB9 male cable)

CP-132UL/UL-I	Page 10-58
CP-132UL-DB9M	2-port RS-422/485 low profile Universal PCI serial board, 0 to 55°C operating temperature (includes DB9 male cable)
CP-132UL-I-DB9M	2-port RS-422/485 low profile Universal PCI serial board with optical isolation, 0 to 55°C operating temperature (includes DB9 male cable)
CP-132UL-T	2-port RS-422/485 low profile Universal PCI serial board, -40°C to 85 operating temperature
CP-132UL-I-T	2-port RS-422/485 low profile Universal PCI serial board with optical isolation, -40°C to 85 operating temperature

CP-134U/U-I	Page 10-52
CP-134U	4-port RS-422/485 Universal PCI serial board, 0 to 55°C operating temperature
CP-134U-DB9M	4-port RS-422/485 Universal PCI serial board, 0 to 55°C operating temperature (includes DB9 male cable)
CP-134U-DB25M	4-port RS-422/485 Universal PCI serial board, 0 to 55°C operating temperature (includes DB25 male cable)
CP-134U-I	4-port RS-422/485 Universal PCI serial board with optical isolation, 0 to 55°C operating temperature
CP-134U-I-DB9M	4-port RS-422/485 Universal PCI serial board with optical isolation, 0 to 55°C operating temperature (includes DB9 male cable)
CP-134U-I-DB25M	4-port RS-422/485 Universal PCI serial board with optical isolation, 0 to 55°C operating temperature (includes DB25 male cable)
CP-134U-T	4-port RS-422/485 Universal PCI serial board, -40 to 85°C operating temperature
CP-134U-I-T	4-port RS-422/485 Universal PCI serial board with optical isolation, -40 to 85°C operating temperature

CP-168EL	Page 10-22
CP-168EL	8-port RS-232 low profile PCI Express x1 serial board

CP-168U	Page 10-46
CP-168U	8-port RS-232 Universal PCI serial board, 0 to 55°C operating temperature
CP-168U-T	8-port RS-232 Universal PCI serial board, -40 to 85°C operating temperature

D

DA-660/661/662/662-I	Page 15-56
DA-660-8-LX	RISC-based 19-inch rackmount data acquisition computer with 8 serial ports, dual LANs, Linux OS
DA-660-8-CE	RISC-based 19-inch rackmount data acquisition computer with 8 serial ports, dual LANs, WinCE 5.0 OS
DA-660-16-LX	RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, dual LANs, Linux OS
DA-660-16-CE	RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, dual LANs, WinCE 5.0 OS
DA-661-16-LX	RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, dual LANs, PCMCIA, CompactFlash, USB, Linux OS
DA-661-16-CE	RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, dual LANs, PCMCIA, CompactFlash, USB, WinCE 5.0 OS
DA-662-16-LX	RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, quad LANs, PCMCIA, CompactFlash, USB, Linux OS
DA-662-16-CE	RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, quad LANs, PCMCIA, CompactFlash, USB, WinCE 5.0 OS
DA-662-I-16-LX	RISC-based 19-inch rackmount data acquisition computer with 16 digitally isolated serial ports, quad LANs, PCMCIA, CompactFlash, USB, Linux 2.6
DA-662-I-16-CE	RISC-based 19-inch rackmount data acquisition computer with 16 digitally isolated serial ports, quad LANs, PCMCIA, CompactFlash, USB, WinCE 5.0

DA-681	Page 15-49
DA-681-I-SP-CE	x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Single Power, WinCE 6.0
DA-681-I-SP-XPE	x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Single Power, WinXPe SP2
DA-681-I-SP-LX	x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Single Power, Linux 2.6
DA-681-I-DP-CE	x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Dual Power, WinCE 6.0
DA-681-I-DP-XPE	x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Dual Power, WinXPe SP2
DA-681-I-DP-LX	x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Dual Power, Linux 2.6

DA-682	Page 15-52
DA-682-CE	x86 rackmount computer with VGA, 4 Gigabit Ethernet ports, 2 PCI slots, CompactFlash, USB, WinCE 6.0
DA-682-XPE	x86 rackmount computer with VGA, 4 Gigabit Ethernet ports, 2 PCI slots, CompactFlash, USB, WinXPe
DA-682-LX	x86 rackmount computer with VGA, 4 Gigabit Ethernet ports, 2 PCI slots, CompactFlash, USB, Linux
DA-SP08-I-DB	8-port RS-232/422/485 serial module with DB9 connector and digital isolation
DA-SP08-DB	8-port RS-232/422/485 serial module with DB9 connector
DA-SP08-I-TB	8-port RS-232/422/485 serial module with terminal block connector and digital isolation
DA-LN04-RJ	4-port 10/100 Mbps LAN module
DA-UPCI-DK	Universal PCI development kit

DK-xx Series Mounting Kits	Page A-12
DK-M12-305	DIN-Rail mounting kit for EDS-305-M12 series Ethernet switches
DK-35A	DIN-Rail mounting kit for VPort 251/2141 series video servers
DK-DC50131	DIN-Rail mounting kit for TN-5500 series M12 Ethernet switches (Page 4-9)
DK-44	DIN-Rail mounting kit for TN-5308/5308-4PoE series M12 Ethernet switches (Page 4-11)
	Note: See the RK-xx Series and WK-xx Series Mounting Kits for related products.

DR Series DIN-Rail Power Supplies	Page A-8
DR-4524	45W/2A DIN-Rail 24 VDC power supply with universal 85 to 264 VAC input, -10 to 50°C operating temperature
DR-75-24	75W/3.2A DIN-Rail 24 VDC power supply with universal 85 to 264 VAC input, -10 to 60°C operating temperature
DR-120-24	120W/5A DIN-Rail 24 VDC power supply with universal 88 to 132 VAC or 176 to 264 VAC input by switch, -10 to 60°C operating temperature
DR-75-48	75W/1.6A DIN-Rail 48 VDC power supply with universal 85 to 264 VAC input, -10 to 60°C operating temperature
DR-120-48	120W/2.5A DIN-Rail 48 VDC power supply with universal 88 to 132 VAC or 176 to 264 VAC input by switch, -10 to 60°C operating temperature
	Note: See MDR Series DIN-Rail Power Supplies for related products.

E

EDS-205	Page 3-64
EDS-205	Entry-level unmanaged Ethernet switch with 5 10/100BaseT(X) ports, plastic housing, -10 to 60°C operating temperature

EDS-205A	Page 3-62
EDS-205A	Unmanaged Ethernet switch with 5 10/100BaseT(X) ports, -10 to 60°C operating temperature
EDS-205A-T	Unmanaged Ethernet switch with 5 10/100BaseT(X) ports, -40 to 75°C operating temperature

EDS-208	Page 3-64
EDS-208	Entry-level unmanaged Ethernet switch with 8 10/100BaseT(X) ports, plastic housing, -10 to 60°C operating temperature
EDS-208-M-SC	Entry-level unmanaged Ethernet switch with 7 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port with SC connector, plastic housing, -10 to 60°C operating temperature
EDS-208-M-ST	Entry-level unmanaged Ethernet switch with 7 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port with ST connector, plastic housing, -10 to 60°C operating temperature

EDS-208A	Page 3-62
EDS-208A	Unmanaged Ethernet switch with 8 10/100BaseT(X) ports, -10 to 60°C operating temperature
EDS-208A-M-SC	Unmanaged Ethernet switch with 7 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port with SC connector, -10 to 60°C operating temperature
EDS-208A-M-ST	Unmanaged Ethernet switch with 7 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port with ST connector, -10 to 60°C operating temperature
EDS-208A-MM-SC	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with SC connectors, -10 to 60°C operating temperature
EDS-208A-MM-ST	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with ST connectors, -10 to 60°C operating temperature
EDS-208A-S-SC	Unmanaged Ethernet switch with 7 10/100BaseT(X) ports, and 1 100BaseFX single-mode port with SC connector, -10 to 60°C operating temperature
EDS-208A-SS-SC	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors, -10 to 60°C operating temperature
EDS-208A-T	Unmanaged Ethernet switch with 8 10/100BaseT(X) ports, -40 to 75°C operating temperature
EDS-208A-M-SC-T	Unmanaged Ethernet switch with 7 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port with SC connector, -40 to 75°C operating temperature
EDS-208A-M-ST-T	Unmanaged Ethernet switch with 7 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port with ST connector, -40 to 75°C operating temperature
EDS-208A-MM-SC-T	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with SC connectors, -40 to 75°C operating temperature
EDS-208A-MM-ST-T	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with ST connectors, -40 to 75°C operating temperature
EDS-208A-S-SC-T	Unmanaged Ethernet switch with 7 10/100BaseT(X) ports, and 1 100BaseFX single-mode port with SC connector, -40 to 75°C operating temperature
EDS-208A-SS-SC-T	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors, -40 to 75°C operating temperature

EDS-305	Page 3-59
EDS-305	Unmanaged Ethernet switch with 5 10/100BaseT(X) ports, 0 to 60°C operating temperature
EDS-305-M-SC	Unmanaged Ethernet switch with 4 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port with SC connector, 0 to 60°C operating temperature
EDS-305-M-ST	Unmanaged Ethernet switch with 4 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port with ST connector, 0 to 60°C operating temperature
EDS-305-S-SC	Unmanaged Ethernet switch with 4 10/100BaseT(X) ports, and 1 100BaseFX single-mode port with SC connector, 0 to 60°C operating temperature
EDS-305-S-SC-80	Unmanaged Ethernet switch with 4 10/100BaseT(X) ports, and 1 100BaseFX single-mode port with SC connector for 80 km transmission, 0 to 60°C operating temperature
EDS-305-T	Unmanaged Ethernet switch with 5 10/100BaseT(X) ports, -40 to 75°C operating temperature
EDS-305-M-SC-T	Unmanaged Ethernet switch with 4 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port with SC connector, -40 to 75°C operating temperature
EDS-305-M-ST-T	Unmanaged Ethernet switch with 4 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port with ST connector, -40 to 75°C operating temperature
EDS-305-S-SC-T	Unmanaged Ethernet switch with 4 10/100BaseT(X) ports, and 1 100BaseFX single-mode port with SC connector, -40 to 75°C operating temperature

EDS-305-M12	Page 4-14
EDS-305-M12	Unmanaged IP67-rated Ethernet switch with 5 10/100BaseT(X) ports with M12 connectors, 0 to 60°C operating temperature
EDS-305-M12-T	Unmanaged IP67-rated Ethernet switch with 5 10/100BaseT(X) ports with M12 connectors, -40 to 75°C operating temperature

EDS-305-M12 Series Accessories	Page 4-14
CBL-M12D(MM4P)/RJ45-100 IP67	1-meter M12-to-RJ45 Cat-5E UTP Ethernet cable with waterproof 4-pin D-coded M12 connector
BL-M12(FF5P)/OPEN-100 IP67	1-meter M12-to-5-pin power cable with waterproof 5-pin A-coded M12 connector

M12D-4P-IP68	Field-installable D-coded screw-in sensor connector, male
M12A-5P-IP68	Field-installable A-coded screw-in sensor connector, female

EDS-308	Page 3-59
EDS-308	Unmanaged Ethernet switch with 8 10/100BaseT(X) ports, 0 to 60°C operating temperature
EDS-308-M-SC	Unmanaged Ethernet switch with 7 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port with SC connector, 0 to 60°C operating temperature
EDS-308-MM-SC	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-308-MM-ST	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with ST connector, 0 to 60°C operating temperature
EDS-308-S-SC	Unmanaged Ethernet switch with 7 10/100BaseT(X) ports, and 1 100BaseFX single-mode port with SC connector, 0 to 60°C operating temperature
EDS-308-SS-SC	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-308-S-SC-80	Unmanaged Ethernet switch with 7 10/100BaseT(X) ports, and 1 100BaseFX single-mode port with SC connector for 80 km transmission, 0 to 60°C operating temperature
EDS-308-SS-SC-80	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors for 80 km transmission, 0 to 60°C operating temperature
EDS-308-T	Unmanaged Ethernet switch with 8 10/100BaseT(X) ports, -40 to 75°C operating temperature
EDS-308-M-SC-T	Unmanaged Ethernet switch with 7 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port with SC connector, -40 to 75°C operating temperature
EDS-308-MM-SC-T	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with SC connectors, -40 to 75°C operating temperature
EDS-308-MM-ST-T	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with ST connector, -40 to 75°C operating temperature
EDS-308-S-SC-T	Unmanaged Ethernet switch with 7 10/100BaseT(X) ports, and 1 100BaseFX single-mode port with SC connector, -40 to 75°C operating temperature
EDS-308-SS-SC-T	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors, -40 to 75°C operating temperature
EDS-308-S-SC-80-T	Unmanaged Ethernet switch with 7 10/100BaseT(X) ports, and 1 100BaseFX single-mode port with SC connector for 80 km transmission, -40 to 75°C operating temperature
EDS-308-SS-SC-80-T	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors for 80 km transmission, -40 to 75°C operating temperature

EDS-309	Page 3-59
EDS-309-3M-SC	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 3 100BaseFX multi-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-309-3M-ST	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 3 100BaseFX multi-mode ports with ST connectors, 0 to 60°C operating temperature
EDS-309-3M-SC-T	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 3 100BaseFX multi-mode ports with SC connectors, -40 to 75°C operating temperature
EDS-309-3M-ST-T	Unmanaged Ethernet switch with 6 10/100BaseT(X) ports, and 3 100BaseFX multi-mode ports with ST connectors, -40 to 75°C operating temperature

EDS-316	Page 3-59
EDS-316	Unmanaged Ethernet switch with 16 10/100BaseT(X) ports, 0 to 60°C operating temperature
EDS-316-M-SC	Unmanaged Ethernet switch with 15 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port with SC connector, 0 to 60°C operating temperature
EDS-316-M-ST	Unmanaged Ethernet switch with 15 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port with ST connector, 0 to 60°C operating temperature
EDS-316-MM-SC	Unmanaged Ethernet switch with 14 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-316-MM-ST	Unmanaged Ethernet switch with 14 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with ST connectors, 0 to 60°C operating temperature
EDS-316-MS-SC	Unmanaged Ethernet switch with 14 10/100BaseT(X) ports, 1 100BaseFX multi-mode port with SC connector, and 1 100BaseFX single-mode port with SC connector, 0 to 60°C operating temperature
EDS-316-S-SC	Unmanaged Ethernet switch with 15 10/100BaseT(X) ports, and 1 100BaseFX single-mode port with SC connector, 0 to 60°C operating temperature
EDS-316-SS-SC	Unmanaged Ethernet switch with 14 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-316-MS-SC-80	Unmanaged Ethernet switch with 14 10/100BaseT(X) ports, 1 100BaseFX multi-mode port with SC connector, and 1 100BaseFX single-mode port with SC connector for 80 km transmission, 0 to 60°C operating temperature
EDS-316-S-SC-80	Unmanaged Ethernet switch with 15 10/100BaseT(X) ports, and 1 100BaseFX single-mode port with SC connector for 80 km transmission, 0 to 60°C operating temperature
EDS-316-SS-SC-80	Unmanaged Ethernet switch with 14 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors for 80 km transmission, 0 to 60°C operating temperature
EDS-316-SS-SC-40/80	Unmanaged Ethernet switch with 14 10/100BaseT(X) ports, 1 100BaseFX single-mode port with SC connector for 40 km transmission, and 1 100BaseFX single-mode port with SC connector for 80 km transmission, 0 to 60°C operating temperature
EDS-316-T	Unmanaged Ethernet switch with 16 10/100BaseT(X) ports, -40 to 75°C operating temperature
EDS-316-M-SC-T	Unmanaged Ethernet switch with 15 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port with SC connector, -40 to 75°C operating temperature
EDS-316-M-ST-T	Unmanaged Ethernet switch with 15 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port with ST connector, -40 to 75°C operating temperature
EDS-316-MM-SC-T	Unmanaged Ethernet switch with 14 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with SC connectors, -40 to 75°C operating temperature
EDS-316-MM-ST-T	Unmanaged Ethernet switch with 14 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with ST connectors, -40 to 75°C operating temperature
EDS-316-MS-SC-T	Unmanaged Ethernet switch with 14 10/100BaseT(X) ports, 1 100BaseFX multi-mode port with SC connector, and 1 100BaseFX single-mode port with SC connector, -40 to 75°C operating temperature
EDS-316-S-SC-T	Unmanaged Ethernet switch with 15 10/100BaseT(X) ports, and 1 100BaseFX single-mode port with SC connector, -40 to 75°C operating temperature
EDS-316-SS-SC-T	Unmanaged Ethernet switch with 14 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors, -40 to 75°C operating temperature

EDS-405A	Page 3-38
EDS-405A	Entry-level managed Ethernet switch with 5 10/100BaseT(X) ports, 0 to 60°C operating temperature
EDS-405A-MM-SC	Entry-level managed Ethernet switch with 3 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-405A-MM-ST	Entry-level managed Ethernet switch with 3 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with ST connectors, 0 to 60°C operating temperature
EDS-405A-SS-SC	Entry-level managed Ethernet switch with 3 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-405A-T	Entry-level managed Ethernet switch with 5 10/100BaseT(X) ports, -40 to 75°C operating temperature
EDS-405A-MM-SC-T	Entry-level managed Ethernet switch with 3 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with SC connectors, -40 to 75°C operating temperature
EDS-405A-MM-ST-T	Entry-level managed Ethernet switch with 3 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with ST connectors, -40 to 75°C operating temperature
EDS-405A-SS-SC-T	Entry-level managed Ethernet switch with 3 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors, -40 to 75°C operating temperature

EDS-408A	Page 3-38
EDS-408A	Entry-level managed Ethernet switch with 8 10/100BaseT(X) ports, 0 to 60°C operating temperature
EDS-408A-MM-SC	Entry-level managed Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-408A-MM-ST	Entry-level managed Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with ST connectors, 0 to 60°C operating temperature
EDS-408A-SS-SC	Entry-level managed Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-408A-3M-SC	Entry-level managed Ethernet switch with 5 10/100BaseT(X) ports, and 3 100BaseFX multi-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-408A-3M-ST	Entry-level managed Ethernet switch with 5 10/100BaseT(X) ports, and 3 100BaseFX multi-mode ports with ST connectors, 0 to 60°C operating temperature
EDS-408A-3S-SC	Entry-level managed Ethernet switch with 5 10/100BaseT(X) ports, and 3 100BaseFX single-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-408A-2M1S-SC	Entry-level managed Ethernet switch with 5 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports, 1 100BaseFX single-mode port with SC connectors, 0 to 60°C operating temperature
EDS-408A-1M2S-SC	Entry-level managed Ethernet switch with 5 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port, 2 100BaseFX single-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-408A-T	Entry-level managed Ethernet switch with 8 10/100BaseT(X) ports, -40 to 75°C operating temperature
EDS-408A-MM-SC-T	Entry-level managed Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with SC connectors, -40 to 75°C operating temperature
EDS-408A-MM-ST-T	Entry-level managed Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with ST connectors, -40 to 75°C operating temperature
EDS-408A-SS-SC-T	Entry-level managed Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors, -40 to 75°C operating temperature
EDS-408A-3M-SC-T	Entry-level managed Ethernet switch with 5 10/100BaseT(X) ports, and 3 100BaseFX multi-mode ports with SC connectors, -40 to 75°C operating temperature
EDS-408A-3M-ST-T	Entry-level managed Ethernet switch with 5 10/100BaseT(X) ports, and 3 100BaseFX multi-mode ports with ST connectors, -40 to 75°C operating temperature
EDS-408A-3S-SC-T	Entry-level managed Ethernet switch with 5 10/100BaseT(X) ports, and 3 100BaseFX single-mode ports with SC connectors, -40 to 75°C operating temperature
EDS-408A-2M1S-SC-T	Entry-level managed Ethernet switch with 5 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports, 1 100BaseFX single-mode port with SC connectors, -40 to 75°C operating temperature
EDS-408A-1M2S-SC-T	Entry-level managed Ethernet switch with 5 10/100BaseT(X) ports, and 1 100BaseFX multi-mode port, 2 100BaseFX single-mode ports with SC connectors, -40 to 75°C operating temperature

EDS-505A	Page 3-35
EDS-505A	Managed Ethernet switch with 5 10/100BaseT(X) ports, 0 to 60°C operating temperature
EDS-505A-MM-SC	Managed Ethernet switch with 3 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-505A-MM-ST	Managed Ethernet switch with 3 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with ST connectors, 0 to 60°C operating temperature
EDS-505A-SS-SC	Managed Ethernet switch with 3 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-505A-SS-SC-80	Managed Ethernet switch with 3 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors for 80 km transmission, 0 to 60°C operating temperature
EDS-505A-T	Managed Ethernet switch with 5 10/100BaseT(X) ports, -40 to 75°C operating temperature
EDS-505A-MM-SC-T	Managed Ethernet switch with 3 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with SC connectors, -40 to 75°C operating temperature
EDS-505A-MM-ST-T	Managed Ethernet switch with 3 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with ST connectors, -40 to 75°C operating temperature
EDS-505A-SS-SC-T	Managed Ethernet switch with 3 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors, -40 to 75°C operating temperature

EDS-508A	Page 3-35
EDS-508A	Managed Ethernet switch with 8 10/100BaseT(X) ports, 0 to 60°C operating temperature
EDS-508A-MM-SC	Managed Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-508A-MM-ST	Managed Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with ST connectors, 0 to 60°C operating temperature
EDS-508A-SS-SC	Managed Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-508A-SS-SC-80	Managed Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors for 80 km transmission, 0 to 60°C operating temperature
EDS-508A-T	Managed Ethernet switch with 8 10/100BaseT(X) ports, -40 to 75°C operating temperature
EDS-508A-MM-SC-T	Managed Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with SC connectors, -40 to 75°C operating temperature
EDS-508A-MM-ST-T	Managed Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with ST connectors, -40 to 75°C operating temperature
EDS-508A-SS-SC-T	Managed Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors, -40 to 75°C operating temperature
EDS-508A-SS-SC-80-T	Managed Ethernet switch with 6 10/100BaseT(X) ports, and 2 100BaseFX single-mode ports with SC connectors for 80 km transmission, -40 to 75°C operating temperature

EDS-510A	Page 3-33
EDS-510A-3GT	Managed Gigabit Ethernet switch with 7 10/100BaseT(X) ports, and 3 10/100/1000BaseT(X) ports, 0 to 60°C operating temperature
EDS-510A-1GT2SFP	Managed Gigabit Ethernet switch with 7 10/100BaseT(X) ports, 1 10/100/1000BaseT(X) port, and 2 SFP slots for adding SFP-1G series Gigabit Ethernet modules, 0 to 60°C operating temperature
EDS-510A-3SFP	Managed Gigabit Ethernet switch with 7 10/100BaseT(X) ports, and 3 SFP slots for adding SFP-1G series Gigabit Ethernet modules, 0 to 60°C operating temperature
EDS-510A-3GT-T	Managed Gigabit Ethernet switch with 7 10/100BaseT(X) ports, and 3 10/100/1000BaseT(X) ports, -40 to 75°C operating temperature
EDS-510A-1GT2SFP-T	Managed Gigabit Ethernet switch with 7 10/100BaseT(X) ports, 1 10/100/1000BaseT(X) port, and 2 SFP slots for adding SFP-1G series Gigabit Ethernet modules, -40 to 75°C operating temperature
EDS-510A-3SFP-T	Managed Gigabit Ethernet switch with 7 10/100BaseT(X) ports, and 3 SFP slots for adding SFP-1G series Gigabit Ethernet modules, -40 to 75°C operating temperature

NOTE: See the SFP-1G series ordering information for available SFP Gigabit Ethernet modules.

EDS-516A	Page 3-35
EDS-516A	Managed Ethernet switch with 16 10/100BaseT(X) ports, 0 to 60°C operating temperature
EDS-516A-MM-SC	Managed Ethernet switch with 14 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-516A-MM-ST	Managed Ethernet switch with 14 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with ST connectors, 0 to 60°C operating temperature
EDS-516A-T	Managed Ethernet switch with 16 10/100BaseT(X) ports, -40 to 75°C operating temperature
EDS-516A-MM-SC-T	Managed Ethernet switch with 14 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with SC connectors, -40 to 75°C operating temperature
EDS-516A-MM-ST-T	Managed Ethernet switch with 14 10/100BaseT(X) ports, and 2 100BaseFX multi-mode ports with ST connectors, -40 to 75°C operating temperature

EDS-518A	Page 3-31
EDS-518A	Managed Gigabit Ethernet switch with 16 10/100BaseT(X) ports, and 2 combo 10/100/1000BaseT(X) or 1000BaseSFP slots for adding SFP-1G series Gigabit Ethernet modules, 0 to 60°C operating temperature
EDS-518A-MM-SC	Managed Gigabit Ethernet switch with 14 10/100BaseT(X) ports, 2 100BaseFX multi-mode ports with SC connectors, and 2 combo 10/100/1000BaseT(X) or 1000BaseSFP slots for adding SFP-1G series Gigabit Ethernet modules, 0 to 60°C operating temperature
EDS-518A-MM-ST	Managed Gigabit Ethernet switch with 14 10/100BaseT(X) ports, 2 100BaseFX multi-mode ports with ST connectors, and 2 combo 10/100/1000BaseT(X) or 1000BaseSFP slots for adding SFP-1G series Gigabit Ethernet modules, 0 to 60°C operating temperature
EDS-518A-SS-SC	Managed Gigabit Ethernet switch with 14 10/100BaseT(X) ports, 2 100BaseFX single-mode ports with SC connectors, and 2 combo 10/100/1000BaseT(X) or 1000BaseSFP slots for adding SFP-1G series Gigabit Ethernet modules, 0 to 60°C operating temperature
EDS-518A-SS-SC-80	Managed Gigabit Ethernet switch with 14 10/100BaseT(X) ports, 2 100BaseFX single-mode ports with SC connectors for 80 km transmission, and 2 combo 10/100/1000BaseT(X) or 1000BaseSFP slots for adding SFP-1G series Gigabit Ethernet modules, 0 to 60°C operating temperature
EDS-518A-T	Managed Gigabit Ethernet switch with 16 10/100BaseT(X) ports, and 2 combo 10/100/1000BaseT(X) or 1000BaseSFP slots for adding SFP-1G series Gigabit Ethernet modules, -40 to 75°C operating temperature
EDS-518A-MM-SC-T	Managed Gigabit Ethernet switch with 14 10/100BaseT(X) ports, 2 100BaseFX multi-mode ports with SC connectors, and 2 combo 10/100/1000BaseT(X) or 1000BaseSFP slots for adding SFP-1G series Gigabit Ethernet modules, -40 to 75°C operating temperature
EDS-518A-MM-ST-T	Managed Gigabit Ethernet switch with 14 10/100BaseT(X) ports, 2 100BaseFX multi-mode ports with ST connectors, and 2 combo 10/100/1000BaseT(X) or 1000BaseSFP slots for adding SFP-1G series Gigabit Ethernet modules, -40 to 75°C operating temperature
EDS-518A-SS-SC-T	Managed Gigabit Ethernet switch with 14 10/100BaseT(X) ports, 2 100BaseFX single-mode ports with SC connectors, and 2 combo 10/100/1000BaseT(X) or 1000BaseSFP slots for adding SFP-1G series Gigabit Ethernet modules, -40 to 75°C operating temperature
	NOTE: See the SFP-1G series ordering information for available SFP Gigabit Ethernet modules.

EDS-608	Page 3-24
EDS-608	Compact managed Ethernet switch system with 2 slots for 4-port fast Ethernet interface modules, for a total of up to 8 ports, 0 to 60°C operating temperature
EDS-608-T	Compact managed Ethernet switch system with 2 slots for 4-port fast Ethernet interface modules, for a total of up to 8 ports, -40 to 75°C operating temperature
	NOTE: See the CM-600 series ordering information for available fast Ethernet modules.

EDS-728	Page 3-22
EDS-72810G	Modular managed Ethernet switch system with 6 slots for 4-port fast Ethernet interface modules and 2 slots for 2-port Gigabit interface modules, for a total of up to 24+4G ports, 0 to 60°C operating temperature
	NOTE: See the IM series ordering information for available Gigabit and fast Ethernet modules.

EDS-828	Page 3-20
EDS-82810G	Layer 3 managed Ethernet switch system with 6 slots for 4-port fast Ethernet interface modules and 2 slots for 2-port Gigabit interface modules, for a total of up to 24+4G ports, 0 to 60°C operating temperature
	NOTE: See the IM series ordering information for available Gigabit and fast Ethernet modules.

EDS-G205	Page 3-57
EDS-G205	Unmanaged full Gigabit Ethernet switch with 5 10/100/1000BaseT(X) ports, 0 to 60°C operating temperature
EDS-G205-T	Unmanaged full Gigabit Ethernet switch with 5 10/100/1000BaseT(X) ports, -40 to 75°C operating temperature

EDS-G308	Page 3-57
EDS-G308	Unmanaged full Gigabit Ethernet switch with 8 10/100/1000BaseT(X) ports, 0 to 60°C operating temperature
EDS-G308-2SFP	Unmanaged full Gigabit Ethernet switch with 6 10/100/1000BaseT(X) ports, and 2 combo 10/100/1000BaseT(X) or 100/1000BaseSFP slots for adding SFP-1G/1FE series Gigabit/fast Ethernet modules, 0 to 60°C operating temperature
EDS-G308-T	Unmanaged full Gigabit Ethernet switch with 8 10/100/1000BaseT(X) ports, -40 to 75°C operating temperature
EDS-G308-2SFP-T	Unmanaged full Gigabit Ethernet switch with 6 10/100/1000BaseT(X) ports, and 2 combo 10/100/1000BaseT(X) or 100/1000BaseSFP slots for adding SFP-1G/1FE series Gigabit/fast Ethernet modules, -40 to 75°C operating temperature
	NOTE: See the SFP-1G/1FE Series ordering information for available SFP Gigabit/Fast Ethernet modules.

EDS-G509	Page 3-29
EDS-G509	Managed full Gigabit Ethernet switch with 4 10/100/1000BaseT(X) ports, and 5 combo 10/100/1000BaseT(X) or 100/1000BaseSFP slots for adding SFP-1G/1FE series Gigabit/fast Ethernet modules, 0 to 60°C operating temperature
EDS-G509-T	Managed full Gigabit Ethernet switch with 4 10/100/1000BaseT(X) ports, and 5 combo 10/100/1000BaseT(X) or 100/1000BaseSFP slots for adding SFP-1G/1FE series Gigabit/fast Ethernet modules, -40 to 75°C operating temperature
	NOTE: See the SFP-1G/1FE series ordering information for available SFP Gigabit/Fast Ethernet modules.

EDS-P308	Page 3-66
EDS-P308	Unmanaged Ethernet switch with 4 10/100BaseT(X) ports, and 4 PoE ports, 0 to 60°C operating temperature
EDS-P308-M-SC	Unmanaged Ethernet switch with 3 10/100BaseT(X) ports, 4 PoE ports, and 1 100BaseFX multi-mode port with SC connector, 0 to 60°C operating temperature
EDS-P308-S-SC	Unmanaged Ethernet switch with 3 10/100BaseT(X) ports, 4 PoE ports, and 1 100BaseFX single-mode port with SC connector, 0 to 60°C operating temperature
EDS-P308-MM-SC	Unmanaged Ethernet switch with 2 10/100BaseT(X) ports, 4 PoE ports, and 2 100BaseFX multi-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-P308-SS-SC	Unmanaged Ethernet switch with 2 10/100BaseT(X) ports, 4 PoE ports, and 2 100BaseFX single-mode ports with SC connectors, 0 to 60°C operating temperature
EDS-P308-T	Unmanaged Ethernet switch with 4 10/100BaseT(X) ports, and 4 PoE ports, -40 to 75°C operating temperature
EDS-P308-M-SC-T	Unmanaged Ethernet switch with 3 10/100BaseT(X) ports, 4 PoE ports, and 1 100BaseFX multi-mode port with SC connector, -40 to 75°C operating temperature
EDS-P308-S-SC-T	Unmanaged Ethernet switch with 3 10/100BaseT(X) ports, 4 PoE ports, and 1 100BaseFX single-mode port with SC connector, -40 to 75°C operating temperature
EDS-P308-MM-SC-T	Unmanaged Ethernet switch with 2 10/100BaseT(X) ports, 4 PoE ports, and 2 100BaseFX multi-mode ports with SC connectors, -40 to 75°C operating temperature
EDS-P308-SS-SC-T	Unmanaged Ethernet switch with 2 10/100BaseT(X) ports, 4 PoE ports, and 2 100BaseFX single-mode ports with SC connectors, -40 to 75°C operating temperature

EDS-P510	Page 3-40
EDS-P510	Managed Gigabit Ethernet switch with 3 10/100BaseT(X) ports, 4 PoE 10/100BaseT(X) ports, and 3 combo 10/100/1000BaseT(X) or 100/1000BaseSFP slots for adding SFP-1G/1FE series Gigabit/fast Ethernet modules, 0 to 60°C operating temperature
EDS-P510-T	Managed Gigabit Ethernet switch with 3 10/100BaseT(X) ports, 4 PoE 10/100BaseT(X) ports, and 3 combo 10/100/1000BaseT(X) or 100/1000BaseSFP slots for adding SFP-1G/1FE series Gigabit/fast Ethernet modules, -40 to 75°C operating temperature
	NOTE: See the SFP-1G/1FE Series ordering information for available SFP Gigabit/Fast Ethernet modules.

EDS-SNMP OPC Server Pro	Page 3-51
EDS-SNMP OPC Server Pro	OPC server software that works with all SNMP devices

EM-1220	Page 15-66
EM-1220-LX	RISC-based embedded core module with 2 serial ports, dual LANs, SD, µClinux, -10 to 60°C operating temperature
EM-1220-T-LX	RISC-based embedded core module with 2 serial ports, dual LANs, SD, µClinux, -40 to 75°C operating temperature
EM-1220 Development Kit	Includes the EM-1220-DK snap-on testing board with built-in RJ45 LAN ports and DB9 male serial ports

EM-1240	Page 15-63
EM-1240-LX	RISC-based embedded core module with 4 serial ports, dual LANs, SD, µClinux OS, -10 to 60°C operating temperature
EM-1240-T-LX	RISC-based embedded core module with 4 serial ports, dual LANs, SD, µClinux, -40 to 75°C operating temperature
EM-1240 Development Kit	Includes the EM-1240-DK snap-on testing board with built-in RJ45 LAN ports and DB9 male serial ports

EM-2260	Page 15-60
EM-2260-CE	RISC-based embedded core module with 4 serial ports, 8 DI and 8 DO channels, dual LANs, VGA, CompactFlash, USB, WinCE 6.0 OS
EM-2260-LX	RISC-based embedded core module with 4 serial ports, 8 DI and 8 DO channels, dual LANs, VGA, CompactFlash, USB, Linux OS
EM-2260-CE Development Kit	Includes the EM-2260-CE module and EM-2260-DK carrier board for testing and application development
EM-2260-LX Development Kit	Includes the EM-2260-CE module and EM-2260-DK carrier board for testing and application development

EOM-104	Page 3-43
EOM-104	4-port embedded managed Ethernet switch module, -40 to 75°C operating temperature

IA240/241	Page 16-9
IA240-LX	RISC-based industrial computer with 4 serial ports, 4 DI and 4 DO channels, dual LANs, SD, Linux OS, -10 to 60°C operating temperature
IA241-LX	RISC-based industrial computer with 4 serial ports, 4 DI and 4 DO channels, dual LANs, PCMCIA, SD, Linux OS, -10 to 60°C operating temperature
IA240-T-LX	RISC-based industrial computer with 4 serial ports, 4 DI and 4 DO channels, dual LANs, SD, Linux OS, -40 to 75°C operating temperature
IA241-T-LX	RISC-based industrial computer with 4 serial ports, 4 DI and 4 DO channels, dual LANs, PCMCIA, SD, Linux OS, -40 to 75°C operating temperature

IA260	Page 16-3
IA260-CE	RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, CompactFlash, USB, Win CE 6.0 OS, -10 to 60°C operating temperature
IA260-LX	RISC-based industrial embedded computer with 4 serial ports, 8 DI, 8 DO, dual LANs, VGA, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature
IA260-T-CE	RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, CompactFlash, USB, Win CE 6.0 OS, -40 to 75°C operating temperature
IA260-T-LX	RISC-based industrial embedded computer with 4 serial ports, 8 DI, 8 DO, dual LANs, VGA, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

IA261-I/262-I	Page 16-6
IA261-I-LX	RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature
IA261-I-CE	RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, CompactFlash, USB, Win CE 6.0 OS, -10 to 60°C operating temperature
IA262-I-LX	RISC-based embedded computer with 2 serial ports, DIO, dual LANs, VGA, CANbus, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature
IA262-I-CE	RISC-based embedded computer with 2 serial ports, DIO, dual LANs, VGA, CANbus, CompactFlash, USB, Win CE 6.0 OS, -10 to 60°C operating temperature
IA261-I-T-LX	RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature
IA261-I-T-CE	RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, CompactFlash, USB, Win CE 6.0 OS, -40 to 75°C operating temperature
IA262-I-T-LX	RISC-based embedded computer with 2 serial ports, DIO, dual LANs, VGA, CANbus, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature
IA262-I-T-CE	RISC-based embedded computer with 2 serial ports, DIO, dual LANs, VGA, CANbus, CompactFlash, USB, Win CE 6.0 OS, -40 to 75°C operating temperature

ICF-1150	Page 12-11
ICF-1150	Industrial RS-232/422/485 to multimode fiber converter, SC connector, 0 to 60°C operating temperature
ICF-1150-M-ST	Industrial RS-232/422/485 to multimode fiber converter, ST connector, 0 to 60°C operating temperature
ICF-1150-S-SC	Industrial RS-232/422/485 to single mode fiber converter, SC connector, 0 to 60°C operating temperature
ICF-1150-S-ST	Industrial RS-232/422/485 to single mode fiber converter, ST connector, 0 to 60°C operating temperature
ICF-1150I-M-SC	Industrial RS-232/422/485 to multimode fiber converter, SC connector, 2 KV isolation, 0 to 60°C operating temperature
ICF-1150I-M-ST	Industrial RS-232/422/485 to multimode fiber converter, ST connector, 2 KV isolation, 0 to 60°C operating temperature
ICF-1150I-S-SC	Industrial RS-232/422/485 to single mode fiber converter, SC connector, 2 KV isolation, 0 to 60°C operating temperature
ICF-1150I-S-ST	Industrial RS-232/422/485 to single mode fiber converter, ST connector, 2 KV isolation, 0 to 60°C operating temperature
ICF-1150-M-SC-T	Industrial RS-232/422/485 to multimode fiber converter, SC connector, -40 to 85°C operating temperature
ICF-1150-M-ST-T	Industrial RS-232/422/485 to multimode fiber converter, ST connector, -40 to 85°C operating temperature
ICF-1150-S-SC-T	Industrial RS-232/422/485 to single mode fiber converter, SC connector, -40 to 85°C operating temperature
ICF-1150-S-ST-T	Industrial RS-232/422/485 to single mode fiber converter, ST connector, -40 to 85°C operating temperature
ICF-1150I-M-SC-T	Industrial RS-232/422/485 to multimode fiber converter, SC connector, 2 KV isolation, -40 to 85°C operating temperature
ICF-1150I-M-ST-T	Industrial RS-232/422/485 to multimode fiber converter, ST connector, 2 KV isolation, -40 to 85°C operating temperature
ICF-1150I-S-SC-T	Industrial RS-232/422/485 to single mode fiber converter, SC connector, 2 KV isolation, -40 to 85°C operating temperature
ICF-1150I-S-ST-T	Industrial RS-232/422/485 to single mode fiber converter, ST connector, 2 KV isolation, -40 to 85°C operating temperature

IKS-6324	Page 3-55
IKS-6324-F-LV-T	Unmanaged rackmount Ethernet switch system with 22 10/100BaseT(X) ports, and 1 slot for fast Ethernet or Gigabit Ethernet modules, for a total of up to 22+2G ports, cabling on front panel, 1 power supply (24/48 VDC), -40 to 75°C operating temperature
IKS-6324-F-HV-T	Unmanaged rackmount Ethernet switch system with 22 10/100BaseT(X) ports, and 1 slot for fast Ethernet or Gigabit Ethernet modules, for a total of up to 22+2G ports, cabling on front panel, 1 power supply (88 to 300 VDC and 85 to 264 VAC), -40 to 75°C operating temperature

NOTE: See the PM-7200 series ordering information for available Gigabit and fast Ethernet modules.

IKS-6726	Page 3-14
IKS-6726-F-24-T	Modular managed rackmount Ethernet switch system with 8 10/100BaseT(X) ports, 2 slots for fast Ethernet modules, and 1 slot for a Gigabit Ethernet module, for a total of up to 24+2G ports, cabling on front panel, 1 isolated power supply (24 VDC), -40 to 75°C operating temperature
IKS-6726-F-24-24-T	Modular managed rackmount Ethernet switch system with 8 10/100BaseT(X) ports, 2 slots for fast Ethernet modules, and 1 slot for a Gigabit Ethernet module, for a total of up to 24+2G ports, cabling on front panel, 2 isolated power supply (24 VDC), -40 to 75°C operating temperature
IKS-6726-F-24-48-T	Modular managed rackmount Ethernet switch system with 8 10/100BaseT(X) ports, 2 slots for fast Ethernet modules, and 1 slot for a Gigabit Ethernet module, for a total of up to 24+2G ports, cabling on front panel, 2 isolated power supply (24 and 48 VDC), -40 to 75°C operating temperature
IKS-6726-F-24-HV-T	Modular managed rackmount Ethernet switch system with 8 10/100BaseT(X) ports, 2 slots for fast Ethernet modules, and 1 slot for a Gigabit Ethernet module, for a total of up to 24+2G ports, cabling on front panel, 2 isolated power supply (24 and 88-300 VDC or 85-264 VAC), -40 to 75°C operating temperature
IKS-6726-F-48-T	Modular managed rackmount Ethernet switch system with 8 10/100BaseT(X) ports, 2 slots for fast Ethernet modules, and 1 slot for a Gigabit Ethernet module, for a total of up to 24+2G ports, cabling on front panel, 1 isolated power supply (48 VDC), -40 to 75°C operating temperature
IKS-6726-F-48-48-T	Modular managed rackmount Ethernet switch system with 8 10/100BaseT(X) ports, 2 slots for fast Ethernet modules, and 1 slot for a Gigabit Ethernet module, for a total of up to 24+2G ports, cabling on front panel, 2 isolated power supply (48 VDC), -40 to 75°C operating temperature
IKS-6726-F-48-HV-T	Modular managed rackmount Ethernet switch system with 8 10/100BaseT(X) ports, 2 slots for fast Ethernet modules, and 1 slot for a Gigabit Ethernet module, for a total of up to 24+2G ports, cabling on front panel, 2 isolated power supply (48 and 88-300 VDC or 85-264 VAC), -40 to 75°C operating temperature
IKS-6726-F-HV-T	Modular managed rackmount Ethernet switch system with 8 10/100BaseT(X) ports, 2 slots for fast Ethernet modules, and 1 slot for a Gigabit Ethernet module, for a total of up to 24+2G ports, cabling on front panel, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 75°C operating temperature
IKS-6726-F-HV-HV-T	Modular managed rackmount Ethernet switch system with 8 10/100BaseT(X) ports, 2 slots for fast Ethernet modules, and 1 slot for a Gigabit Ethernet module, for a total of up to 24+2G ports, cabling on front panel, 2 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 75°C operating temperature

NOTE: See the PM-7200 series ordering information for available Gigabit and fast Ethernet modules.

IKS-6726-PoE	Page 3-17
IKS-6726-PoE-F-48-T	Modular managed rackmount Ethernet switch system with 8 10/100BaseT(X) ports, 2 slots for fast Ethernet modules (PoE), and 1 slot for a Gigabit Ethernet module, for a total of up to 24+2G ports, cabling on front panel, 1 isolated power supply (48 VDC), -40 to 75°C operating temperature
IKS-6726-PoE-F-48-48-T	Modular managed rackmount Ethernet switch system with 8 10/100BaseT(X) ports, 2 slots for fast Ethernet modules (PoE), and 1 slot for a Gigabit Ethernet module, for a total of up to 24+2G ports, cabling on front panel, 2 isolated power supply (48 VDC), -40 to 75°C operating temperature
IKS-6726-PoE-F-48-HV-T	Modular managed rackmount Ethernet switch system with 8 10/100BaseT(X) ports, 2 slots for fast Ethernet modules (PoE), and 1 slot for a Gigabit Ethernet module, for a total of up to 24+2G ports, cabling on front panel, 2 isolated power supply (48 VDC and 88-300 VDC or 85-264 VAC), -40 to 75°C operating temperature
IKS-6726-PoE-F-HV-T	Modular managed rackmount Ethernet switch system with 8 10/100BaseT(X) ports, 2 slots for fast Ethernet modules (PoE), and 1 slot for a Gigabit Ethernet module, for a total of up to 24+2G ports, cabling on front panel, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 75°C operating temperature
IKS-6726-PoE-F-HV-HV-T	Modular managed rackmount Ethernet switch system with 8 10/100BaseT(X) ports, 2 slots for fast Ethernet modules (PoE), and 1 slot for a Gigabit Ethernet module, for a total of up to 24+2G ports, cabling on front panel, 2 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 75°C operating temperature

NOTE: See the PM-7200 series ordering information for available Gigabit and fast Ethernet modules.

IM Series Interface Modules	Page 3-26
IM-2GTX	Gigabit Ethernet interface module with 2 10/100/1000BaseT(X) ports, 0 to 60°C operating temperature
IM-2GSFP	Gigabit Ethernet interface module with 2 1000BaseSFP slots (see the SFP-1G series ordering information for available Gigabit Ethernet SFP modules), 0 to 60°C operating temperature
IM-4TX	Fast Ethernet interface module with 4 10/100BaseT(X) ports, 0 to 60°C operating temperature
IM-4MSC	Fast Ethernet interface module with 4 100BaseFX multi-mode ports (SC connectors), 0 to 60°C operating temperature
IM-4MST	Fast Ethernet interface module with 4 100BaseFX multi-mode ports (ST connectors), 0 to 60°C operating temperature
IM-2MSC/2TX	Fast Ethernet interface module with 2 10/100BaseT(X) ports and 2 100BaseFX multi-mode ports (SC connectors), 0 to 60°C operating temperature
IM-2MST/2TX	Fast Ethernet interface module with 2 10/100BaseT(X) ports and 2 100BaseFX multi-mode ports (ST connectors), 0 to 60°C operating temperature
IM-4SSC	Fast Ethernet interface module with 4 100BaseFX single-mode ports (SC connectors), 0 to 60°C operating temperature
IM-2SSC/2TX	Fast Ethernet interface module with 2 10/100BaseT(X) ports and 2 100BaseFX single-mode ports (SC connectors), 0 to 60°C operating temperature
IM-1LSC/3TX	Fast Ethernet interface module with 3 10/100BaseT(X) ports and 1 100BaseFX single-mode port (SC connector for 80 km transmission), 0 to 60°C operating temperature

IMC-21	Page 12-30
IMC-21-M-SC	Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, SC connector
IMC-21-M-ST	Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, ST connector
IMC-21-S-SC	Industrial 10/100BaseT(X) to 100BaseFX media converter, single mode, SC connector

IMC-101	Page 12-28
IMC-101-M-SC	Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, SC connector, 0 to 60°C operating temperature
IMC-101-M-ST	Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, ST connector, 0 to 60°C operating temperature
IMC-101-S-SC	Industrial 10/100BaseT(X) to 100BaseFX media converter, single mode, SC connector, 40 km, 0 to 60°C operating temperature
IMC-101-S-SC-80	Industrial 10/100BaseT(X) to 100BaseFX media converter, single mode, SC connector, 80 km, 0 to 60°C operating temperature
IMC-101-M-SC-T	Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, SC connector, -40 to 75°C operating temperature
IMC-101-M-ST-T	Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, ST connector, -40 to 75°C operating temperature
IMC-101-S-SC-T	Industrial 10/100BaseT(X) to 100BaseFX media converter, single mode, SC connector, 40 km, -40 to 75°C operating temperature
IMC-101-S-SC-80-T	Industrial 10/100BaseT(X) to 100BaseFX media converter, single mode, SC connector, 80 km, -40 to 75°C operating temperature

IMC-101G	Page 12-26
IMC-101G	Industrial 10/100/1000BaseT(X) to 1000BaseSX/LX/LHX/ZX media converter, 0 to 60°C operating temperature
IMC-101G-T	Industrial 10/100/1000BaseT(X) to 1000BaseSX/LX/LHX/ZX media converter, -40 to 75°C operating temperature

ioLogik E22xx	Page 5-15
ioLogik E2210	Active Ethernet I/O with 12 digital inputs and 8 digital outputs (Page 5-15)
ioLogik E2212	Active Ethernet I/O with 8 digital inputs, 8 digital outputs, and 4 configurable DIOs (Page 5-16)
ioLogik E2214	Active Ethernet I/O with 6 digital inputs and 6 relay outputs (Page 5-17)
ioLogik E2240	Active Ethernet I/O with 8 analog inputs and 2 analog outputs (Page 5-18)
ioLogik E2242	Active Ethernet I/O with 4 analog inputs and 12 configurable DIOs (Page 5-19)
ioLogik E2260	Active Ethernet I/O with 6 RTD inputs and 4 digital outputs (Page 5-20)
ioLogik E2262	Active Ethernet I/O with 8 thermocouple inputs and 4 digital outputs (Page 5-21)

ioLogik E4200	Page 5-24
ioLogik E4200	Modular Active Ethernet I/O adaptor

ioLogik R2110/R2140	Page 5-29
ioLogik R2110	RS-485 remote I/O with 12 digital inputs and 8 digital outputs
ioLogik R2140	RS-485 remote I/O with 8 analog inputs and 2 analog outputs

ioLogik W5340	Page 5-27
ioLogik W5340	Active GPRS I/O with 4 AIs, 8 DIOs, and 2 relay outputs

ioMirror E3210	Page 5-22
ioMirror E3210	Ethernet Peer-to-Peer I/O with 8 digital inputs and 8 digital outputs

L

LDP1602 LCD Module	Page 5-26
LDP1602	Snap-on LCD module with 16 x 2 text display and 5 buttons (can be used with any of the E2000, R2000, and E3000 products)

M

M-1000 Series Digital Input Modules	Page 5-33
M-1800	8 digital inputs, sink, 24 VDC
M-1801	8 digital inputs, source, 24 VDC
M-1600	16 digital inputs, sink, 24 VDC
M-1601	16 digital inputs, source, 24 VDC
M-1450	4 digital inputs, 110 VAC
M-1451	4 digital inputs, 220 VAC

M-2000 Series Digital Output Modules	Page 5-35
M-2800	8 digital outputs, sink, 24 VDC, 0.5 A
M-2801	8 digital outputs, source, 24 VDC, 0.5 A
M-2600	16 digital outputs, sink, 24 VDC, 0.3 A
M-2601	16 digital outputs, source, 24 VDC, 0.3 A
M-2450	4 relay outputs, 24 VDC/230 VAC, 2 A

M-3000 Series Analog Input Modules	Page 5-37
M-3802	8 analog inputs, 4 to 20 mA, 12 bits
M-3810	8 analog inputs, 0 to 10 V, 12 bits

M-4000 Series Analog Output Modules	Page 5-39
M-4402	4 analog outputs, 4 to 20 mA, 12 bits
M-4410	4 analog outputs, 0 to 10 V, 12 bits

M-6000 Series Temperature Input Modules	Page 5-38
M-6200	2 analog inputs, RTD (PT100, JPT100)
M-6201	2 analog inputs, thermocouple

M-7000 Series Power Modules	Page 5-40
M-7001	System power expansion module, 10A/5 VDC
M-7002	Field power distributor module
M-7804	Potential distributor module, 8-ch, 0 VDC
M-7805	Potential distributor module, 8-ch, 24 VDC

MDR Series DIN-Rail Power Supplies	Page A-8
MDR-40-24	40W/1.7A DIN-Rail 24 VDC power supply with universal 85 to 264 VAC input, -20 to 70°C operating temperature
MDR-60-24	60W/2.5A DIN-Rail 24 VDC power supply with universal 85 to 264 VAC input, -20 to 70°C operating temperature
	Note: See DR Series DIN-Rail Power Supplies for related products.

MGate™ EIP3000	Page 9-13
MGate™ EIP3170	1-port DF1 to Ethernet/IP gateway, 0 to 55°C operating temperature
MGate™ EIP3170I	1-port DF1 to Ethernet/IP gateway with 2 KV isolation, 0 to 55°C operating temperature
MGate™ EIP3270	2-port DF1 to Ethernet/IP gateway, 0 to 55°C operating temperature
MGate™ EIP3270I	2-port DF1 to Ethernet/IP gateway with 2 KV isolation, 0 to 55°C operating temperature
MGate™ EIP3170-T	1-port DF1 to Ethernet/IP gateway, -40 to 75°C operating temperature
MGate™ EIP3170I-T	1-port DF1 to Ethernet/IP gateway with 2 KV isolation, -40 to 75°C operating temperature
MGate™ EIP3270-T	2-port DF1 to Ethernet/IP gateway, -40 to 75°C operating temperature
MGate™ EIP3270I-T	2-port DF1 to Ethernet/IP gateway with 2 KV isolation, -40 to 75°C operating temperature

MGate™ MB3170/3270	Page 9-8
MGate™ MB3170	1-port advanced Modbus gateway, 0 to 55°C operating temperature
MGate™ MB3170I	1-port advanced Modbus gateway with 2 KV isolation, 0 to 55°C operating temperature
MGate™ MB3270	2-port advanced Modbus gateway, 0 to 55°C operating temperature
MGate™ MB3270I	2-port advanced Modbus gateway with 2 KV isolation, 0 to 55°C operating temperature
MGate™ MB3170-T	1-port advanced Modbus gateway, -40 to 75°C operating temperature
MGate™ MB3170I-T	1-port advanced Modbus gateway with 2 KV isolation, -40 to 75°C operating temperature
MGate™ MB3270-T	2-port advanced Modbus gateway, -40 to 75°C operating temperature
MGate™ MB3270I-T:	2-port advanced Modbus gateway with 2 KV isolation, -40 to 75°C operating temperature

MGate™ MB3180/3280/3480	Page 9-11
MGate™ MB3180	1-port standard Modbus gateway
MGate™ MB3280	2-port standard Modbus gateway
MGate™ MB3480	4-port standard Modbus gateway

MiiNePort E1	Page 8-42
MiiNePort E1	Embedded device server module for TTL devices supporting 10/100BaseT(x) with RJ45 connector, 0 to 55°C operating temperature
MiiNePort E1-T	Embedded device server module for TTL devices supporting 10/100BaseT(x) with RJ45 connector, -40 to 85°C operating temperature
MiiNePort E1-ST	Starter kit for the MiiNePort E1 Series

Modular I/O Accessories	Pages 5-42
TB 1600	DIN-rail mounting screw terminal module with 20-pin connector
Flat Cable	20-pin to 20-pin flat cable
M-8001-PK	Removable terminal block, 9 pcs per pack
M-8003-PK	Marker with 0 to 9 numbering, white color, 100 pcs per pack
M-8004-PK	Blank marker, 100 pcs per pack

MXview Lite	Page 3-49
MXview Lite	Browser-based network management software that supports monitoring 32 units of Moxa's managed Ethernet switches
	Note: Registered users of Moxa's managed Ethernet switches can download MXview Lite for free from from Moxa's website.

N

NA-4010	Page 5-25
NA-4010	Ethernet Network Adaptor (Modbus/TCP)

NA-4020/4021	Page 5-31
NA-4020	RS-485 Network Adaptor (Modbus)
NA-4021	RS-232 Network Adaptor (Modbus)

NE-4100	Page 8-45
NE-4110S	Device server module for RS-232 devices, supports 10/100BaseT(x) with RJ45 connector
NE-4110A	Device server module for RS-422/485 devices, supports 10/100BaseT(x) with RJ45 connector
NE-4120S	Device server module for RS-232 devices, supports 10/100BaseT(x) with 5-pin Ethernet pin header
NE-4120A	Device server module for RS-422/485 devices, supports 10/100BaseT(x) with 5-pin Ethernet pin header
NE-4100T	Device server module for TTL devices, supports 10/100BaseT(x) with DIL package
NE-4110-ST	Starter kit for the NE-4110S and NE-4110A
NE-4120-ST	Starter kit for the NE-4120S and NE-4120A
NE-4100-ST	Starter kit for the NE-4100T

NM-xxxx Series Network Expansion Modules for the NPort 6400/6600	Page 7-19
NM-TX01	Ethernet module with 1 10/100BaseTX port with RJ45 connector
NM-TX02	Ethernet module with 2 10/100BaseTX ports with RJ45 connectors
NM-FX01-S-SC	Ethernet module with 1 100BaseFX single-mode fiber Ethernet port with SC connector
NM-FX01-M-SC	Ethernet module with 1 100BaseFX multi-mode fiber Ethernet port with SC connector
NM-FX02-S-SC	Ethernet module with 2 100BaseFX single-mode fiber Ethernet ports with SC connectors
NM-FX02-M-SC	Ethernet module with 2 100BaseFX multi-mode fiber Ethernet ports with SC connectors
NM-GPRS/GSM	GPRS/GSM modem module
NM-Modem	V.92 modem module 1 PSTN modem port with RJ11 connector (Note: Detailed information about using the NM-Modem PSTN module can be found on page 7-22)

NPort® 5100	Page 8-20
NPort® 5110	1-port RS-232 device server, 0 to 55°C operating temperature
NPort® 5130	1-port RS-422/485 device server, 0 to 55°C operating temperature
NPort® 5150	1-port RS-232/422/485 device server, 0 to 55°C operating temperature
NPort® 5110-T	1-port RS-232 device server, -40 to 75°C operating temperature

NPort® 5200	Page 8-25
NPort® 5210	2-port RS-232 device server, 0 to 55°C operating temperature
NPort® 5230	2-port device server with 1 RS-232 port and 1 RS-422/485 port, 0 to 55°C operating temperature
NPort® 5232	2-port RS-422/485 device server, 0 to 55°C operating temperature
NPort® 5232I	2-port RS-422/485 device server with 2 KV optical isolation, 0 to 55°C operating temperature
NPort® 5210-T	2-port RS-232 device server, -40 to 75°C operating temperature
NPort® 5230-T	2-port device server with 1 RS-232 port and 1 RS-422/485 port, -40 to 75°C operating temperature
NPort® 5232-T	2-port RS-422/485 device server, -40 to 75°C operating temperature
NPort® 5232I-T	2-port RS-422/485 device server with 2 KV optical isolation, -40 to 75°C operating temperature

NPort® 5400	Page 8-29
NPort® 5410	4-port RS-232 device server
NPort® 5430	4-port RS-422/485 device server
NPort® 5430I	4-port RS-422/485 device server with 2 KV optical isolation
NPort® 5450	4-port RS-232/422/485 device server
NPort® 5450I	4-port RS-232/422/485 device server with 2 KV optical isolation

NPort® 5600 Rackmount Series	Page 8-32
NPort® 5610-8	8-port RS-232 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5610-8-48V	8-port RS-232 rackmount device server with RJ45 connectors and ±48 VDC power input
NPort® 5630-8	8-port RS-422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5650-8	8-port RS-232/422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5650-8-M-SC	8-port RS-232/422/485 rackmount device server with RJ45 connectors and 100BaseF(X) multi-mode fiber (SC connector)
NPort® 5650-8-S-SC	8-port RS-232/422/485 rackmount device server with RJ45 connectors and 100BaseF(X) single-mode fiber (SC connector)
NPort® 5610-16	16-port RS-232 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5610-16-48V	16-port RS-232 rackmount device server with RJ45 connectors and ±48 VDC power input
NPort® 5630-16	16-port RS-422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5650-16	16-port RS-232/422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort® 5650-16-M-SC	16-port RS-232/422/485 rackmount device server with RJ45 connectors and 100BaseF(X) multi-mode fiber (SC connector)
NPort® 5650-16-S-SC	16-port RS-232/422/485 rackmount device server with RJ45 connectors and 100BaseF(X) single-mode fiber (SC connector)

NPort® 5600 Desktop Series	Page 8-35
NPort® 5610-8-DT	8-port RS-232 desktop device server with DB9 male connectors
NPort® 5610-8-DT-J	8-port RS-232 desktop device server with RJ45 connectors
NPort® 5650-8-DT	8-port RS-232/422/485 desktop device server with DB9 male connectors
NPort® 5650-8-DT-J	8-port RS-232/422/485 desktop device server with RJ45 connectors
NPort® 5650I-8-DT	8-port RS-232/422/485 desktop device server with DB9 male connectors and 2 KV optical isolation

NPort 6150	Page 7-10
NPort 6150	1-port RS-232/422/485 secure device server

NPort 6250	Page 7-12
NPort 6250	2-port secure device server, RS-232/422/485 to Ethernet
NPort 6250-M-SC	2-port secure device server, RS-232/422/485 to multi-mode fiber (SC connector)
NPort 6250-S-SC	2-port secure device server, RS-232/422/485 to single-mode fiber (SC connector)

NPort 6450	Page 7-14
NPort 6450	4-port secure device server, RS-232/422/485 to Ethernet

NPort 6600	Page 7-17
NPort 6610-8	8-port RS-232 to Ethernet secure terminal server, 100 to 240 VAC power input
NPort 6610-8-48V	8-port RS-232 to Ethernet secure terminal server, ±48 VDC power input
NPort 6610-16	16-port RS-232 to Ethernet secure terminal server, 100 to 240 VAC power input
NPort 6610-16-48V	16-port RS-232 to Ethernet secure terminal server, ±48 VDC power input
NPort 6610-32	32-port RS-232 to Ethernet secure terminal server, 100 to 240 VAC power input
NPort 6610-32-48V	32-port RS-232 to Ethernet secure terminal server, ±48 VDC power input
NPort 6650-8	8-port RS-232/422/485 to Ethernet secure terminal server, 100 to 240 VAC power input
NPort 6650-8-48V	8-port RS-232/422/485 to Ethernet secure terminal server, ±48 VDC power input
NPort 6650-16	16-port RS-232/422/485 to Ethernet secure terminal server, 100 to 240 VAC power input
NPort 6650-16-48V	16-port RS-232/422/485 to Ethernet secure terminal server, ±48 VDC power input
NPort 6650-32	32-port RS-232/422/485 to Ethernet secure terminal server, 100 to 240 VAC power input
NPort 6650-32-48V	32-port RS-232/422/485 to Ethernet secure terminal server, ±48 VDC power input

NPort® DE-211/DE-311	Page 8-23
NPort® DE-211	1-port RS-232/422/485 device server with 10 Mbps Ethernet connection
NPort® DE-311	1-port RS-232/422/485 device server with 10/100 Mbps Ethernet connection

NPort® IA5000	Page 8-38
NPort® IA5150	1-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP), 0 to 55°C operating temperature
NPort® IA5150I	1-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP) and 2 KV optical isolation, 0 to 55°C operating temperature
NPort® IA5150-M-SC	1-port RS-232/422/485 device server with 1 100BaseF(X) multi-mode fiber port (SC connectors), 0 to 55°C operating temperature
NPort® IA5150-S-SC	1-port RS-232/422/485 device server with 1 100BaseF(X) single-mode fiber port (SC connectors), 0 to 55°C operating temperature
NPort® IA5150I-M-SC	1-port RS-232/422/485 device server with 1 100BaseF(X) multi-mode fiber port (SC connectors) and 2 KV optical isolation, 0 to 55°C operating temperature
NPort® IA5150I-S-SC	1-port RS-232/422/485 device server with 1 100BaseF(X) single-mode fiber port (SC connectors) and 2 KV optical isolation, 0 to 55°C operating temperature
NPort® IA5250	2-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP), 0 to 55°C operating temperature
NPort® IA5150-T	1-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP), -40 to 75°C operating temperature
NPort® IA5150I-T	1-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP) and 2 KV optical isolation, -40 to 75°C operating temperature
NPort® IA5150-M-SC-T	1-port RS-232/422/485 device server with 1 100BaseF(X) multi-mode fiber port (SC connectors), -40 to 75°C operating temperature
NPort® IA5150-S-SC-T	1-port RS-232/422/485 device server with 1 100BaseF(X) single-mode fiber port (SC connectors), -40 to 75°C operating temperature
NPort® IA5150I-M-SC-T	1-port RS-232/422/485 device server with 1 100BaseF(X) multi-mode fiber port (SC connectors) and 2 KV optical isolation, -40 to 75°C operating temperature
NPort® IA5150I-S-SC-T	1-port RS-232/422/485 device server with 1 100BaseF(X) single-mode fiber port (SC connectors) and 2 KV optical isolation, -40 to 75°C operating temperature
NPort® IA5250-T	2-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP), -40 to 75°C operating temperature

NPort® S8000	Page 8-16
NPort® S8455I-MM-SC	5-port Ethernet switch and 4-port serial device server combo

NPort W2004	Page 13-24
NPort W2004-US	4-port RS-232/422/485 wireless device server with 802.11b/g WLAN, antenna, US band, US plug
NPort W2004-EU	4-port RS-232/422/485 wireless device server with 802.11b/g WLAN, antenna, Euro band, Euro plug
NPort W2004-CN	4-port RS-232/422/485 wireless device server with 802.11b/g WLAN, antenna, Euro band, US plug, CCC
NPort W2004-UK	4-port RS-232/422/485 wireless device server with 802.11b/g WLAN, antenna, Euro band, UK plug
NPort W2004-SAA	4-port RS-232/422/485 wireless device server with 802.11b/g WLAN, antenna, Euro band, Australia plug

NPort W2150/W2250 Plus	Page 13-26
NPort W2150 Plus-US	1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, US band, US plug, 0 to 55°C operating temperature
NPort W2150 Plus-EU	1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, Euro plug, 0 to 55°C operating temperature
NPort W2150 Plus-CN	1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, US plug, CCC, 0 to 55°C operating temperature
NPort W2150 Plus-UK	1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, UK plug, 0 to 55°C operating temperature
NPort W2150 Plus-SAA	1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, Australia plug, 0 to 55°C operating temperature
NPort W2150 Plus-JP	1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Japan band, Japan plug, 0 to 55°C operating temperature
NPort W2250 Plus-US	2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, US band, US plug, 0 to 55°C operating temperature
NPort W2250 Plus-EU	2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, Euro plug, 0 to 55°C operating temperature
NPort W2250 Plus-CN	2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, US plug, CCC
NPort W2250 Plus-UK	2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, UK plug, 0 to 55°C operating temperature
NPort W2250 Plus-SAA	2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, Australian plug, 0 to 55°C operating temperature
NPort W2250 Plus-JP	2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Japan band, Japan plug, 0 to 55°C operating temperature
NPort W2150 Plus-T	1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN (includes US, Euro, Japan band), -40 to 75°C operating temperature
NPort W2250 Plus-T	2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN (includes US, Euro, Japan band), -40 to 75°C operating temperature

O

OnCell 5004/5104	Page 13-36
OnCell 5004	4-port 10/100M Ethernet to GSM/GPRS cellular router
OnCell 5104	4-port 10/100M Ethernet to GSM/GPRS cellular router, IA design

OnCell 5004/5104-HSDPA	Page 13-34
OnCell 5004-HSDPA	4-port 10/100M Ethernet to UMTS/HSDPA cellular router
OnCell 5104-HSDPA	4-port 10/100M Ethernet to UMTS/HSDPA cellular router, IA design

OnCell G2110	Page 13-44
OnCell G2110	1-port RS-232 to GSM/GPRS modem
OnCell G2110-T	1-port RS-232 to GSM/GPRS modem, wide temperature (-30 to 75°C)
OnCell G2150I	1-port RS-232/422/485 to GSM/GPRS moden, with 2.5 KV optical isolation

OnCell G3110/G3150	Page 13-40
OnCell G3110	1-port RS-232 to GSM/GPRS/EDGE IP gateway
OnCell G3150	1-port RS-232/422/485 to GSM/GPRS/EDGE IP gateway

OnCell G3110/G3150-HSDPA	Page 13-38
OnCell G3110-HSDPA	1-port RS-232 to UMTS/HSDPA IP gateway
OnCell G3150-HSDPA	1-port RS-232/422/485 to UMTS/HSDPA IP gateway

OnCell G3111/G3151/G3211/G3251	Page 13-42
OnCell G3111	1-port RS-232 to GSM/GPRS IP modem
OnCell G3151	1-port RS-232/422/485 to GSM/GPRS IP modem
OnCell G3211	2-port RS-232 to GSM/GPRS IP Modem
OnCell G3251	2-port RS-232/422/485 to GSM/GPRS IP Modem

OPT8x Series 8-port Connection Boxes	Page A-3
OPT8-M9	8-port RS-232 connection box with TxD RxD LEDs (board-side: DB62 male x 1; device-side: DB9 male x 8)
OPT8-RJ45	8-port RS-232 connection box (board-side: DB62 male x 1; device-side: 8-pin RJ45 x 8)
OPT8A	8-port RS-232 connection box with TxD, RxD LEDs (board-side: DB62 male x 1; device-side: DB25 female x 8)
OPT8S	8-port RS-232 connection box with TxD, RxD LEDs, 25 KV ESD protection, and 2 KV EFT protection (board-side: DB62 male x 1; device-side: DB25 female x 8)
OPT8B	8-port RS-232 connection box with TxD, RxD LEDs (board-side: DB62 male x 1; device-side: DB25 male x 8)
OPT8Z	8-port RS-422 connection box with TxD, RxD LEDs (board-side: DB62 male x 1; device-side: DB25 female x 8)
OPT8F	8-port RS-422 connection box with TxD, RxD LEDs and 500 V optical isolation protection (board-side: DB62 male x 1; device-side: DB25 female x 8)
OPT8K	8-port RS-422/485 connection box with TxD, RxD LEDs, 16 KV ESD protection, and 1 KV EFT surge protection (board-side: DB62 male x 1; device-side: DB25 female x 8)

P

PM-7200 Series Interface Modules	Page 4-31
PM-7200-2GTXSFP	Gigabit Ethernet module with 2 10/100/1000BaseT(X) or 1000BaseSFP slot combo ports (see SFP-1G ordering information for available Gigabit Ethernet modules.)
PM-7200-4GTXSFP	Gigabit Ethernet module with 4 10/100/1000BaseT(X) or 1000BaseSFP slot combo ports (see SFP-1G ordering information for available Gigabit Ethernet modules.)
PM-7200-8TX	Fast Ethernet module with 8 10/100BaseT(X) ports
PM-7200-6MSC	Fast Ethernet module with 6 100BaseFX multi-mode ports with SC connectors
PM-7200-6MST	Fast Ethernet module with 6 100BaseFX multi-mode ports with ST connectors
PM-7200-6SSC	Fast Ethernet module with 6 100BaseFX single-mode ports with SC connectors
PM-7200-4MSC2TX	Fast Ethernet module with 4 100BaseFX multi-mode ports with SC connectors and 2 10/100BaseT(X) ports
PM-7200-4MST2TX	Fast Ethernet module with 4 100BaseFX multi-mode ports with ST connectors and 2 10/100BaseT(X) ports
PM-7200-4SSC2TX	Fast Ethernet module with 4 100BaseFX single-mode ports with SC connectors and 2 10/100BaseT(X) ports
PM-7200-2MSC4TX	Fast Ethernet module with 2 100BaseFX multi-mode ports with SC connectors and 4 10/100BaseT(X) ports
PM-7200-2MST4TX	Fast Ethernet module with 2 100BaseFX multi-mode ports with ST connectors and 4 10/100BaseT(X) ports
PM-7200-2SSC4TX	Fast Ethernet module with 2 100BaseFX single-mode ports with SC connectors and 4 10/100BaseT(X) ports
PM-7200-1LSC6TX	Fast Ethernet module with 1 100BaseFX single-mode port with SC connector for 80km transmission and 6 10/100BaseT(X) ports
PM-7200-1MSC6TX	Fast Ethernet module with 1 100BaseFX multi-mode port with SC connector and 6 10/100BaseT(X) ports
PM-7200-1MST6TX	Fast Ethernet module with 1 100BaseFX multi-mode port with ST connector and 6 10/100BaseT(X) ports
PM-7200-1SSC6TX	Fast Ethernet module with 1 100BaseFX single-mode port with SC connector and 6 10/100BaseT(X) ports
PM-7200-2MSC	Fast Ethernet module with 2 100BaseFX multi-mode ports with SC connectors
PM-7200-2MST	Fast Ethernet module with 2 100BaseFX multi-mode ports with ST connectors
PM-7200-2SSC	Fast Ethernet module with 2 100BaseFX single-mode ports with SC connectors
PM-7200-1MSC	Fast Ethernet module with 1 100BaseFX multi-mode port with SC connector

PM-7200-1MST	Fast Ethernet module with 1 100BaseFX multi-mode port with ST connector
PM-7200-1SSC	Fast Ethernet module with 1 100BaseFX single-mode port with SC connector
PM-7200-8PoE	Fast Ethernet module with 8 10/100BaseT(X) PoE ports
PM-7200-8SFP	Fast Ethernet module with 8 100BaseSFP slots
PM-7200-4M12	Fast Ethernet module with 4 10/100BaseT(X) ports with M12 connectors

POS-104UL	Page 10-60
POS-104UL-DB9	4-port RS-232 low profile Universal PCI board with serial port power, 0 to 55°C operating temperature (DB9 male cable included)
POS-104UL-T	4-port RS-232 low profile Universal PCI board with serial port power, -40 to 85°C operating temperature

Power Jack to Terminal Block Cable	Page A-7
CBL-PJ210W-10	Power jack to terminal block cable

PT-7324	Page 4-29
PT-7324-F-LV	IEC 61850-3 smart rackmount Ethernet switch system with 22 10/100BaseT(X) ports, and 1 slot for fast Ethernet or Gigabit Ethernet modules, for a total of up to 24 or 22+2G ports, cabling on front panel, 1 power supply (12/24/48 VDC), -40 to 85°C operating temperature
PT-7324-R-LV	IEC 61850-3 smart rackmount Ethernet switch system with 22 10/100BaseT(X) ports, and 1 slot for fast Ethernet or Gigabit Ethernet modules, for a total of up to 24 or 22+2G ports, cabling on rear panel, 1 power supply (12/24/48 VDC), -40 to 85°C operating temperature
PT-7324-F-HV	IEC 61850-3 smart rackmount Ethernet switch system with 22 10/100BaseT(X) ports, and 1 slot for fast Ethernet or Gigabit Ethernet modules, for a total of up to 24 or 22+2G ports, cabling on front panel, 1 power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PT-7324-R-HV	IEC 61850-3 smart rackmount Ethernet switch system with 22 10/100BaseT(X) ports, and 1 slot for fast Ethernet or Gigabit Ethernet modules, for a total of up to 24 or 22+2G ports, cabling on rear panel, 1 power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature

NOTE: See the PM-7200 series ordering information for available Gigabit and fast Ethernet modules.

PT-7710	Page 4-26
PT-7710-F-LV	IEC 61850-3 modular managed rackmount Ethernet switch system with 1 slot for fast Ethernet modules, and 1 slot for fast Ethernet or Gigabit Ethernet modules, for a total of up to 10 or 8+2G ports, cabling on front panel, 1 power supply (12/24/48 VDC), -40 to 85°C operating temperature
PT-7710-D-LV	IEC 61850-3 modular managed rackmount Ethernet switch system with 1 slot for fast Ethernet modules, and 1 slot for fast Ethernet or Gigabit Ethernet modules, for a total of up to 10 or 8+2G ports, cabling on bottom panel, 1 power supply (12/24/48 VDC), -40 to 85°C operating temperature
PT-7710-F-HV	IEC 61850-3 modular managed rackmount Ethernet switch system with 1 slot for fast Ethernet modules, and 1 slot for fast Ethernet or Gigabit Ethernet modules, for a total of up to 10 or 8+2G ports, cabling on front panel, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PT-7710-D-HV	IEC 61850-3 modular managed rackmount Ethernet switch system with 1 slot for fast Ethernet modules, and 1 slot for fast Ethernet or Gigabit Ethernet modules, for a total of up to 10 or 8+2G ports, cabling on bottom panel, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature

NOTE: See the PM-7200 series ordering information for available Gigabit and fast Ethernet modules.

PT-7728	Page 4-23
PT-7728-F-24	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 1 isolated power supply (24 VDC), -40 to 85°C operating temperature
PT-7728-R-24	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 1 isolated power supply (24 VDC), -40 to 85°C operating temperature
PT-7728-F-24-24	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 2 isolated power supplies (24 VDC), -40 to 85°C operating temperature
PT-7728-R-24-24	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 2 isolated power supplies (24 VDC), -40 to 85°C operating temperature
PT-7728-F-24-48	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 2 isolated power supplies (24 and 48 VDC), -40 to 85°C operating temperature
PT-7728-R-24-48	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 2 isolated power supplies (24 and 48 VDC), -40 to 85°C operating temperature
PT-7728-F-24-HV	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 2 isolated power supplies (24 VDC and 88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PT-7728-R-24-HV	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 2 isolated power supplies (24 VDC and 88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PT-7728-F-48	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 1 isolated power supply (48 VDC), -40 to 85°C operating temperature
PT-7728-R-48	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 1 isolated power supply (48 VDC), -40 to 85°C operating temperature
PT-7728-F-48-48	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 2 isolated power supplies (48 VDC), -40 to 85°C operating temperature
PT-7728-R-48-48	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 2 isolated power supplies (48 VDC), -40 to 85°C operating temperature
PT-7728-F-48-HV	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 2 isolated power supplies (48 VDC and 88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PT-7728-R-48-HV	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 2 isolated power supplies (48 VDC and 88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PT-7728-F-HV	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PT-7728-R-HV	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PT-7728-F-HV-HV	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 2 isolated power supplies (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PT-7728-R-HV-HV	IEC 61850-3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 2 isolated power supplies (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature

NOTE: See the PM-7200 series ordering information for available Gigabit and fast Ethernet modules.

PT-7828	Page 4-20
PT-7828-F-24	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 1 isolated power supply (24 VDC), -40 to 85°C operating temperature
PT-7828-R-24	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 1 isolated power supply (24 VDC), -40 to 85°C operating temperature
PT-7828-F-24-24	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 2 isolated power supplies (24 VDC), -40 to 85°C operating temperature
PT-7828-R-24-24	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 2 isolated power supplies (24 VDC), -40 to 85°C operating temperature
PT-7828-F-24-48	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 2 isolated power supplies (24 and 48 VDC), -40 to 85°C operating temperature
PT-7828-R-24-48	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 2 isolated power supplies (24 and 48 VDC), -40 to 85°C operating temperature
PT-7828-F-24-HV	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 2 isolated power supplies (24 VDC and 88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PT-7828-R-24-HV	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 2 isolated power supplies (24 VDC and 88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PT-7828-F-48	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 1 isolated power supply (48 VDC), -40 to 85°C operating temperature
PT-7828-R-48	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 1 isolated power supply (48 VDC), -40 to 85°C operating temperature
PT-7828-F-48-48	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 2 isolated power supplies (48 VDC), -40 to 85°C operating temperature
PT-7828-R-48-48	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 2 isolated power supplies (48 VDC), -40 to 85°C operating temperature
PT-7828-F-48-HV	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 2 isolated power supplies (48 VDC and 88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PT-7828-R-48-HV	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 2 isolated power supplies (48 VDC and 88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PT-7828-F-HV	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PT-7828-R-HV	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PT-7828-F-HV-HV	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on front panel, 2 isolated power supplies (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PT-7828-R-HV-HV	IEC 61850-3 Layer 3 modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, cabling on rear panel, 2 isolated power supplies (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature

NOTE: See the PM-7200 series ordering information for available Gigabit and fast Ethernet modules.

PWC-xxxx Series Power Cords	Page A-10
PWC-C13US-3B-183	Power cord with US plug type
PWC-C13EU-2B-183	Power cord with Euro plug type
PWC-C13UK-3B-183	Power cord with UK plug type
PWC-C13JP-3B-183	Power cord with Japan plug type
PWC-C13AU-3B-183	Power cord with AU plug type
PWC-C13CN-3B-183	Power cord with CN plug type

PWR-xxxx Series Power Adaptors	Page A-9
PWR-12120-USJP-S3	L-Type (5.5/2.1/9.5) power adaptor, 1.2 A @ 12 VDC output, US plug
PWR-12150-CN-S1	L-Type (5.5/2.1/9.0) power adaptor, 1.5 A @ 12 VDC output, CN plug
PWR-12120-USJP-S2	L-Type (5.5/2.1/9.5) power adaptor, 1.5 A @ 12 VDC output, CN plug
PWR-12120-DT-S2	S-Type (5.5/2.1/7.5) power adaptor, 1.2 A @ 12 VDC output
PWR-12200-DT-S1	S-Type (5.5/2.1/7.5) power adaptor, 2 A @ 12 VDC output
PWR-12042-US-S2	L-Type (5.5/2.1/9.0) power adaptor, 420 mA @ 12 VDC output, US plug
PWR-12042-EU-S1	L-Type (5.5/2.1/9.0) power adaptor, 420 mA @ 12 VDC output, Euro plug
PWR-12042-UK-S1	L-Type (5.5/2.1/9.0) power adaptor, 420 mA @ 12 VDC output, Euro plug
PWR-12040-AU-S1	L-Type (5.5/2.1/9.0) power adaptor, 400 mA @ 12 VDC output, AU plug
PWR-12120-AU-S2	L-Type (5.5/2.1/9.0) power adaptor, 1.2 A @ 12 VDC output, AU plug
PWR-12150-EU-S2	L-Type (5.5/2.1/9.0) power adaptor, 1.5 A @ 12 VDC output, Euro plug
PWR-12150-UK-S2	L-Type (5.5/2.1/9.0) power adaptor, 1.5 A @ 12 VDC output, UK plug
PWR-12200-DT-S2	L-Type (5.5/2.1/7.5) power adaptor, 2 A @ 12 VDC output
PWR-12120-DT-S2	I-Type (5.5/2.1/12) power adaptor, 1.2 A @ 12 VDC output

R

RJ45 to DB9 Adaptors	Page A-7
ADP-RJ458P-DB9M	RJ45 to DB9 male adaptor
ADP-RJ458P-DB9F	RJ45 to DB9 female adaptor

RK-xx Series Mounting Kits	Page A-12
RK-4U	4U-high 19" rack mounting kit for EDS DIN-Rail Ethernet switches

Note: See the DK-xx Series and WK-xx Series Mounting Kits for related products.

S

SFP-1FE	Page 3-47
SFP-1FEMLC-T	SFP module with 100Base multi-mode with LC connector for 4 km transmission, -40 to 85°C operating temperature
SFP-1FESLC-T	SFP module with 100Base single-mode with LC connector for 40 km transmission, -40 to 85°C operating temperature
SFP-1FELLC-T	SFP module with 100Base single-mode with LC connector for 80 km transmission, -40 to 85°C operating temperature

SFP-1G	Page 3-45
SFP-1GSXLC	SFP module with 1 1000BaseSX port with LC connector for 0.5 km transmission, 0 to 60°C operating temperature
SFP-1GLSXLC	SFP module with 1 1000BaseLSX port with LC connector for 2 km transmission, 0 to 60°C operating temperature
SFP-1GLXLC	SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, 0 to 60°C operating temperature
SFP-1GLHLC	SFP module with 1 1000BaseLX port with LC connector for 30 km transmission, 0 to 60°C operating temperature
SFP-1GLHXLC	SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, 0 to 60°C operating temperature
SFP-1GZXLC	SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, 0 to 60°C operating temperature
SFP-1GEZXLC	SFP module with 1 1000BaseEZX port with LC connector for 110 km transmission, 0 to 60°C operating temperature
SFP-1G10ALC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission, TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature
SFP-1G10BLC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission, TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature
SFP-1G20ALC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission, TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature
SFP-1G20BLC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission, TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature
SFP-1G40ALC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission, TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature
SFP-1G40BLC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission, TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature
SFP-1GSXLC-T	SFP module with 1 1000BaseSX port with LC connector for 0.5 km transmission, -20 to 75°C operating temperature
SFP-1GLSXLC-T	SFP module with 1 1000BaseLSX port with LC connector for 2 km transmission, -40 to 85°C operating temperature
SFP-1GLHLC-T	SFP module with 1 1000BaseLX port with LC connector for 30 km transmission, -40 to 85°C operating temperature
SFP-1GLXLC-T	SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, -40 to 85°C operating temperature
SFP-1GLHXLC-T	SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, -40 to 85°C operating temperature
SFP-1GZXLC-T	SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, -40 to 85°C operating temperature
SFP-1G10ALC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission, TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature
SFP-1G10BLC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission, TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature
SFP-1G20ALC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission, TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature
SFP-1G20BLC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission, TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature
SFP-1G40ALC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission, TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature
SFP-1G40BLC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission, TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature

SoftDVR™	Page 6-30
SoftDVR™ Pro	16-ch IP surveillance software with license key pro
SoftDVR™ Lite	4-ch IP surveillance software (download for free from Moxa's website)

SoftNVR	Page 6-27
SoftNVR-4	4-channel IP surveillance software with license key pro
SoftNVR-8	8-channel IP surveillance software with license key pro
SoftNVR-16	16-channel IP surveillance software with license key pro
SoftNVR-25	25-channel IP surveillance software with license key pro
SoftNVR-32	32-channel IP surveillance software with license key pro
SoftNVR-64	64-channel IP surveillance software with license key pro

SPL-24	Page 3-42
SPL-24	PoE splitter with maximum output of 12.95 W at 24 VDC, 0 to 60°C operating temperature
SPL-24-T	PoE splitter with maximum output of 12.95 W at 24 VDC, -40 to 75°C operating temperature

T

TB-xx Series Wiring Terminals and Terminal Blocks	Page A-7
TB-M9	DB9 male DIN-Rail wiring terminal
TB-F9	DB9 female DIN-Rail wiring terminal
TB-M25	DB25 male DIN-Rail wiring terminal
TB-F25	DB25 female DIN-Rail wiring terminal
TB-500F-103-5ESDV	3-pin Terminal Block
TB-500F-105-5ESDV	5-pin Terminal Block
TB-500F-107-5ESDV	7-pin Terminal Block
TB-500F-110-5ESDV	10-pin Terminal Block

TCC-80/80I	Page 12-20
TCC-80	Port-powered RS-232 to RS-422/485 converter with 15 KV serial ESD protection and terminal block on the RS-422/485 side
TCC-80-DB9	Port-powered RS-232 to RS-422/485 converter with 15 KV serial ESD protection and DB9 male connector on the RS-422/485 side
TCC-80I	Port-powered RS-232 to RS-422/485 converter with 15 KV serial ESD protection, terminal block on the RS-422/485 side, and 2.5 KV optical isolation
TCC-80I-DB9	Port-powered RS-232 to RS-422/485 converter with 15 KV serial ESD protection, DB9 male connector on the RS-422/485 side, and 2.5 KV optical isolation

TCC-82	Page 12-24
TCC-82	Port-powered RS-232 isolator with 4 KV isolation and 15 KV serial ESD protection

TCC-100/100I	Page 12-19
TCC-100	RS-232 to RS-422/485 converter, -20 to 60°C operating temperature
TCC-100I	RS-232 to RS-422/485 converter with optical isolation, -20 to 60°C operating temperature
TCC-100-T	RS-232 to RS-422/485 converter, -40 to 85°C operating temperature
TCC-100I-T	RS-232 to RS-422/485 converter with optical isolation, -40 to 85°C operating temperature

TCC-120/120I	Page 12-23
TCC-120	RS-422/485 converter/repeater
TCC-120I	RS-422/485 converter/repeater with 2 KV optical isolation

TCF-90	Page 12-17
TCF-90-M	Port-powered RS-232 to multi-mode optical fiber converter with ST connector for 5 km transmission
TCF-90-S	Port-powered RS-232 to single-mode optical fiber converter with ST connector for 40 km transmission

TCF-142	Page 12-14
TCF-142-M-SC	RS-232/422/485 to multi-mode optical fiber media converter with fiber ring support and SC connector, 0 to 60°C operating temperature
TCF-142-M-ST	RS-232/422/485 to multi-mode optical fiber media converter with fiber ring support and ST connector, 0 to 60°C operating temperature
TCF-142-S-SC	RS-232/422/485 to single-mode optical fiber media converter with fiber ring support and SC connector, 0 to 60°C operating temperature
TCF-142-S-ST	RS-232/422/485 to single-mode optical fiber media converter with fiber ring support and ST connector, 0 to 60°C operating temperature
TCF-142-M-SC-T	RS-232/422/485 to multi-mode optical fiber media converter with fiber ring support and SC connector, -40 to 75°C operating temperature
TCF-142-M-ST-T	RS-232/422/485 to multi-mode optical fiber media converter with fiber ring support and ST connector, -40 to 75°C operating temperature
TCF-142-S-SC-T	RS-232/422/485 to single-mode optical fiber media converter with fiber ring support and SC connector, -40 to 75°C operating temperature
TCF-142-S-ST-T	RS-232/422/485 to single-mode optical fiber media converter with fiber ring support and ST connector, -40 to 75°C operating temperature

TCF-142-RM	Page 12-9
TCF-142-M-SC-RM	RS-232/422/485 to multi-mode fiber slide-in module converter, SC connector
TCF-142-M-ST-RM	RS-232/422/485 to multi-mode fiber slide-in module converter, ST connector
TCF-142-S-SC-RM	RS-232/422/485 to single-mode fiber slide-in module converter, SC connector
TCF-142-S-ST-RM	RS-232/422/485 to single-mode fiber slide-in module converter, ST connector

TK-485 Tuning Kit	Page A-10
TK-485	Termination resistor plus tuning resistor in one handy kit. Ideal for daisy chained RS-485 (2-wire) networks.

TN-5308-4PoE	Page 4-12
TN-5308-4PoE	Unmanaged Ethernet switch with 4 10/100BaseT(X) ports and 4 PoE ports with M12 connectors, 0 to 60°C operating temperature
TN-5308-4PoE-T	Unmanaged Ethernet switch with 4 10/100BaseT(X) ports and 4 PoE ports with M12 connectors, -40 to 75°C operating temperature

TN-5308	Page 4-10
TN-5308-LV	Unmanaged Ethernet switch with 8 10/100BaseT(X) ports with M12 connectors, 7–60 VDC, 0 to 60°C operating temperature
TN-5308-MV	Unmanaged Ethernet switch with 8 10/100BaseT(X) ports with M12 connectors, 50.4–154 VDC, 0 to 60°C operating temperature
TN-5308-LV-T	Unmanaged Ethernet switch with 8 10/100BaseT(X) ports with M12 connectors, 7–60 VDC, -40 to 75°C operating temperature
TN-5308-MV-T	Unmanaged Ethernet switch with 8 10/100BaseT(X) ports with M12 connectors, 50.4–154 VDC, -40 to 75°C operating temperature

TN-5508	Page 4-7
TN-5508-LV-LV	Managed Ethernet switch with 8 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (12/24/36/48 VDC), 0 to 60°C operating temperature
TN-5508-LV-MV	Managed Ethernet switch with 8 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (12/24/36/48 VDC and 72/96/110 VDC), 0 to 60°C operating temperature
TN-5508-LV-HV	Managed Ethernet switch with 8 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (12/24/36/48 VDC and 88-300 VDC or 85-264 VAC), 0 to 60°C operating temperature
TN-5508-LV-LV-T	Managed Ethernet switch with 8 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (12/24/36/48 VDC), -40 to 75°C operating temperature
TN-5508-LV-MV-T	Managed Ethernet switch with 8 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (12/24/36/48 VDC and 72/96/110 VDC), -40 to 75°C operating temperature
TN-5508-LV-HV-T	Managed Ethernet switch with 8 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (12/24/36/48 VDC and 88-300 VDC or 85-264 VAC), -40 to 75°C operating temperature

TN-5510	Page 4-7
TN-5510-2GTX-LV-LV	Managed Ethernet switch with 8 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (12/24/36/48 VDC), 0 to 60°C operating temperature
TN-5510-2GTX-LV-MV	Managed Ethernet switch with 8 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (12/24/36/48 VDC and 72/96/110 VDC), 0 to 60°C operating temperature
TN-5510-2GTX-LV-HV	Managed Ethernet switch with 8 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (12/24/36/48 VDC and 88-300 VDC or 85-264 VAC), 0 to 60°C operating temperature
TN-5510-2GTX-LV-LV-T	Managed Ethernet switch with 8 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (12/24/36/48 VDC), -40 to 75°C operating temperature
TN-5510-2GTX-LV-MV-T	Managed Ethernet switch with 8 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (12/24/36/48 VDC and 72/96/110 VDC), -40 to 75°C operating temperature
TN-5510-2GTX-LV-HV-T	Managed Ethernet switch with 8 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (12/24/36/48 VDC and 88-300 VDC or 85-264 VAC), -40 to 75°C operating temperature

TN-5516	Page 4-7
TN-5516-LV-LV	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (12/24/36/48 VDC), 0 to 60°C operating temperature
TN-5516-LV-MV	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (12/24/36/48 VDC and 72/96/110 VDC), 0 to 60°C operating temperature
TN-5516-LV-HV	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (12/24/36/48 VDC and 88-300 VDC or 85-264 VAC), 0 to 60°C operating temperature
TN-5516-MV-MV	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (72/96/110 VDC), 0 to 60°C operating temperature
TN-5516-MV-HV	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (72/96/110 VDC and 88-300 VDC or 85-264 VAC), 0 to 60°C operating temperature
TN-5516-HV-HV	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (88-300 VDC or 85-264 VAC), 0 to 60°C operating temperature
TN-5516-LV-LV-T	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (12/24/36/48 VDC), -40 to 75°C operating temperature
TN-5516-LV-MV-T	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (12/24/36/48 VDC and 72/96/110 VDC), -40 to 75°C operating temperature
TN-5516-LV-HV-T	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (12/24/36/48 VDC and 88-300 VDC or 85-264 VAC), -40 to 75°C operating temperature
TN-5516-MV-MV-T	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (72/96/110 VDC), -40 to 75°C operating temperature
TN-5516-MV-HV-T	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (72/96/110 VDC and 88-300 VDC or 85-264 VAC), -40 to 75°C operating temperature
TN-5516-HV-HV-T	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, dual redundant power inputs (88-300 VDC or 85-264 VAC), -40 to 75°C operating temperature

TN-5518	Page 4-7
TN-5518-2GTX-LV-LV	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (12/24/36/48 VDC), 0 to 60°C operating temperature
TN-5518-2GTX-LV-MV	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (12/24/36/48 VDC and 72/96/110 VDC), 0 to 60°C operating temperature
TN-5518-2GTX-LV-HV	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (12/24/36/48 VDC and 88-300 VDC or 85-264 VAC), 0 to 60°C operating temperature
TN-5518-2GTX-MV-MV	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (72/96/110 VDC), 0 to 60°C operating temperature
TN-5518-2GTX-MV-HV	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (72/96/110 VDC and 88-300 VDC or 85-264 VAC), 0 to 60°C operating temperature
TN-5518-2GTX-HV-HV	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (88-300 VDC or 85-264 VAC), 0 to 60°C operating temperature
TN-5518-2GTX-LV-LV-T	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (12/24/36/48 VDC), -40 to 75°C operating temperature
TN-5518-2GTX-LV-MV-T	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (12/24/36/48 VDC and 72/96/110 VDC), -40 to 75°C operating temperature
TN-5518-2GTX-LV-HV-T	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (12/24/36/48 VDC and 88-300 VDC or 85-264 VAC), -40 to 75°C operating temperature
TN-5518-2GTX-MV-MV-T	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (72/96/110 VDC), -40 to 75°C operating temperature
TN-5518-2GTX-MV-HV-T	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (72/96/110 VDC and 88-300 VDC or 85-264 VAC), -40 to 75°C operating temperature
TN-5518-2GTX-HV-HV-T	Managed Ethernet switch with 16 10/100BaseT(X) ports with M12 connectors, and 2 10/100/1000BaseT(X) with circular field connectors (RJ45-type) with relay bypass function, dual redundant power inputs (88-300 VDC or 85-264 VAC), -40 to 75°C operating temperature

TRC-190	Page 12-7
TRC-190-AC	Rack chassis, 2U, single 110 to 240 VAC input, with 19 slots on front panel
TRC-190-DC	Rack chassis, 2U, single 12 to 48 VDC input, with 19 slots on front panel (coming soon)

U

UC-7101	Page 15-46
UC-7101-LX	Mini RISC-based embedded computer with 1 serial port, LAN, µClinux OS, -10 to 60°C operating temperature
UC-7101-T-LX	Mini RISC-based embedded computer with 1 serial port, LAN, µClinux OS, -40 to 75°C operating temperature

UC-7110/7112	Page 15-43
UC-7110-LX	Mini RISC-based embedded computer with 2 serial ports, dual LANs, µClinux OS, -10 to 60°C operating temperature
UC-7112-LX	Mini RISC-based embedded computer with 2 serial ports, dual LANs, SD, µClinux 2.6 OS, -10 to 60°C operating temperature
UC-7112-LX Plus	Mini RISC-based embedded computer with 2 serial ports, dual LANs, SD, Linux 2.6 OS, -10 to 60°C operating temperature
UC-7110-T-LX	Mini RISC-based embedded computer with 2 serial ports, dual LANs, µClinux OS, -40 to 75°C operating temperature

UC-7122/7124	Page 15-40
UC-7122-CE	Mini RISC-based embedded computer with 2 serial ports, dual LANs, SD, USB, WinCE 5.0, -10 to 60°C operating temperature
UC-7124-CE	Mini RISC-based embedded computer with 4 serial ports, dual LANs, SD, USB, WinCE 5.0, -10 to 60°C operating temperature
UC-7122-T-CE	Mini RISC-based embedded computer with 2 serial ports, dual LANs, SD, USB, WinCE 5.0, -40 to 75°C operating temperature
UC-7124-T-CE	Mini RISC-based embedded computer with 4 serial ports, dual LANs, SD, USB, WinCE 5.0, -40 to 75°C operating temperature

UC-7402	Page 15-32
UC-7402-LX	RISC-based IXP422 embedded computer with dual LANs, PCMCIA, CompactFlash, Linux 2.4
UC-7402-LX-Plus	RISC-based IXP425 embedded computer with dual LANs, PCMCIA, CompactFlash, Linux 2.6

UC-7408	Page 15-34
UC-7408-LX	RISC-based IXP422 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, Linux 2.4, -10 to 60°C operating temperature
UC-7408-LX Plus	RISC-based IXP425 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, USB, Linux 2.6, -10 to 60°C operating temperature
UC-7408-CE	RISC-based IXP422 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, WinCE 5.0, -10 to 60°C operating temperature
UC-7408-T-LX	RISC-based IXP422 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, Linux 2.4, -40 to 75°C operating temperature
UC-7408-T-LX Plus	RISC-based IXP425 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, USB, Linux 2.6, -40 to 75°C operating temperature
UC-7408-T-CE	RISC-based IXP422 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, WinCE 5.0, -40 to 75°C operating temperature

UC-7410/7420	Page 15-37
UC-7410-LX	RISC-based IXP422 embedded computer with 8 serial ports, dual LANs, Linux 2.4
UC-7410-LX Plus	RISC-based IXP425 embedded computer with 8 serial ports, dual LANs, Linux 2.6
UC-7420-LX	RISC-based IXP422 embedded computer with 8 serial ports, dual LANs, USB, PCMCIA, CompactFlash, Linux 2.4
UC-7420-LX Plus	RISC-based IXP425 embedded computer with 8 serial ports, dual LANs, USB, PCMCIA, CompactFlash, Linux 2.6
UC-7410-CE	RISC-based IXP422 embedded computer with 8 serial ports, dual LANs, WinCE 5.0
UC-7420-CE	RISC-based IXP422 embedded computer with 8 serial ports, dual LANs, USB, PCMCIA, CompactFlash, WinCE 5.0

UC-8410	Page 15-23
UC-8410-LX	RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature
UC-8410-T-LX	RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

UC-8416	Page 15-26
UC-8416-LX	RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, 8 switch ports, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature
UC-8416-T-LX	RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, 8 switch ports, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

UC-8418	Page 15-29
UC-8418-LX	RISC-based industrial embedded computer with 8 serial ports, 12 DIs, 12 DOs, 3 LANs, 2 CAN ports, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature
UC-8418-T-LX	RISC-based industrial embedded computer with 8 serial ports, 12 DIs, 12 DOs, 3 LANs, 2 CAN ports, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

UPort™ 204/207	Page 11-29
UPort™ 204	4-port entry-level USB hub, adaptor included
UPort™ 207	7-port entry-level USB hub, adaptor included

UPort™ 404/407	Page 11-27
UPort™ 404	4-port industrial USB hub, adaptor included, 0 to 60°C operating temperature
UPort™ 407	7-port industrial USB hub, adaptor included, 0 to 60°C operating temperature
UPort™ 404-T	4-port industrial USB hub, adaptor included, -40 to 85°C operating temperature
UPort™ 407-T	7-port industrial USB hub, adaptor included, -40 to 85°C operating temperature

UPort™ 1110/1130/1150	Page 11-11
UPort™ 1110	1-port RS-232 USB-to-serial converter
UPort™ 1130	1-port RS-422/485 USB-to-serial converter
UPort™ 1150	1-port RS-232/422/485 USB-to-serial converter

UPort™ 1150I	Page 11-13
UPort™ 1150I	1-port RS-232/422/485 USB-to-serial converter with 2 KV optical isolation

UPort™ 1250/1250I	Page 11-15
UPort™ 1250	2-port RS-232/422/485 USB-to-serial converter
UPort™ 1250I:	2-port RS-232/422/485 USB-to-serial converter with 2 KV optical isolation, adaptor included

UPort™ 1400	Page 11-17
UPort™ 1410	4-port RS-232 USB-to-serial converter
UPort™ 1450	4-port RS-232/422/485 USB-to-serial converter, adaptor included
UPort™ 1450I	4-port RS-232/422/485 USB-to-serial converter with 2 KV optical isolation, adaptor included

UPort™ 1600-8	Page 11-19
UPort™ 1610-8	8-port RS-232 USB-to-serial converter, adaptor included
UPort™ 1650-8	8-port RS-232/422/485 USB-to-serial converter, adaptor included

UPort™ 1600-16	Page 11-21
UPort™ 1610-16	16-port RS-232 USB-to-serial converter
UPort™ 1650-16	16-port RS-232/422/485 USB-to-serial converter

UPort™ 2210/2410	Page 11-23
UPort™ 2210	2-port RS-232 USB-to-serial converter
UPort™ 2410	4-port RS-232 USB-to-serial converter

UPort™ 2230/2430	Page 11-25
UPort™ 2230	2-port RS-422/485 USB-to-serial converter
UPort™ 2430	4-port RS-422/485 USB-to-serial converter

V

V462	Page 15-8
V462-CE	x86 embedded computer with 4 serial ports, dual LANs, VGA, CompactFlash, PCMCIA, USB, and WinCE 6.0 OS, -10 to 60°C operating temperature
V462-XPE	x86 embedded computer with 4 serial ports, dual LANs, VGA, CompactFlash, PCMCIA, USB, and Windows XP Embedded OS, -10 to 60°C operating temperature
V462-T-CE	x86 embedded computer with 4 serial ports, dual LANs, VGA, CompactFlash, PCMCIA, USB, and WinCE 6.0 OS, -40 to 75°C operating temperature
V462-T-XPE	x86 embedded computer with 4 serial ports, dual LANs, VGA, CompactFlash, PCMCIA, USB, and Windows XP Embedded OS, -40 to 75°C operating temperature

V464	Page 15-11
V464-CE	x86 embedded computer with 4 serial ports, quad LANs, VGA, CompactFlash, USB, and WinCE 6.0 OS, -10 to 60°C operating temperature
V464-XPE	x86 embedded computer with 4 serial ports, quad LANs, VGA, CompactFlash, USB, and Windows XP Embedded OS, -10 to 60°C operating temperature
V464-T-CE	x86 embedded computer with 4 serial ports, quad LANs, VGA, CompactFlash, USB, and WinCE 6.0 OS, -40 to 75°C operating temperature
V464-T-XPE	x86 embedded computer with 4 serial ports, quad LANs, VGA, CompactFlash, USB, and Windows XP Embedded OS, -40 to 75°C operating temperature

V466	Page 15-14
V466-CE	x86 embedded computer with 4 serial ports, quad LANs, 8-port Ethernet switch, VGA, CompactFlash, USB, and WinCE 6.0 OS, -10 to 60°C operating temperature
V466-XPE	x86 embedded computer with 4 serial ports, quad LANs, 8-port Ethernet switch, VGA, CompactFlash, USB, and Windows XP Embedded OS, -10 to 60°C operating temperature
V466-T-CE	x86 embedded computer with 4 serial ports, quad LANs, 8-port Ethernet switch, VGA, CompactFlash, USB, and WinCE 6.0 OS, -40 to 75°C operating temperature
V466-T-XPE	x86 embedded computer with 4 serial ports, quad LANs, 8-port Ethernet switch, VGA, CompactFlash, USB, and Windows XP Embedded OS, -40 to 75°C operating temperature

V468	Page 15-17
V468-CE	x86 embedded computer with 4 serial ports, quad LANs, VGA, 8 DI, 8 DO, CompactFlash, USB, and WinCE 6.0 OS, -10 to 60°C operating temperature
V468-XPE	x86 embedded computer with 4 serial ports, quad LANs, VGA, 8 DI, 8 DO, CompactFlash, USB, and Windows XP Embedded OS, -10 to 60°C operating temperature
V468-T-CE	x86 embedded computer with 4 serial ports, quad LANs, VGA, 8 DI, 8 DO, CompactFlash, USB, and WinCE 6.0 OS, -40 to 75°C operating temperature
V468-T-XPE	x86 embedded computer with 4 serial ports, quad LANs, VGA, 8 DI, 8 DO, CompactFlash, USB, and Windows XP Embedded OS, -40 to 75°C operating temperature

V481	Page 15-20
V481-CE	x86 embedded computer with VGA, dual LANs, 8 serial ports, CompactFlash, USB, audio, WinCE 5.0, -10 to 60°C operating temperature
V481-XPE	x86 embedded computer with VGA, dual LANs, 8 serial ports, CompactFlash, USB, audio, Win XPE, -10 to 60°C operating temperature
V481-T-CE	x86 embedded computer with VGA, dual LANs, 8 serial ports, Compact Flash, USB, audio, WinCE 5.0, -35 to 75°C operating temperature
V481-T-XPE	x86 embedded computer with VGA, dual LANs, 8 serial ports, CompactFlash, USB, audio, Win XPE, -35 to 75°C operating temperature

VP-xxxx Series Mounting Accessories for the VPort 25	Page 6-26
VP-MK	Mounting kit for mounting dome camera onto gooseneck/straight tube/mini pendant
VP-ST1/VP-ST2	Straight tube, 250/500 mm height
VP-GT	Gooseneck tube
VP-MP	Mini pendant
VP-WBM	Wall box mounting for mounting gooseneck/mini pendants on a wall
VP-CST	Standard corner mounting plate for mounting gooseneck/mini pendant in a corner
VP-CSTM	Mini corner plate for mounting gooseneck/mini pendants in a corner
VP-PTD	Outdoor thin pole direct mounting kit for mounting gooseneck/mini pendant on a pole
VP-PWD	Outdoor wide pole direct mounting kit for mounting gooseneck/mini pendants on a pole
VP-SS1	Stainless steel straps for direct pole mounting or pole box on a pole

VPort 25	Page 6-24
VPort 25-CAM3S52N	Fixed Dome-type camera for outdoors with SuperHAD camera sensor and NTSC modulation
VPort 25-CAM3S52P	Fixed Dome-type camera for outdoors with SuperHAD camera sensor and PAL modulation
VPort 25-CAM3E52N	Fixed Dome-type camera for outdoors with Exview camera sensor and NTSC modulation
VPort 25-CAM3E52P	Fixed Dome-type camera for outdoors with Exview camera sensor and PAL modulation

VPort 251	Page 6-20
VPort 251	Full motion, 1-channel MJPEG/MPEG4 video encoder, 0 to 60°C operating temperature

VPort 254	Page 6-10
VPort 254	Rugged 4-channel MJPEG/MPEG4 industrial video encoder with 1 10/100BaseT(X) port, 0 to 60°C operating temperature
VPort 254-M-SC	Rugged 4-channel MJPEG/MPEG4 industrial video encoder with 1 multi-mode port with SC connector, 0 to 60°C operating temperature
VPort 254-S-SC	Rugged 4-channel MJPEG/MPEG4 industrial video encoder with 1 single-mode port with SC connector, 0 to 60°C operating temperature
VPort 254-T	Rugged 4-channel MJPEG/MPEG4 industrial video encoder with 1 10/100BaseT(X) port, -40 to 75°C operating temperature
VPort 254-M-SC-T	Rugged 4-channel MJPEG/MPEG4 industrial video encoder with 1 multi-mode port with SC connector, -40 to 75°C operating temperature
VPort 254-S-SC-T	Rugged 4-channel MJPEG/MPEG4 industrial video encoder with 1 single-mode port with SC connector, -40 to 75°C operating temperature

VPort 351	Page 6-13
VPort 351	Full motion, 1-channel MJPEG/MPEG4 industrial video encoder with 1 10/100BaseT(X) port, 0 to 60°C operating temperature
VPort 351-M-SC	Full motion, 1-channel MJPEG/MPEG4 industrial video encoder with 1 multi-mode port with SC connector, 0 to 60°C operating temperature
VPort 351-S-SC	Full motion, 1-channel MJPEG/MPEG4 industrial video encoder with 1 single-mode port with SC connector, 0 to 60°C operating temperature
VPort 351-T	Full motion, 1-channel MJPEG/MPEG4 industrial video encoder with 1 10/100BaseT(X) port, -40 to 75°C operating temperature
VPort 351-M-SC-T	Full motion, 1-channel MJPEG/MPEG4 industrial video encoder with 1 multi-mode port with SC connector, -40 to 75°C operating temperature
VPort 351-S-SC-T	Full motion, 1-channel MJPEG/MPEG4 industrial video encoder with 1 single-mode port with SC connector, -40 to 75°C operating temperature

VPort 354	Page 6-7
VPort 354	Full motion, 4-channel MJPEG/MPEG4 industrial video encoder with 2 10/100BaseT(X) port, 0 to 60°C operating temperature
VPort 354-MM-SC	Full motion, 4-channel MJPEG/MPEG4 industrial video encoder with 2 multi-mode port with SC connector, 0 to 60°C operating temperature
VPort 354-SS-SC	Full motion, 4-channel MJPEG/MPEG4 industrial video encoder with 2 single-mode port with SC connector, 0 to 60°C operating temperature
VPort 354-T	Full motion, 4-channel MJPEG/MPEG4 industrial video encoder with 2 10/100BaseT(X) port, -40 to 75°C operating temperature
VPort 354-MM-SC-T	Full motion, 4-channel MJPEG/MPEG4 industrial video encoder with 2 multi-mode port with SC connector, -40 to 75°C operating temperature
VPort 354-SS-SC-T	Full motion, 4-channel MJPEG/MPEG4 industrial video encoder with 2 single-mode port with SC connector, -40 to 75°C operating temperature

VPort 2141	Page 6-18
VPort 2141	Compact 4-channel MJPEG video server with 100-240V power adaptor (1.5 A @ 12 VDC, or 1.25 A @ 12 VDC with UK plug)

VPort 3310	Page 6-16
VPort 3310	Rugged 1-channel MPEG4 industrial video server with 24 VDC redundant power inputs, 0 to 60°C operating temperature
VPort 3310-T	Rugged 1-channel MPEG4 industrial video server with 24 VDC redundant power inputs, -40 to 75°C operating temperature

VPort D351	Page 6-22
VPort D351	1-channel MJPEG/MPEG4 industrial video decoder with 12/24 VDC and 24 VAC redundant power inputs, 0 to 60°C operating temperature

VPort SDK PLUS	Page 6-32
VPort SDK PLUS	Free software development kit for customized systems with URL commands, ActiveX control SDK, and API SDK (download for free from Moxa's website)

W

W311/321/341		Page 17-4
W311-LX	Mini RISC-based wireless Linux computer with WLAN, 1 serial port, LAN, and SD	
W321-LX	Mini RISC-based wireless Linux computer with WLAN, 2 serial ports, LAN, and SD	
W341-LX	RISC-based wireless Linux computer with WLAN, 4 serial ports, LAN, SD, USB, and relay output	

W315/325/345		Page 17-8
W315-LX	Mini RISC-based wireless Linux computer with GSM/GPRS, 1 serial port, and LAN, and SD	
W325-LX	Mini RISC-based wireless Linux computer with GSM/GPRS, 2 serial ports, LAN, and SD	
W345-LX	RISC-based wireless Linux computer with GSM/GPRS, 4 serial ports, LAN, SD, USB, and relay output	

WE-2100T		Page 8-49
WE-2100T	1-port wireless module supporting IEEE 802.11a/b/g	
WE-2100T-ST	Starter Kit for the WE-2100T	

Wireless Accessories for AWK Products	
M12A-5P-IP68	Field-installable A-coded screw-in sensor connector, male (pages 13-17 and 13-19)
M12A-8P-IP68	Field-installable A-coded screw-in 8-pin connector, female (pages 13-17 and 13-19)
PLG-WPRJ	Field-installable RJ-type plug (pages 13-17 and 13-19)
DR-75-24	75W/3.2A DIN-Rail 24 VDC power supply with universal 85 to 264 VAC input (pages 13-21 and 13-23)
WK-46	Wall mounting kit (pages 13-21 and 13-23)
DK-DC50131	Din-Rail mounting kit, 50 x 131 mm (pages 13-17 and 13-19)
PK-DC2DOF	Pole-mounting kit (pages 13-17 and 13-19)
CRF-NO429N-3M	CFD400 cable, N-type male to N-type male, 3 meters (for outdoor AWK Series only, pages 13-17 and 13-19)
CRF-N0117SA-3M	CFD200 cable, N-type (male) to RP-SMA (male), 3 meters (for AWK-3121/3222 and NPort W Series, pages 13-21 and 13-23)

Wireless Accessories for OnCell Products		Page 13-48
3-pin Terminal Block	screw type, P/N: 1111000005200	
5-pin Terminal Block	screw type, P/N: 1111000005400	
10-pin Terminal Block	screw type, P/N: 1111211021212	

Wireless Antennas for AWK Products		Page 13-47
ANT-WSB-ANF-09	2.4 GHz, omni-directional, 9 dBi Antenna, N-type female connector	
ANT-WSB-PNF-12	2.4 GHz, directional/Panel, 12 dBi Antenna, N-type female connector	
WK-HA-1002SU	Swivel Mounting Kit, swivel angle 90° horizontal, 40° vertical (for ANT-WSB-PNF-12 only)	
ANT-WSB-PNF-18	2.4 GHz, directional/Panel, 18 dBi Antenna, N-type female connector	
ANT-WDB-ANF-0609	2.4/5 GHz, Dual-band omni-directional antenna, 6/9dBi antenna, N-type (female) connector	
ANT-WDB-PNF-1518	2.4/5 GHz, Dual-band directional/Panel, 15/18 dBi antenna, N-type (female) connector	
ANT-WSB5-ANF-12	5 GHz, omni-directional, 12 dBi Antenna, N-type female connector	
ANT-WSB5-PNF-18	5 GHz, directional/Panel, 18dBi antenna, N-type female connector	

Wireless Antennas for OnCell Products		Page 13-48
ANT-CQB-ASM-01	GSM/GPRS, omni 1dBi rubber SMA antenna	
ANT-CQB-AHSM-00-3m	Omni 0dBi/10cm, magnetic SMA quad-band GSM/GPRS antenna (impedance = 50 ohms), 3 m	
ANT-CQB-AHSM-03-3m	Omni 3dBi/25cm, magnetic SMA quad-band GSM/GPRS antenna (impedance = 50 ohms), 3 m	
ANT-CQB-AHSM-05-3m	Omni 5dBi/37cm, magnetic SMA quad-band GSM/GPRS antenna (impedance = 50 ohms), 3 m	
ANT-WCDMA-ASM-1.5	Omni 1.5dBi/10cm, magnetic SMA tri-band UMTS/HSDPA antenna (impedance = 50 ohms)	
ANT-WCDMA-AHSM-04-2.5m	Omni 4dBi/11cm, magnetic SMA tri-band UMTS/HSDPA antenna, 2.5 m (impedance = 50 ohms)	

WK-xx Series Mounting Kits		Page A-12
WK-32	Wall mounting kit for EDS-828/728 series modular DIN-Rail Ethernet switches	
WK-30	Wall mounting kit for EDS-205A/G205 series DIN-Rail Ethernet switches	
WK-46	Wall mounting kit for EDS DIN-Rail Ethernet switches (except for EDS-205/208/205A series)	

Note: See the DK-xx Series and RK-xx Series Mounting Kits for related products.

Glossary

A

ADDC (Automatic Data Direction Control)

Automatic Data Direction Control, or ADDC® for short, is an advanced technique for switching a 2-wire RS-485 transmitter on and off. ADDC® comes standard with Moxa's serial boards, serial device servers, and other products that transmit serial signals. Detailed configuration information can be found in your product's user's manual.

ASIC (Application Specific Integrated Circuit)

ASIC chips are custom designed to provide specialized computing functions, and are often used in place of general-purpose commercial logic chips. ASIC chips integrate several functions or logic control blocks into one single chip to lower manufacturing costs and simplify circuit board design.

Asynchronous Communication

Asynchronous communication refers to digital communication (such as between computers) in which there is no timing requirement for transmission, and in which the start of each individual character is signaled by the transmitting device.

B

Baudrate

Baudrate refers to data transmission speed. For RS-232/422/485 communication, baudrate is measured in bps (bits per second).

C

CompactPCI

CompactPCI is a very high performance industrial bus based on the standard PCI electrical specifications in rugged 3U or 6U Eurocard packaging. CompactPCI boards use a high quality 2 mm metric pin and socket connector that meets IEC and Bellcore standards. CompactPCI boards are inserted from the front of the chassis, with the I/O exposed through either the front or rear.

D

DTE (Data Terminal Equipment)

DTE stands for Data Terminal Equipment, as defined by the RS-232 specification. Examples of DTE are computers, printers, and terminals.

DCE (Data Communication Equipment)

DCE stands for Data Communication Equipment, as defined by the RS-232 specification. The basic function of a DCE device is to convert data from one interface, such as a digital signal, to another interface, such as an analog signal. A modem is one example of a DCE device.

DDNS (Dynamic DNS)

Dynamic DNS is a system that allows the domain name data stored in a domain name server to be updated in real time. The most common use of Dynamic DNS is allowing an Internet domain name to be assigned to a computer that has a dynamic IP address. This makes it possible for other sites on the Internet to establish connections to the machine without needing to track the IP address themselves.

F

FIFO (First In First Out)

FIFO is a term that describes the behavior of some buffers. FIFO buffers send out characters in the order that they are received, and are used to reduce the frequency of interrupt processes for UART chips, such as the C16550C, used in serial communications.

Flow Control

Flow Control is used to regulate data flow between 2 devices that have dramatically different data transmission speeds (such as a dot matrix serial printer and an RS-232 interface connection), and ensures that the two devices can communicate without data loss. RS-232 communication uses one of two basic approaches to enforce Flow Control.

Software approach: XON/XOFF
XON (0x11) and XOFF (0x13) are defined as special control codes that are used while data is being transmitted. The 2 codes are transmitted along with data characters. The operating scheme is straightforward. When either of the devices receives XOFF, it stops transmitting data until XON is received. The problem with this approach is that the data itself cannot contain these 2 codes.

Hardware approach: RTS/CTS
RTS (Request To Send) and CTS (Clear To Send) are separate signals, sent on separate wires, used for hardware Flow Control. RTS is an output signal that enables/disables data transmission for the other device. CTS is an input signal allowing the other device to enable/disable data transmission. The drawback to this approach is that 2 more wires are needed, but it also provides the capability to send binary data.

Hardware approach: DTR/DSR
Data terminal ready (DTR), another form of hardware flow control, is used by a device such as a printer to indicate that the device is ready to communicate with the system. This signal is used in conjunction with data set ready (DSR) generated by the system to control data flow. A positive voltage means data transmission is allowed, whereas a negative voltage signifies that data transmission should be suspended.

I

IP30/66/67/68

The Ingress Protection (IP) rating system is used to indicate the type of environment that a piece of electronic equipment can be used in. The first digit (e.g., the “3” in IP30) indicates the ability of the equipment to withstand the ingress of solid objects (including dust), and the second digit (e.g., the “0” in IP30) indicates the ability of the equipment to withstand the ingress of liquids.

IP30:
• Protected against solid objects with diameter greater than 2.5 mm.
• Provides no protection against liquids.

IP66:
• Provides complete protection against dust.
• Protected against low pressure jets of water.

IP67:
• Provides complete protection against dust.
• Protected when immersed in a liquid to a depth of 15 cm to 1 m, for brief periods of time.

IP68:
• Provides complete protection against dust.
• Protected when immersed in a liquid for prolonged periods of time.

Intelligent multiport board

An intelligent multiport board has on-board processing capability that allows it to cope with huge amounts of data, and in this way share the workload of the host processor. The on-board processor acts as a front end I/O processor to handle the necessary data processing before it sends data to the host processor, and on-board memory provides a large buffer that eliminates the chance of losing data during data transmission.

M

MTBF

MTBF, which stands for "mean time between failures," is a theoretical value used to indicate the reliability of a product. The MTBF value of a product depends on the known reliability of its various components, and is often expressed in hours.

N

Non-intelligent Multiport Board

A non-intelligent multiport board is equipped with UART chips and the necessary peripheral ICs. For this type of board, the board's data transmit/receive processing is done by the CPU on the motherboard. This creates a high workload for the CPU and puts a limit on the number of ports that can be installed in one computer. Non-intelligent multiport boards are an economical and robust solution for small scale applications.

O

Optical Isolation

Communication devices connected by long cables may be damaged by the mismatch between ground voltage levels at the two ends of the wire. Optical isolation uses photo cells to isolate the devices' sensitive components from this type of electrical damage.

P

Parallel Communication

Parallel communication refers to when data is transmitted byte-by-byte. That is, all bits of one or more bytes are transmitted simultaneously over separate wires.

PPPoE (Point-to-Point Protocol over Ethernet)

PPPoE, Point-to-Point Protocol over Ethernet, is a network protocol for encapsulating PPP frames inside Ethernet frames. It is used mainly with ADSL services for which individual users connect to the ADSL transceiver (modem) over Ethernet, and in plain Metro Ethernet networks.

R

RADIUS (Remote Authentication Dial In User Service)

RADIUS is an AAA (authentication, authorization, and accounting) protocol for controlling access to network resources. RADIUS is commonly used by ISPs and corporations that manage access to Internet or internal networks across an array of access technologies, including modems, DSL, wireless, and VPNs.

Real COM

The Real COM operation mode is used by Moxa's serial device servers to mimick the operation of a serial board. When a serial board is installed in a Windows-based computer, the operating system uses COM numbers (COM1, COM2, etc.) to identify the various serial ports. Real COM mode uses a dedicated driver installed on the computer to apply COM numbers to the serial ports on a serial device server that connects to the computer over a network.

Real Time Clock

Many computers and other electronic devices use a dedicated real time clock (RTC) to keep track of the actual time.

RIP (Routing Information Protocol)

The Routing Information Protocol (RIP) is one of the most commonly used interior gateway protocol (IGP) routing protocols on internal networks. RIP helps routers adapt dynamically to changes in network connections by communicating information about which networks each router can reach, and how far away the networks are.

RoHS

The Restriction on Hazardous Substances (RoHS) directive prohibits the use of lead, cadmium, mercury, hexavalent chromium, Polybrominated Biphenyl (PBB), and Polybrominated Diphenyl Ether (PBDE) flame retardants. RoHS was adopted by the European Union in 2006, and applies to most electronic products marketed in the European Union.

RS-232

RS-232 is a serial communications standard that provides asynchronous communication capabilities, such as hardware flow control, software flow control, and parity check. RS-232 has been widely used for many years, and most gears, instruments with digital control interfaces, and communications devices are equipped with the RS-232 interface. The typical transmission speed of an RS-232 connection is 9600 bps over a maximum distance of 15 meters.

RS-422

RS-422 is a serial communications standard that provides a much longer transmission distance compared to RS-232. RS-422 uses differential transmission technology to provide transmission speeds of up to 10 Mbps. The maximum transmission distance is 1.2 km at a transmission speed of 9600 bps.

RS-485

RS-485 is an enhanced version of RS-422 that also uses a 2-wire bus topology. A 2-wire RS-485 bus can be used to establish a very economical network. However, RS-485 only defines electrical signal specifications; users must define the software protocol themselves.

S

SECC (Steel, Electrogalvanized, Coldrolled, Coil)

SECC, which is an abbreviation for "steel, electrogalvanized, coldrolled, coil," refers to a particular type of steel used for many electronic devices designed for industrial applications.

Serial Communication

Serial communication refers to when data is transmitted bit-by-bit, or sequentially, over a single wire.

SNMP

SNMP stands for Simple Network Management Protocol. Devices that support SNMP can be configured and managed over the network.

Surge Protection

A surge protector protects electronic equipment by absorbing excess voltage caused by lightning, electrostatic discharges, and other forms of high voltage.

Synchronous Communication

Synchronous communication refers to digital communication (such as between computers) in which a common timing signal is established that dictates when individual bits can be transmitted. With synchronous communication, individual characters are not delimited, allowing for very high rates of data transfer.

T

TACACS+ (Terminal Access Controller Access-Control System Plus)

TACACS+ is a protocol that provides access control for routers, network access servers, and other networked computing devices through one or more centralized servers. TACACS+ provides separate authentication, authorization, and accounting services.

TCP/IP (Transmission Control Protocol/Internet Protocol)

TCP/IP is a set of protocols developed to allow computers to share resources across a network. It was developed by a community of researchers centered around the ARPAnet. The most accurate name for this set of protocols is the "Internet protocol suite." TCP and IP are just two of the protocols in this suite. Because TCP and IP are the best known of the protocols, it has become common to use the term TCP/IP to refer to the entire suite of protocols.

Termination Resistors

When an electrical signal travels through two different resistance junctions in a transmission line, the impedance mismatch will sometimes cause signal reflection. Signal reflection causes signal distortion, which in turn contributes to communication errors. The solution to this problem is to establish the same impedance at the line ends as in the line itself by terminating them with resistors. It is normally sufficient when the value of the termination resistor equals the characteristic impedance of the transmission line. The resistors should be added near the receiving side.

Throughput

Throughput refers to the performance of data transmission, and is measured by characters actually transmitted or received during a certain period of time. The throughput of a connection depends on CPU, memory, performance between the two devices, pattern of measurement, as well as the performance of the operating system. Throughput is usually measured in bps (bits per second).

U

UART (Universal Asynchronous Receiver-Transmitter)

UART chips control the data transmission and reception of a computer's serial communication devices. The UART chip converts digital data between parallel data inside the PC and serial data from an RS-232/422/485 line driver.

W

Watchdog Timer

A watchdog timer (WDT) is designed to reboot an operating system automatically if the operating system hangs or crashes. Devices with a WDT can run unattended for long periods of time.

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