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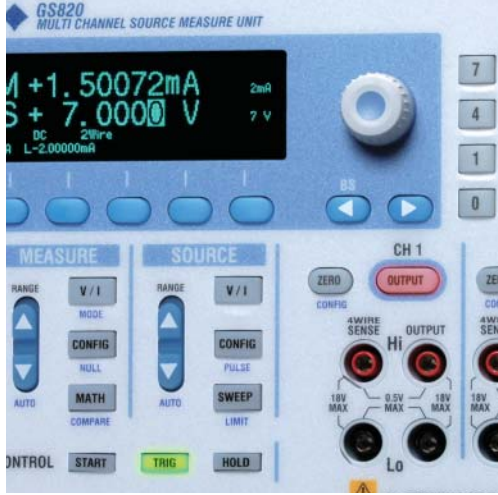


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Measuring Instruments All Products Guide

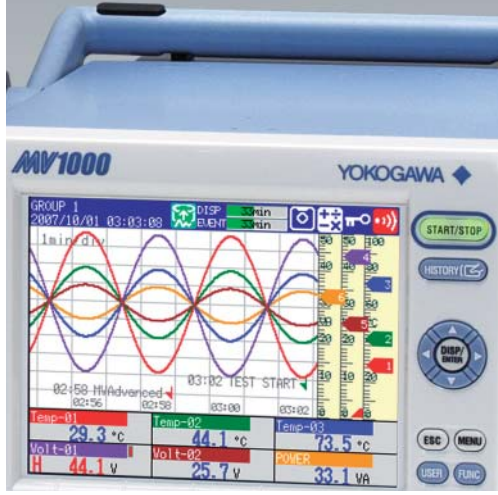
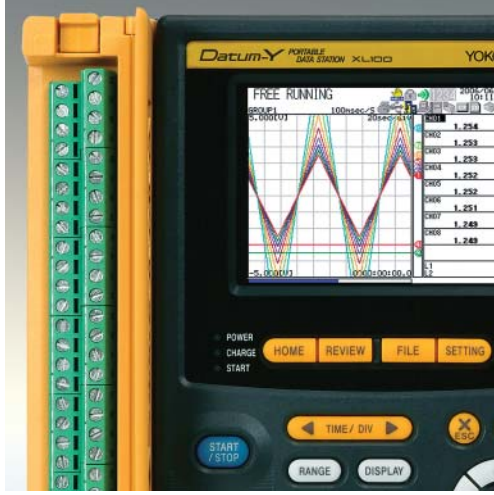


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Vol. 10

Bulletin 00A02B02-60E



New Products

Mixed Signal Oscilloscopes
DL9700 Series



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Mixed Signal Oscilloscopes
DL9500 Series



p4

Digital Oscilloscopes DL9000 (/G4, /F7, /F8 Option)
LIN-bus analysis function
Power supply analysis function



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Digital Oscilloscopes
DL1735E



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Active Probes
PBA1500(1.5 GHz)
PBA1000(1 GHz)



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Precision Power Analyzer WT3000
2A current input element



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Precision Power Analyzer WT3000 Optional
Cycle by Cycle measurement(CC)
Voltage Fluctuation/Flicker measurement(FL)



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Multi Channel Source Measure Unit
GS820



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OTDR
AQ7270



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Multi Application Test System AQ2200
Sensor Module



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Multi Application Test System AQ2200
OSW Module(1x16)
XFP Interface Module



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Data Acquisition Unit DAQMASTER
MW100
MX100

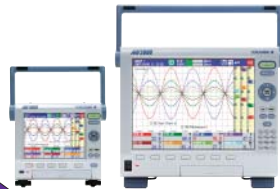


Upgrade



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MVAdvanced
MV1000
MV2000



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DXAdvanced
DX1000
DX2000



Upgrade



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For Green Series Controllers
PC-Based Parameter Setting Tool
LL100/LL200/LL1100/LL1200

Upgrade



USB connection available

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Data Acquisition Software Suite
DAQWORX

Upgrade



Support for Windows Vista

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Data Logger
Datum-Y XL120



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Application Software for Datum-Y
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Upgrade



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Handy Calibrator
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Handy Calibrator
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Products with this mark conform to the EMC standards (regulations on electromagnetic interference) of European Community.

Waveform Measuring Instruments

Power Measuring Instruments

Time Interval Analyzers

Function Generators/ Universal Counters

Digital Multimeters/ Resistance Meter/Scanner

Source Measure Units/ DC Source

Temperature Measuring Instruments

Pressure Measuring Instruments

PC-Based Measuring Instruments

Communications/ Network Test Instruments

Optical Measuring Instruments

Mobile/ Wireless Test Instruments

Recorders






Control Products

Data Acquisition Software Suite

Portable Test Instruments

Meters Products

- The DL series digital oscilloscopes have high-speed sampling and a wide range of bandwidths that can be utilized for design and development of electronic devices. They can also execute computations on repetitive waveforms and automatically extract waveform parameters. The DL Series offers an extensive selection of digital oscilloscopes with large-capacity memories, powerful triggering functions, unique History Memory function and internal printers. It also can save and load data to and from internal or external media.

Model	DL9700L/DL9500L Series	DL9040/9140/9240 Series	DL7400 series	DL1700E series	DL1600 series
Item					
Features	Analog 4ch+Logic 32/16bits input Max. 5GS/s Serial bus analysis functions Power supply analysis functions "Virtual DA" functions Probe power connectors Supports USB Storage USB mouse/keyboard	Fast screen update & all points display Compact & lightweight, 4 ch Max. 10 GS/s I ² C, SPI, CAN and LIN bus analysis functions Probe power connectors Supports USB Storage USB mouse/keyboard Power supply analysis functions	Fast screen update & all points display High speed 8 ch + 16 bits logic input Max. 2 GS/s Web server function Serial bus analysis functions Power analysis functions USB mouse/keyboard Probe power connectors Supports USB Storage FlexRay Signal Analyzer	Fast screen update & all points display Compact & lightweight, 4 ch Max. 1 GS/s I ² C, SPI bus analysis functions Probe power connectors Supports USB Storage Web server functions USB mouse/keyboard	Fast screen update & all points display Compact 4 ch, 200 MS/s Max. 32 MW memory (4 ch) Web server functions Serial bus analysis functions (CAN, I ² C, SPI) USB mouse/keyboard Probe power connectors Supports USB Storage
Max. Sampling Rate	5GS/s	10 GS/s ^{(*)2}	2 GS/s	1 GS/s	200 MS/s
Bandwidth	1.0GHz ^{(*)2}	1.5 GHz ^{(*)2}	500 MHz	500 MHz ^{(*)2}	200 MHz
Number of analog input channels	4	4	DL7440/7480: 4 ch/8 ch	DL1720E/DL1735E, 40E, 40EL: 2 ch/4 ch	DL1620/1640/1640L: 2 ch/4 ch/4 ch
Logic Input	DL9705L, DL9710L: St'd:32 (8bits x 4) DL9505L, DL9510L: St'd:16 (8bits x 2)	—	St'd: 16-bit (8 bits x 2)	—	—
Max. vertical sensitivity (1:1)	2 mV/div	2 mV/div	2 mV/div	2 mV/div	2 mV/div
Vertical axis resolution	8 bit	8 bit	8 bit	8 bit	8 bit
Max. sweep sensitivity	500 ps/div	500 ps/div	1 ns/div	1 ns/div	2 ns/div
Max. record length	St'd: 6.25 MW	DL9040, DL9140, DL9240: 2.5 MW DL9040L, DL9140L, DL9240L: 6.25 MW	701450/70: 4 MW 701460/80: 16 MW	DL1740EL: 8 MW DL1740E: 2 MW DL1735E: 2 MW DL1720E: 1 MW	DL1620/DL1640: 8 MW DL1640L: 32 MW
Internal Media drive	St'd: PC card (2) selectable: —	PC card	PC card	—	—
Internal HDD	Optional: 40 GB (FAT32)	40 GB (FAT32)	FDD, Zip [®]	FDD, PC card	PC card, FDD, Zip [®]
Interface	St'd: USB Optional: Ethernet	USB Ethernet	USB/GP-IB Ethernet/SCSI	USB/GP-IB Ethernet	RS232 USB/Ethernet/GP-IB
Internal printer	St'd: — Optional: 112 mm width	Optional: 112 mm width	Optional: 112 mm width	Optional: 112 mm width	Optional: 112 mm width
Others	Optional: I ² C bus analysis SPI bus analysis CAN & LIN bus analysis Probe power connectors Power supply analysis functions User define math functions	I ² C bus analysis SPI bus analysis CAN & LIN bus analysis Probe power connectors Power Supply analysis functions User define math functions	I ² C bus analysis CAN bus analysis SPI bus analysis User-defined Math Power Analysis Four additional probe power (total: 8, DL7480 only) ^{(*)3} FlexRay bus analysis	I ² C bus analysis (SPI) 2/4 output Probe Power Connectors	I ² C bus Analysis (SPI) CAN bus Analysis (SPI) 2/4 Output Probe Power Connectors DC/Battery powered model (DC 12 V + Battery)
Display (TFT LCD)	8.4-inch color, XGA	8.4-inch color, XGA	8.4-inch color, VGA	6.4-inch color, VGA	6.4-inch color, VGA
External Dimensions W x H x D (mm)	350 x 200 x 285	350 x 200 x 178	373 x 210.5 x 355.3	220 x 266 x 264	220 x 266 x 224
Weight (kg)	Approx. 7.7	Approx. 6.5	Approx. 10	Approx. 5.5	Approx. 3.9

*1: See each product catalog for more detailed specifications
*2: Depends on model




*3: The DL7400 series comes standard with four probe power connectors.

DL Series Serial Bus Analyzer Selection Guide

Bus Types	Functions	Models				
		DL9700L/9500L Series	DL9040/9140/9240 Series	DL7400 Series	DL1700E Series	DL1600 Series
I ² C	Triggers	○	○	○	○	○
	Trigger Types	Address & data/Non-Ack/Every start/General Call/Start byte/HS mode	Address & data/Non-Ack/Every start/General Call/Start byte/HS mode	Start/Non-ACK/Address & Data	Start/Non-ACK/Address & Data	Start/Non-ACK/Address & Data
	Analysis & Search	○(*1)	○(*1)	○	○	○
CAN	Triggers	○	○	○	×	○
	Trigger Types	SOF/Error Frame/ID Std/Data, ID Ext/Data/ID/Data OR	SOF/Error Frame/ID Std/Data, ID Ext/Data/ID/Data OR	SOF/Identifier/RTR/Data Field/Error Frame	—	SOF/Identifier/RTR/Data Field/Error Frame
	Analysis & Search	○(*1)	○(*1)	○	×	○
LIN	Triggers	○	○	×	×	×
	Trigger Types	Synch Break				
	Analysis & Search	○(*1)	○(*1)	×	×	×
SPI	Triggers	○	○	○	○	×
	Trigger Types	3wire/4wire	3wire/4wire	A pattern, B pattern, A → B pattern, Byte count	—	—
	Analysis & Search	○(*1)	○(*1)	○	○	○
FlexRay	Triggers	×	×	○	×	×
	Trigger Types	—	—	Frame Start/Payload preamble, Null frame, Sync Frame, Startup Frame indicators/Frame ID/Cycle count (Payload) Data, CRC Error Trigger	—	—
	Analysis & Search	×	×	○	×	×

○ : Standards, ○ : Optional, × : NA
*1: Real-time Analysis and Display

- The ScopeCorder series can be used to capture single-shot or infrequently recurring signals. They can also execute computations on repetitive waveforms, and automatically extract waveform parameters. The ScopeCorder series offers an extensive selection with large-capacity memories, powerful triggering functions, and internal printers. It also can save and load data to and from internal or external media. DL750P and SL1400 can provide big paper output capability for many applications in the field.

Model	DL750	DL750P	SL1400
Item			
Features	Compact, 16 ch isolated inputs (8 module slots) GigaZoomEngine and Max 1 GW Dual Capture Eleven kinds of plug-in input modules Web server functions A6 (112 mm) printer Probe power connectors	Compact, 16 ch isolated inputs (8 module slots) GigaZoomEngine and Max 1 GW Dual Capture Eleven kinds of plug-in input modules Web server functions A4 (210 mm) Big Printer Probe power connectors	Compact, 16 ch isolated inputs (8 module slots) Eleven kinds of plug-in input modules Web server functions A4 (210 mm) Big Printer Probe power connectors
Max. sampling rate	10 MS/s ^{(*)2}	10 MS/s ^{(*)2}	10 MS/s ^{(*)2}
Bandwidth	3 MHz ^{(*)2}	3 MHz ^{(*)2}	3 MHz ^{(*)2}
Number of analog input channels	Plug-in module: 16 ch (isolation)	Plug-in module: 16 ch (isolation)	Plug-in module: 16 ch (isolation)
Logic input	St'd: 16 (8 bits × 2)	St'd: 16 (8 bits × 2)	St'd: 16 (8 bits × 2)
Max. vertical sensitivity (1:1)	100 μV/div ^{(*)2}	100 μV/div ^{(*)2}	1 mV range
Vertical axis resolution	Max. 16 bits ^{(*)2}	Max. 16 bits ^{(*)2}	Max. 16 bits ^{(*)2}
Max. sweep sensitivity	500 ns/div ^{(*)2}	500 ns/div ^{(*)2}	100 μs Setting
Max. record length	St'd 50 MW max/2.5 MW (16 ch)	50 MW max/2.5 MW (16 ch)	50 MW max/2.5 MW (16 ch)
	Optional 1 GW max/50 MW (16 ch)	1 GW max/50 MW (16 ch)	–
Internal media drive	selectable PC card, FDD and Zip	PC card, FDD	PC card
Internal HDD	Optional 40 GB (FAT32)	40 GB (FAT32)	40 GB (FAT32)
Interface	St'd USB/GP-IB/RS232/SCSI	USB/GP-IB/RS232/SCSI	USB/GP-IB/RS232/SCSI
	Optional Ethernet	Ethernet	Ethernet
Internal printer	St'd 112 mm width	210 mm width	210 mm width
Others	Optional DSP channels User-defined Math computations Probe Power Connectors DC 12 V model available	DSP channels User-defined Math computations Probe Power Connectors	Probe Power Connectors
Display (TFT LCD)	10.4-inch color, SVGA	10.4-inch color, SVGA	10.4-inch color, SVGA
External dimensions W × H × D (mm)	355 × 250 × 180	355 × 250 × 225	355 × 250 × 225
Weight (kg)	Approx. 6.6 ^{(*)3}	Approx. 8.0 ^{(*)3}	Approx. 8.0 ^{(*)3}

*1: See each product catalog for more detailed specifications

*2: Depends on input module

*3: Plug-in modules are not included

Input	Model No.	Sample Rate / Resolution	Channel Number	Isolation	Maximum Input Voltage	DC Accuracy	Features
Analog Voltage	701250	10MS/s, 12-bit	2	Isolated	600 V ^{*4} 250 V ^{*5}	± 0.5%	10 MS/s, 12 bit, broad bandwidth (3 MHz), high accuracy (0.5%), high noise immunity
	701251	1MS/s, 16-bit	2	Isolated	600 V ^{*4} 140 V ^{*5}	± 0.25%	1 MS/s, 16 bit, bandwidth: 300 kHz, high accuracy (0.25%) High sensitivity range (10 mV), low noise (±100 μVtyp), and high noise immunity
	701260	100kS/s, 16-bit	2	Isolated	1000 V ^{*4} 850 V ^{*5}	± 0.25%	High voltage (direct 850 V input), high accuracy (0.25%), with RMS, and high noise immunity
Temperature	701261/62	100kS/s (Voltage), 500S/s (Temperature)	2	Isolated	42 V	± 0.25% (Voltage)	Universal modules (voltage/temperature), voltage 100 kS/s, 16-bit, temperature 500 S/s Voltage (50 mV to 200 V range), thermocouple (K, E, J, T, L, U, N, R, S, B, W, iron-doped gold/chromel), with AAF (701262)
	701255	10MS/s, 12-bit	2	Non-isolated	600 V ^{*4*6} 250 V ^{*5}	± 0.5%	10 MS/s, 12-bit Non-Isolation (non-isolation version of model 701250)
Temperature	701265	500S/s, 16-bit	2	Isolated	42 V	± 0.08% (Voltage)	Both temperature and voltage input, frequency range of 100 Hz, thermocouple (K, E, J, T, L, U, N, R, S, B, W, iron-doped gold/chromel), High accuracy voltage (0.08%), high sensitivity range (1 mV), and low noise (±4μVtyp)
Acceleration	701275	100kS/s, 16-bit	2	Isolated	42 V	± 0.25% (Voltage) ± 0.5% (Acceleration)	Both acceleration and voltage input, built-in anti-aliasing filter Supports built-in amp type acceleration sensors (4 mA/22 V)
Strain	701270	100kS/s, 16-bit	2	Isolated	42 V	± 0.5% (Strain)	Supports strain NDIS, high accuracy (0.5%), 2, 5, 10 V built-in bridge power supply
	701271	100kS/s, 16-bit	2	Isolated	42 V	± 0.5% (Strain)	Supports strain DSUB, high accuracy (0.5%), 2, 5, 10 V built-in bridge power supply, and shunt CAL
Frequency	701280	25kS/s, 16-bit	2	Isolated	420 V ^{*4} 42 V ^{*5}	± 0.1% (Frequency)	Measurement frequency of 0.01 Hz to 200 kHz, Measured parameters (frequency, rpm, period, duty, power supply frequency, distance, speed)

*4, When using the 10:1 Isolation probe (700929). *5, When using the 1:1 safety adapter lead (701901). *6, When using the 10:1 passive probe (701940)

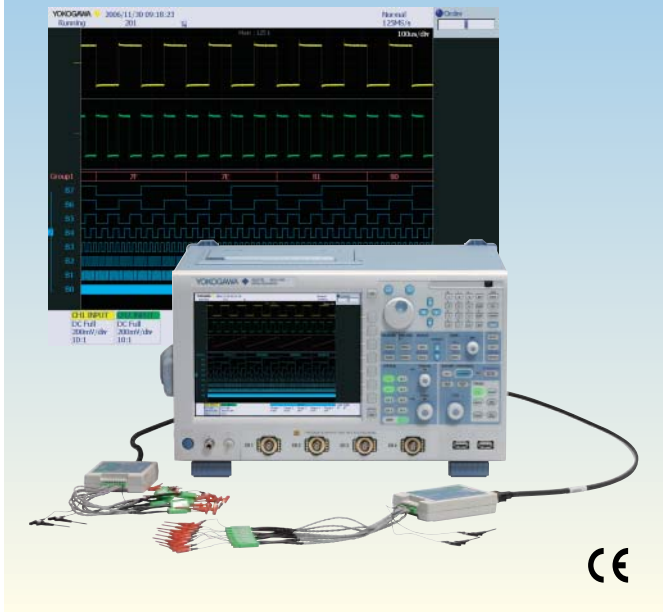
Mixed Signal Oscilloscopes

DL9000 Series MSO Models



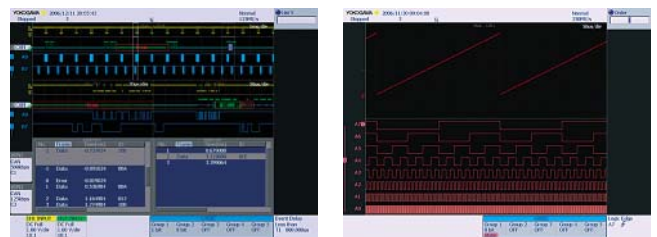
<http://www.yokogawa.com/tm/DL9710L/>

High performance and compact Mixed Signal Oscilloscope with 4 analog channels and 16/32-bit Logic input



Features

- Simultaneous measurement and analysis of 4 analog channels + 16/32-bit logic
- High speed acquisition and quick response
- Fast and powerful analysis of logic channels
- Capture and separate anomalies easily with History Memory
- Extensive trigger functions for handling the most complex waveforms
- Versatile zoom and search functions
- “Virtual D/A” Function
- Serial Bus Analysis (I²C, SPI, CAN, LIN) (optional)
- Power Supply Analysis (optional)



Basic Specifications

Analog inputs

Analog Bandwidth DC-1GHz(DL9710L, DL9510L)
DC-500MHz(DL9705L, DL9505L)

Analog input 4ch

Vertical sensitivity for 1MΩ input 2mV/div to 5V/div
for 50Ω input 2mV/div to 500mV/div

DC accuracy ±(1.5% of 8div + offset voltage accuracy)

Vertical axis resolution 8-bit

Logic inputs

Number of input 32bits(8bits × 4) (DL9710L, DL9705L)
16bits(8bits × 2) (DL9510L, DL9505L)

Maximum toggle frequency 250 MHz (701981)

Input voltage range ±10 V (DC + AC peak, 701981)

Logic Threshold level ±10 V (0.1 V setting resolution, 701981)

Input impedance approx. 10kΩ/approx. 9 pF (701981)

Common Specifications

Max. sampling rate 5GS/s

Sweep sensitivity 500ps/div to 50s/div

Max. record length 6.25MW

History memory Max data: 2000 (2.5 kW), when using history
1600 (2.5 kW), when in N single mode

Trigger modes Auto, Auto Level, Normal, Single, and N Single

Trigger types Edge/State, Width, Event Interval, TV, Serial Bus(I²C, SPI, CAN, LIN), Serial Pattern

Internal media drive Flash ROM, 90MByte

Interface USB Peripheral support, PC Card Interfaces, USB-PC Connection, Ethernet (optional)

Internal printer (optional) Thermal line-dot, width 112mm

Other options Serial Bus analysis (I²C, SPI, CAN, LIN), User-defined Math, Power supply analysis, Internal HDD, Probe Power supply

Display (TFT LCD) 8.4-inch color TFT LCD

External dimensions 350(W) × 200(H) × 285(D)mm

Weight Approx. 7.7kg (excluding printer)

Model	DL9710L	DL9705L	DL9510L	DL9505L
Analog inputs channels	4ch			
Analog Frequency Bandwidth	1GHz	500MHz	1GHz	500MHz
Logic inputs channels	32bits		16bits	
Max. Logic toggle frequency	250MHz			
Max. Sampling Speed	5GS(Simultaneous sampling of analog and logic)			

Model Number and Suffix Codes

Model	Suffix Code	Description
701320		DL9505L: 4ch 500MHz + Logic 16bits Max. 5 GS/s(2.5 GS/s/ch), 6.25 MW/ch
701321		DL9510L: 4ch 1GHz + Logic 16bits Max. 5 GS/s(2.5 GS/s/ch), 6.25 MW/ch
701330		DL9705L: 4ch 500MHz + Logic 32bits Max. 5 GS/s(2.5 GS/s/ch), 6.25 MW/ch
701331		DL9710L: 4ch 1GHz + Logic 32bits Max. 5 GS/s(2.5 GS/s/ch), 6.25 MW/ch
Power Cable	-D	UL/CSA standard
	-F	VDE standard
	-Q	BS standard
	-R	AS standard
	-H	GB standard
Help menu language	-HE	English Help
Logic Probe	-L0	No Logic Probe attached
	-L2	Attach two 250 MHz Logic Probes (701981)
	-L4 ¹	Attach four 250 MHz Logic Probes (701981)
Options	/B5	Built-in printer
	/P4 ²	4 Probe power connections on rear panel
	/C8 ³	Built-in HDD + Ethernet interface
	/C10 ³	Ethernet interface
	/G2 ⁴	User-defined math function
	/G4 ⁴	Power Supply Analysis Function
	/F5 ⁵	I ² C+SPI bus analyzer
	/F7 ⁵	CAN+LIN+SPI bus analyzer
/F8 ⁵	I ² C+CAN+LIN+SPI bus analyzer	

*1: Not available for DL9500 series

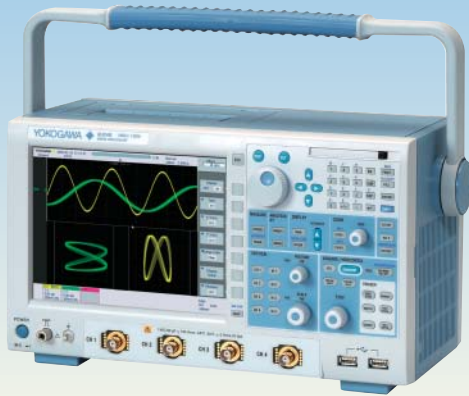
*2: Please order /P4 option if you use either current probes or differential probes such as 701920, 701922.

*3: Choose either one

*4: Choose either one

*5: Choose either one. I²C, CAN, LIN and SPI triggers are standard.

High-Performance 500 MHz/1 GHz/1.5 GHz Bandwidth Digital Oscilloscopes



DL9000



Basic Specifications

Max. sampling rate	5 GS/s (2 channels) 2.5 GS/s (4 channels) (DL9040/DL9040L/DL9140/DL9140L) 10 GS/s (2 channels) 5 GS/s (4 channels) (DL9240/DL9240L)
Bandwidth	500 MHz (DL9040/DL9040L) 1 GHz (DL9140/DL9140L) 1.5 GHz (DL9240/DL9240L)
Number of analog input channels	4 input channels
Vertical sensitivity	For 1 M Ω input: 2 mV/div to 5 V/div (steps of 1-2-5) For 50 Ω input: 2 mV/div to 500 mV/div (steps of 1-2-5)
DC accuracy	For 1 M Ω input: $\pm(1.5\%$ of 8 div + offset voltage accuracy) For 50 Ω input: $\pm(1.5\%$ of 8 div + offset voltage accuracy)
Vertical axis resolution	8-bit (25 LSB/div)
Sweep sensitivity	500 ps/div to 50 s/div (steps of 1-2-5)
Max. record length	2.5 M word/channel (DL9040/DL9140/DL9240) 6.25 M word/channel (DL9040L/DL9140L/DL9240L)
Internal media drive	Flash ROM, Capacity 90 MB
Interface	USB Peripheral Support/PC Card Interfaces/ USB-PC Connections/Ethernet Communication (/C10 and /C8 Options)
Internal printer	Thermal line-dot, Paper width 112 mm (option)
Other options	I ² C Analysis Function, SPI Analysis Function, CAN Analysis Function, LIN Analysis Function, Internal Hard Disk Drive, User-defined math function, Power supply analysis function
Display (TFT LCD)	8.4-inch (21.3 cm) color TFT liquid crystal display
External dimensions	350 (W) \times 200 (H) \times 178 (D) mm (when printer cover is closed, excluding handle and protrusions)
Weight (kg)	Approx. 6.5 kg

Overview

The DL9000 signalXplorer is Yokogawa's 10(X)th generation digital oscilloscope. It allows users to select the most appropriate memory setting for a given measurement and then acquires and displays long and short memory records quickly, saving the waveforms to its segmented memory.

Advanced memory handling ensures that you get all the benefits of a long memory scope regardless of the record size you allocate for each acquisition. This is made possible by the state-of-the-art ADSE (advanced data stream engine) ASIC.

Features

- 4 input channels
- Analog BW
500 MHz (DL9040/DL9040L)
1 GHz (DL9140/DL9140L)
1.5 GHz (DL9240/DL9240L)
- Max. sampling rate
5 GS/s (2 channels) 2.5 GS/s (4 channels) (DL9040/DL9040L/DL9140/DL9140L)
10 GS/s (2 channels) 5 GS/s (4 channels) (DL9240/DL9240L)
- Max. record length
2.5 M word/channel (DL9040/DL9140/DL9240)
6.25 M word/channel (DL9040L/DL9140L/DL9240L)
- Fast acquisition rate
Max. 2.5 M waveforms/sec/ch
- History memory function
Review & analyze up to 2,000 of the most recent waveforms after the acquisition is stopped
- Compact and light weight
18 cm (7.1") depth, 6.5 kg (14.5 lbs.)

Model Number and Suffix Codes

Model and Suffix Codes of DL9040/9140/9240

Model	Suffix Code	Description
701307		DL9040 digital oscilloscope 500 MHz max. 5 GS/s (2.5 GS/s/ch), 2.5 Mword/ch
701308		DL9040L digital oscilloscope 500 MHz max. 5 GS/s (2.5 GS/s/ch), 6.25 Mword/ch
701310		DL9140 digital oscilloscope 1 GHz max. 5 GS/s (2.5 GS/s/ch), 2.5 Mword/ch
701311		DL9140L digital oscilloscope 1 GHz max. 5 GS/s (2.5 GS/s/ch), 6.25 Mword/ch
701312		DL9240 digital oscilloscope 1.5 GHz max. 10 GS/s (5 GS/s/ch), 2.5 Mword/ch
701313		DL9240L digital oscilloscope 1.5 GHz max. 10 GS/s (5 GS/s/ch), 6.25 Mword/ch
Power cable	-D	UL/CSA standard
	-F	VDE standard
	-Q	BS standard
	-R	AS standard
	-H	GB standard
Help menu language	-HE	English Help
	-HC	Chinese Help
	-HK	Korean Help
Options	/BS	Built-in printer
	/P2 ¹	Probe power connections on rear panel (2 outputs for 900 MHz FET probe and current probe)
	/CB ²	Built-in hard disk + Ethernet interface
	/C10 ²	Ethernet interface
	/G2 ²	User-defined math
	/G4 ²	Power supply analysis (included user-defined math)
	/FS ³	I ² C + SPI bus analyzer
	/F7 ³	CAN + LIN + SPI bus analyzer
/F8 ³	I ² C + CAN + LIN + SPI bus analyzer	

1: Please specify this /P2 option if you use either current probes or differential probes such as 701920 or 701922.

2: Choose either one.

3: Choose either one. I²C, CAN, LIN and SPI bus signal triggers are standard.

Digital Oscilloscopes

DL7440/DL7480

Signal Explorer

<http://www.yokogawa.com/tm/DL7400/>

The DL7400 Series Allows Multi-channel Capture of Analog and Logic Signals



DL7440



DL7480



Basic Specifications

Input channels	4/8 analog (depends on model), and 16-bit logic
Voltage axis sensitivity setting range	For 1 M Ω input: 2 mV/div to 10 V/div (steps of 1, 2, or 5) For 50 Ω input: 2 mV/div to 1 V/div (steps of 1, 2, or 5)
Frequency characteristics	For 1 M Ω input: (using passive probe model 700988; specified at probe tip) 10 V/div to 10 mV/div: DC to 400 MHz (500 MHz*) *: When using Miniature passive probe model 701941; specified at probe tip.
A/D conversion resolution	8 bits (24 LSB/div)
Maximum sampling rate	2 GS/s
Maximum record length	701450/701470: 4 MW/channel 701460/701480: 16 MW/channel
DC accuracy	$\pm(1.5\%$ of 8 div + offset voltage accuracy)
Time axis setting range	1 ns/div to 50 s/div (for record length of 10 kW or greater)
Display	8.4-inch color TFT liquid crystal display
Built-in printer (optional)	Paper width: 112 mm
Interfaces	GP-IB, USB-PC connector, USB peripheral connector, Ethernet (100BASE-TX, 10BASE-T; optional), SCSI (optional)
Other options	I ² C bus analysis functions, CAN Bus Signal Analysis Function, SPI Bus Signal Analysis Function, Power Analysis Functions, FlexRay Signal Analyzer
External dimensions	373 (W) \times 210.5 (H) \times 355.3 (D) mm (when the printer cover is closed; does not include knobs and protrusions)
Weight	Approx. 10 kg (24.2 lbs, including printer; does not include logic inputs)

Overview

The DL7400 Series includes 4 and 8-channel analog input models. Each model has up to 16-bit logic inputs. All these inputs come in a convenient, benchtop-sized instrument. In addition to capturing up to 16 logic signals, the DL7400 Series lets you simultaneously measure up to 8 analog signals without needing to synchronize two separate oscilloscopes.

Features

- 4 or 8 analog channels and 16-bit logic input
- Maximum 16 MW recording memory
- USB compliant, USB mass storage supported
- Ethernet connectivity (optional)
- User-defined math (optional)
- 2 GS/s maximum speed
- 500 MHz analog bandwidth
- Supports 250 MHz logic probe
- PC card interface (Type II)
- Power supply analysis function (optional)
- Serial bus analysis function (optional)
- FlexRay signal analyzer (optional)

Model Number and Suffix Codes

Model	Suffix Code	Description
701450		DL7440 with 4 CH input and maximum 4 MW memory
701460		DL7440 with 4 CH input and maximum 16 MW memory
701470		DL7480 with 8 CH input and maximum 4 MW memory
701480		DL7480 with 8 CH input and maximum 16 MW memory
Power cable	-D	UL/CSA standard
	-F	VDE standard
	-Q	BS standard
	-R	AS standard
	-H	GB standard
Internal storage drive	-J1	Floppy disk drive ¹
	-J2	Zip [®] drive ¹
Options	/B5	built-in printer
	/E4	Four additional passive probes(701470, 701480 only) ²
	/EX4	Attach four 701941 probes ^{7,9}
	/EA4	Add four 701941 probes ^{8,9}
	/P4	Four additional probe power connectors(701470, 701480 only) ³
	/N3	Logic input for 701450/701470 ⁴ (Standard option)
	/N4	Logic input for 701460/701480 ⁴ (Standard option)
	/C7	SCSI interface
	/C10	Ethernet interface
/G2	User-defined math function ⁵	
/G4	Power Supply Analysis Function ⁵	
/F5	I ² C + SPI Bus Analyzer ⁶	
/F7	CAN + SPI Bus Analyzer ⁶	
/F8	I ² C + CAN + SPI Bus Analyzer ⁶	
/F9	FlexRay Signal Analyzer	

1: Select one only.

2: The DL7400 Series is equipped with four passive probes (700988) as standard.

3: The DL7400 Series is equipped with four probe power connectors as standard.

4: Select /N3 for models 701450 and 701470, and /N4 for models 701460 and 701480. Logic probes are sold separately. These options can be installed free of charge.

5: /G2 and /G4 cannot be ordered together. /G4 includes /G2

6: Option /F5, /F7, and /F8 cannot be specified together. Select one only.

The SPI Bus Analysis and Search functions are standard feature. The SPI Bus Triggers are only available as an option.

7: Four 700988 probes are not included when this option is specified.

8: This option can be specified with model 701470, 701480 only.

9: When the option /E4 is specified, neither /EX4 nor /EA4 can be specified together.

These Compact, Lightweight Models Offer High-speed Sampling and Long Memory



DL1740EL



DL1740E



DL1735E



DL1720E

Basic Specifications

Input channels	4 (701725, 701730, 701740) 2 (701715)
Voltage axis sensitivity setting range	For 1 M Ω input: 2 mV/div to 10 V/div (steps of 1, 2, or 5) For 50 Ω input: 2 mV/div to 1 V/div (steps of 1, 2, or 5)
Frequency characteristics	For 1 M Ω input (using passive probe model 700988; specified at probe tip): 10 V/div to 10 mV/div: DC to 400 MHz (500 MHz*), (DC to 350 MHz, 701725) *: When using Miniature passive probe model 701941; specified at probe tip.
A/D conversion resolution	8 bits (24 LSB/div)
Maximum sampling rate	1 GS/s
Maximum record length	701715: 1 MW/CH 701725, 701730: 2 MW/CH 701740: 8 MW/CH
DC accuracy	$\pm(1.5\%$ of 8 div + offset voltage accuracy)
Time axis setting range	1 ns/div to 50 s/div (for record length of 10 kW or greater)
Display	6.4-inch color TFT liquid crystal display
Built-in printer (optional)	Paper width: 112 mm
Computer interface	GP-IB, USB-PC connector (USB Rev 1.1 compliant), Ethernet (100BASE-TX/10BASE-T compliant, optional)
Other options:	I ² C + SPI bus analysis function, probe power
External dimensions	220 (W) \times 265.8 (H) \times 264.1 (D) mm
Weight	Approx. 5.5 kg (with all options)

Overview

This series has an A4 sized footprint, is compact, and space-saving and with 350 MHz or 500 MHz bandwidth and Max. 8 MW memory.

Features

- Maximum sampling rate
 - 1 GS/s: Real-time sampling
 - 100 GS/s: Repetitive sampling
- 500MHz analog bandwidth (DL1735E : 350 MHz)
- Maximum record length
 - DL1740EL: 8 Mwords
 - DL1740E, DL1735E: 2 Mwords
 - DL1720E: 1 Mwords
- HDTV trigger
- I²C and SPI bus trigger and analysis (optional)
- USB storage and USB peripherals
 - Supports USB memory devices (flash memory, hard disk drive, MO drive, etc.)
 - Supports a USB mouse, keyboard, or printer
- Ethernet function (optional)
 - Web server, FTP server, and network printing
- PC card interface (Type II)
 - (or select floppy disk for removable media type)
- Built-In printer (optional)

Model Number and Suffix Codes

Model	Suffix Code	Description
701715		DL1720E digital oscilloscope with 2 ch input, 500 MHz analog bandwidth and maximum 1 MW memory
701725		DL1735E digital oscilloscope with 4 ch input, 350 MHz analog bandwidth and maximum 2 MW memory
701730		DL1740E digital oscilloscope with 4 ch input, 500 MHz analog bandwidth and maximum 2 MW memory
701740		DL1740EL digital oscilloscope with 4 ch input, 500 MHz analog bandwidth and maximum 8 MW memory
Power cable	-D	UL and CSA standard
	-F	VDE standard
	-Q	BS standard
	-R	AS standard
	-H	GB standard
Internal storage drive	-J1	Floppy disk drive ¹
	-J3	PC card interface (type II) ¹
Options	/B5	Built-in printer
	/P2	Probe power for model 701715 ²
	/P4	Probe power for models 701725, 701730 and 701740 ²
	/C10	Ethernet interface
	/F5	I ² C + SPI bus analysis function ³
	/EX2	Attach two 701941 probes ⁴
/EX4	Attach four 701941 probes ⁵	

The instrument comes standard with passive probes (700988). Four probes are included with the 701725, 701730 and 701740, and two probes are included with the 701715.

1. One or the other must be selected.

2. Select /P2 for model 701715, or /P4 for models 701725, 701730 and 701740.

3. Option for models 701725, 701730 and 701740 only.

4. Option for model 701715 only. The 700988 probes are not included when this option is specified.

5. Option for models 701725, 701730, 701740 only. The 700988 probes are not included when this option is specified.

Our Best-selling Models Support 3-mode Power Supplies and Weights just 3.9 kg



DL1640/DL1640L



DL1620



DC power model + battery box

Basic Specifications

Input channels	4 (701610, 701620) 2 (701605)
Sensitivity	2 mV/div to 10 V/div (in steps of 1, 2, or 5)
DC accuracy	10 mV/div to 10 V/div: 1.5% of 8 div + offset voltage accuracy
Frequency characteristics	10 mV/div to 10 V/div: DC to 200 MHz
Vertical resolution	8 bits (24 LSB/div)
Maximum sampling rate	200 MS/s
Maximum record length	701605, 701610: 8 MW/ch 701620: 32 MW/ch
Sweep time	2 ns/div to 800 s/div (varies depends on memory length)
Display	6.4-inch TFT color liquid crystal display
Built-in printer (optional)	112 mm paper width
Communication interfaces	Serial port (RS232), USB port (optional), USB-PC port (optional), GP-IB port (optional ¹), Ethernet port (complies with 100BASE-TX and 10BASE-T; optional)
Internal media drive	Floppy drive, Zip [®] drive, PC card drive
Other options	Built-in printer, Probe power, GP-IB + USB, Ethernet + USB, I ² C bus signal analysis function, CAN bus signal analysis function.
External dimensions	220 (W) × 266 (H) × 224 (D) mm
Weight	Approx. 4.5 kg (10.8 lbs; with all options) Approx. 3.9 kg (8.6 lbs; without any options)

Overview

With a three-mode power supply (AC, 12 VDC and battery) the DL1600 goes everywhere you need to make measurements. It also has serial bus (I²C, SPI, CAN), signal capturing, and protocol analysis functions.

Features

- CAN Bus signal analysis function (optional)
- DC Power model + Battery box
- I²C Bus analysis function (optional)
- 4 channels 200 MS/s (DL1640/DL1640L)
- 2 channels 200 MS/s (DL1620)
- 200 MHz analog bandwidth
- Maximum memory length: 32 MW (DL1640L) and 8 MW (DL1640/DL1620)
- 6.4-inch wide-angle-view TFT color liquid crystal display
- Compact and lightweight (approx. 3.9 kg 10.8 lbs)
- A4 size or smaller footprint
- Internal storage media (select PC card, Zip[®] drive, or Floppy drive)
- USB compliant, USB storage Supported (optional)
- Ethernet connectivity (optional)
- Real-time digital filtering

Model Number and Suffix Codes

Model/Options	Suffix code	Description
701605		DL1620 digital oscilloscope
701610		DL1640 digital oscilloscope
701620		DL1640L digital oscilloscope
	-AC	100–120 V & 220–240 V
	-DC ¹	12 VDC
Power cable	-D	UL/CSA standard
	-F	VDE standard
	-Q	BS standard
	-R	AS standard
	-H	GB standard
	-Y	No power cable
Internal media drive	-J1	Floppy drive ²
	-J2	Zip [®] drive ²
	-J3	PC card drive (Type II) ²
Other options	/B5	Built-in printer
	/P2	Probe power for 701605
	/P4	Probe power for 701610 and 701620
	/C1	GP-IB + USB ³
	/C10	Ethernet + USB ³
	/F5	I ² C bus signal analysis function ⁴
	/F7	CAN bus signal analysis function ⁵

The main unit comes standard with four passive probes (700960) for 701610/701620 and two passive probes for 701605.

¹ Select "-Y" for the DC power model.

² Choose one.

³ Choose one.

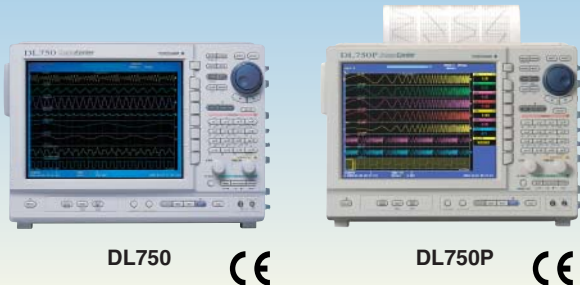
⁴ The I²C bus analysis function includes the SPI analysis function. I²C only be specified for model 701610 and 701620.

⁵ The CAN bus analysis function includes the SPI bus analysis function. It can only be specified for model 701610 and 701620.

Model/Options	Suffix code	Description
701680 ⁶		Battery box and charger
Power cable	-D	UL/CSA standard
	-F	VDE standard
	-Q	BS standard
	-R	AS standard
	-H	GB standard

⁶ The Battery box comes standard with the cable for connecting to the main unit.

Innovative Solutions for Long-Term Recording to both Memory and Paper



DL750



DL750P



Basic Specifications

Input Type	Isolated plug-in module
Slots	8 (16 channels)
Logic inputs	16 (8 bits × 2)
Sweep time	500 ns to 3 days/div (10 div)
Display	10.4-inch color TFT liquid crystal display
Built-in printer	
Printing method	Thermal line-dot printing
Paper width	112 mm (DL750) 210 mm (Effective print width 200mm) (DL750P)
Communication interfaces	GP-IB, USB peripheral equipment jacks (USB keyboards and USB printers), USB (complies with Rev. 1.1, for connection to PC), Ethernet (complies with 100BASE-TX and 10BASE-T; with /C10 option), serial (RS232), and SCSI
Internal media drives	Floppy drive, Zip® drive (DL750), or PC card (choose one), and 40 GB hard drive (with /C8 option)
External dimensions	355 (W) × 250 (H) × 180 (D) mm (DL750) 355 (W) × 250 (H) × 225 (D) mm (DL750P)
Weight	Approx. 6.6 kg (DL750), 8.0 kg (DL750P), (main unit with full options, including M3, C8, C10, and P4) Approx. 9 kg (DL750), 10.3 kg (DL750P), (main unit and eight 701250 modules)

1 GW Memory for full-length display and instantaneous zooming (to user-specified size)

Sample Rate	Maximum Recording Time			
	Seconds	Minutes	Hours	Days
10 MS/s	100 seconds	1.67	0.028	0.001
1 MS/s	600	10 minutes	0.167	0.007
100 kS/s	9000	150 minutes	2.5 hours	0.10
10 kS/s	72000	1200	20 hours	0.83 day
1 kS/s	864000	14400	240.0	10 days
200 S/s	2592000	43200	720.0	30 days

Overview

ScopeCorder is a new measurement tool combining the functions of an oscilloscope for capturing instantaneous phenomena and a data recorder for monitoring long-term trends

Features

- Standard high resolution A4 thermal printer (DL750P)
- Effective print width is 200 mm (1600-dot resolution) (DL750P)
- Compact body and isolated 16 analog channels, 8 slots and 16-bits logic input.
- Eleven kind of plug-in modules offers high accuracy and low noise measurement and also offer various measurement (Voltage/Current/Temperature/Strain/Vibration/Frequency)
- 1 GW large memory and 30 days observation.
- 1 GW instantaneous display (GigaZoom Function)
- Simultaneous high-speed and low-speed recording using Dual Capture
- Cycle statistical calculation
- Many Ethernet functions (Web server/FTP server/Email)
- Various communication interfaces (USB/Ethernet/GPIB/RS232/SCSI)
- PC card drive available
- 40GB internal hard drive

Model Number and Suffix Codes

Model	Suffix Code	Description
701210		"DL750 main unit (16 isolated channels, 8 slots + 16-bit logic)" 112 mm width A6 thermal printer built-in"
701230		"DL750P main unit (16 isolated channels, 8 slots + 16-bit logic)" 210 mm width A4 thermal printer built-in"
Power cable	-D	UL/CSA standard
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard (Complied with CCC)
Internal media drive ²	-J1	Floppy drive
	-J2	Zip® drive (available for the DL750 only) ³
	-J3	PC card drive
Default Help language	-HE	English
	-HJ	Japanese
	-HC	Chinese
	-HG	German
	-HF	French
	-HL	Italian
	-HK	Korean
Memory expansion	/M1	Memory expansion to 10 MW/CH ⁴
	/M2	Memory expansion to 25 MW/CH ⁴
	/M3	Memory expansion to 50 MW/CH ⁴
Other specifications	/C8	Internal 40 GB hard drive (FAT32)
	/C10	Ethernet interface
	/G2	User-defined math function
	/G3	DSP channel function
	/P4	Probe power (4-output)
/DC	DC 12V Power (10-18VDC) ³	

1. Plug-in modules are not included.

2. Choose only one.

3. Zip drive and DC12V power supply cannot be specified together with the DL750P.

4. Cannot be specified together.

ScopeCorder LITE

SL1400



<http://www.yokogawa.com/tm/SL1400/>

Easily & Quickly Saves Data to Memory and Paper



SL1400



Overview

A plug-in module type chart recorder with a large built-in A4 sized high-resolution thermal printer

Features

- Easy-to-operate
- Standard high resolution A4 size thermal printer
- Effective print width is 200 mm (1600-dot resolution)
- Compact body and isolated 16 analog channels, 8 slots and 16-bits logic input
- Eleven kinds of plug-in modules offers high accuracy and low noise measurement and also offer various measurement, Voltage/ Current/Temperature/Strain/Vibration/Frequency
- 50MW large memory and 30 days observation
- Cycle statistical calculation
- Many Ethernet functions (Web server/FTP server/E-mail)
- Various communication interface USB/Ethernet/GP-IB/RS-232/ SCSI
- PC card drive is available
- 40 GB internal hard drive
- USB storage function is available

Basic Specifications

Input	
Type	Isolated plug-in module
Slots	8 (16 channels)
Logic inputs	16 (8 bits × 2)
Sweep time	100 us to 30 days
Display	10.4-inch color TFT liquid crystal display
Built-in printer	
Printing method	Thermal line-dot printing
Paper width	210 mm (Effective print width 200 mm)
Communication interface	GP-IB, USB peripheral equipment jacks (USB keyboards and USB printers), USB (compiles with Rev. 1.1, for connection to PC), Ethernet (complies with 100 BASE-TX and 10 BASE-T; with /C10 option), serial (RS232), and SCSI
Internal media drives	PC card or Drive less (choose one), and 40GB hard drive (with /C8 option)
External dimensions	355(W) × 250(H) × 225(D) mm
Weight	Approx. 8.0 kg (main unit with full options, including C8, C10 and P4) Approx. 10.3 kg (main unit and eight 701250 modules)

Model Number and Suffix Codes

Model	Suffix Code	Description
701240		SL1400 main unit (16 isolated Channels, 8 slots + 16-bit logic) ¹ 210 mm width A4 thermal printer built-in
Power cable ²	-D	UL/ CSA standard
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard (Complied with CCC)
Internal media drive ²	-J0	non Drive
	-J3	PC card drive
Language ²	-HE	English, Panel in English
	-HJ	Japanese, Panel in Japanese
	-HC	Chinese, Panel in English
	-HG	German, Panel in English
	-HF	French, Panel in English
	-HL	Italian, Panel in English
	-HK	Korean, Panel in English
-HS	Spanish, Panel in English	
Other specifications	/C8	Internal 40 GB hard drive (FAT32)
	/C10	Ethernet option
	/P4	Probe power (4-output)

1. Plug-in modules are not included.
2. Choose only one.

Module Selection



* Above plug-in modules can be used among all ScopeCorder series.

Plug-in Module Model Numbers

Model	Description
701250	High-speed 10 MS/s 12-bit Isolation module (2 CH)
701251	High-speed 1 MS/s 16-bit Isolation module (2 CH)
701255	High-speed 10 MS/s 12-bit non-Isolation module (2 CH)
701260	High-voltage 100 kS/s 16-bit Isolation module (2 CH, with RMS)
701261	Universal module (2 CH)
701262	Universal module (with anti-aliasing filter, 2 CH)
701265	Temperature/high-precision voltage module (2 CH)
701270	Strain module (NDIS, 2 CH)
701271	Strain module (DSUB, Shunt-CAL, 2 CH)
701275	Accelaration module (with anti-aliasing filter, 2 CH)
701280	Frequency module (2 CH)

■ Probes not included with any modules.

DL9240/DL9240L
Accessory

USB 2.0 Compliance Test Solution busXplorer™-USB

<http://www.yokogawa.com/tm/busXplorer-USB/>



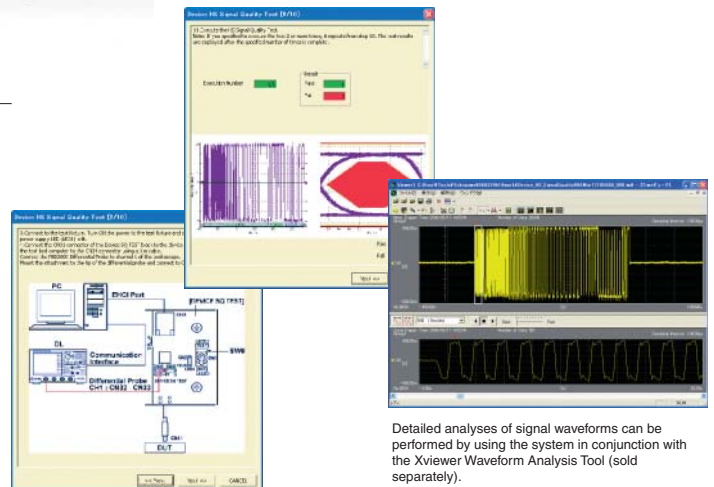
The USB 2.0 compliance test solution^{*1} busXplorer™-USB takes advantage of the wide variety of DL9000 trigger and analysis functions to offer a system for carrying out highly automated USB compliance tests. In addition to facilitating execution of the various tests from a PC via Ethernet, the newly developed test software displays detailed test procedures including the wiring method. This allows even inexperienced operators to easily perform the tests.

*1) busXplorer™-USB comprises a test fixture and test software.

USB 2.0 Compliance Test Solution Equipments

- 701312/701313 DL9240/DL9240L
- 701985 USB Compliance Test Fixture & Software
- 701923 PBD2000 2GHz BW differential probe
- 701913 PBA2000 2.5GHz BW active probe
- 701933 50MHz BW current probe

*The equipment that is required varies depending on the test. Please contact us for details.



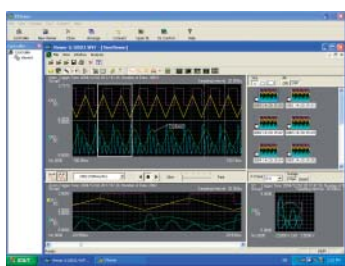
Detailed analyses of signal waveforms can be performed by using the system in conjunction with the Xviewer Waveform Analysis Tool (sold separately).

DL Series Accessories
Software

X viewer/MATLAB tool kit

<http://www.yokogawa.com/tm/product/tm-product.htm>

View Waveform Data on Your PC



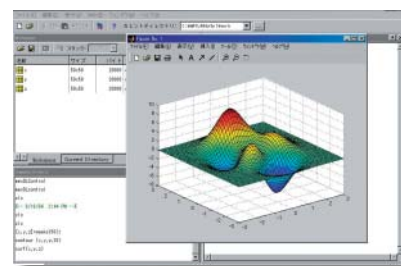
701992

Xviewer

Xviewer is a PC software application designed to work with Yokogawa's DL Series and the DL750 Series ScopeCorders. Xviewer allows you to display DL-acquired waveform data (using the "Viewer" function), perform file transfers, and control DL Series from a PC.

You can download a trial version of Xviewer from Yokogawa's web site at: <http://www.yokogawa.com/tm/701992/>

Plug-in for MATLAB software



701991

MATLAB tool kit

The MATLAB tool kit for the DL Series is a plug-in for MATALAB software. The toolkit can be used to control supported instruments using MATLAB or to acquire data from the instruments to use in MATLAB via a communication interface (GP-IB, USB, Ethernet).

You can download a trial version of MATLAB tool kit from Yokogawa's web site at: <http://www.yokogawa.com/tm/701991/>

In addition to the above, various kinds of accessory software, free software, LabVIEW drivers, and LabWindows/CVI drivers, can be downloaded from the following web site. <http://www.yokogawa.com/tm/tm-softdownload.htm>

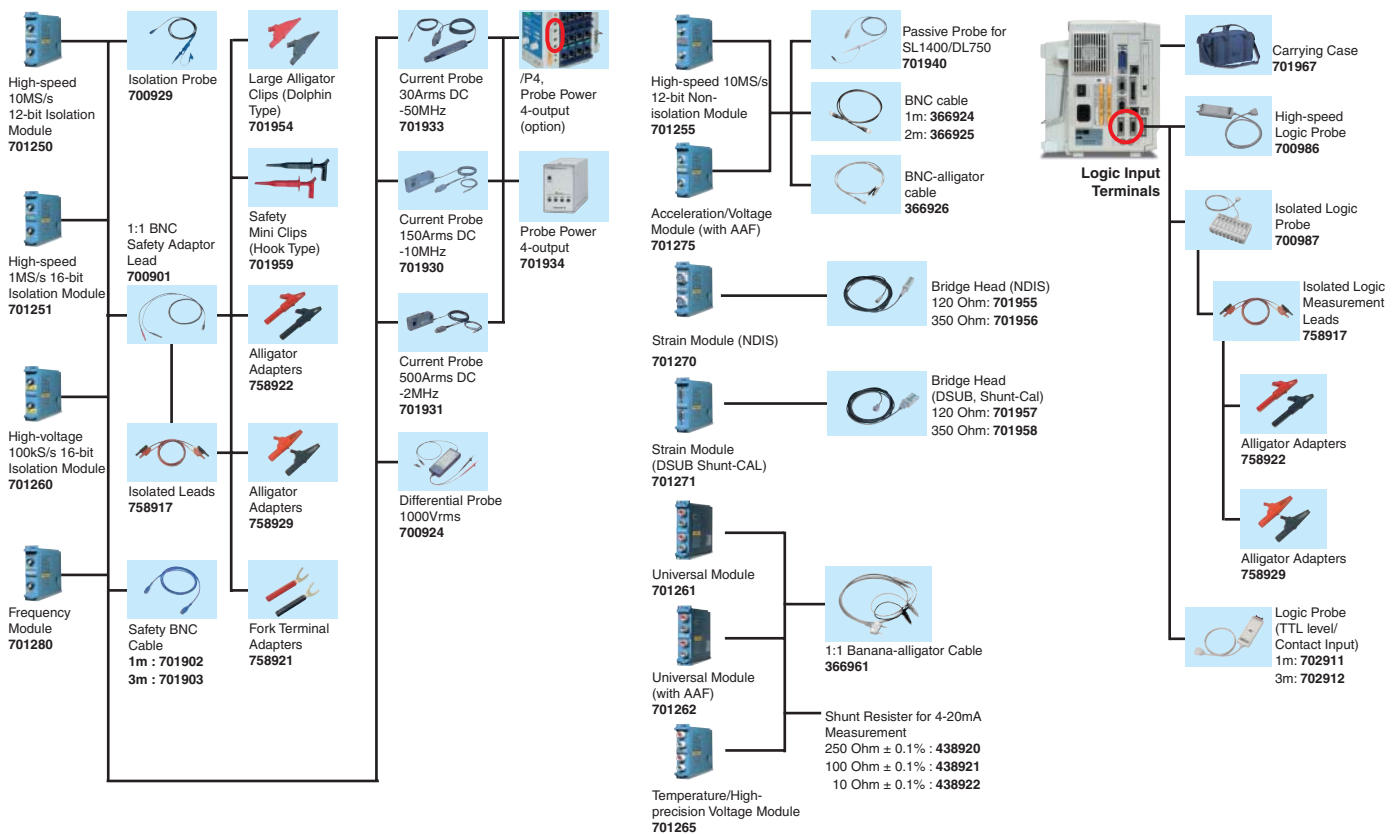
Waveform Measuring DL Series Accessories List

Product	Part No.	Description		DL9700	DL9800	DL7400	DL1600	DL1700E
PB500 (500 MHz passive probe)	701943	500 MHz BW, 10:1, 1.5 meters		●	●			
PBA2500 (2.5 GHz active probe)	701913	2.5 GHz BW, 10:1, 1.2 meters		●	●			
PBA1500 (1.5 GHz active probe)	701914	1.5 GHz BW, 10:1, 1.2 meters		●	●			
PBA1000 (1.0 GHz active probe)	701912	1.0 GHz BW, 10:1, 1.2 meters		●	●			
PBD 2000 (2 GHz differential probe)	701923	2 GHz BW, 10:1, Max. differential input voltage: ±5 V, 1.2 meters		●	●			
PBL5000 (5 GHz low capacitance probe)	701974	5 GHz BW, 10:1, 20:1, 0.95 meters		●	●			
400 MHz passive probe	700988	400 MHz BW (10:1) Allows the division ratio to be switched between 10:1 and 1:1. 1.5meters				●		●
200 MHz passive probe	700960	200 MHz BW (10:1) Allows the division ratio to be switched between 10:1 and 1:1. 1.5meters					●	
500 MHz Miniature passive probe	701941	DC to 500 MHz, 10:1, 1.2 meters				●		●
350 MHz Miniature passive probe	701942	DC to 350 MHz, 10:1, 3.0 meters				●		●
100:1 High voltage probe	701944	400 MHz BW, 100:1, 1.2 meters		●	●	●	●	●
100:1 High voltage probe	701945	250 MHz BW, 100:1, 3.0 meters		●	●	●	●	●
900 MHz FET Probe	700939	DC to 900 MHz, Input impedance 1.8 pF		●	●	●	●	●
Logic probe	701980	Input impedance: 1 MΩ Max. toggle frequency: 100 MHz		●	●			
Logic probe	701981	Input impedance: 10 KΩ Max. toggle frequency: 250 MHz		●	●			
100 MHz differential probe	701921	DC~100 MHz, 10:1, 100:1, Max. differential input voltage: ±70 V (10:1), ±700 V (100:1)		●	●	●	●	●
200 MHz differential probe	701922	DC~200 MHz, 10:1, Max. differential input voltage: ±20 V		●	●	●	●	●
15 MHz differential probe	700925	DC~15 MHz, 10:1, 100:1, Max. differential input voltage: ±500 V (100:1), ±50 V (10:1)		●	●	●	●	●
100 MHz differential probe	700924	DC~100 MHz, 100:1, 1000:1, Max. differential input voltage: ±1400 V (1000:1), ±350 V (100:1)		●	●	●	●	●
500 MHz differential probe	701920	DC~500 MHz, 10:1, Max. differential input voltage: ±12 V		●	●	●	●	●
Deskew signal source	701935	Output voltage: Approx. 0-5 V Output current: Approx. -100 to 0 mA		●	●	●		
Current probe	701933	DC to 50 MHz 30 Arms		●	●	●	●	●
Current probe	701930	DC to 10 MHz 150 Arms				●	●	●
Current probe	701931	DC to 2 MHz, 500 Arms				●	●	●
Current probe	701932	DC to 100 MHz, 30 Arms		●	●	●	●	●
Probe power supply	701934	Large current output, external probe power supply (4 outputs)		●	●	●	●	●
50 Ω terminator	700976	Used to connect an oscilloscope having a 1 MΩ input to an instrument having a 50 Ω output.					●	
Probe stand	701919	Diameter of attachable probe : ø8 to 13mm Weight : Approx. 1.5 kg		●	●	●	●	●

Waveform Measuring **ScopeCorder Series Accessories List**

Product	Part No.	Description		
15 MHz band differential probe	700925	A probe designed for digital oscilloscopes to transform its single-ended input to a differential input. ±500 V (DC + AC peak)		
100 MHz band differential probe	700924	A probe lets you make wide-band differential input measurements. Just connect the probe to the input of a single-end input digital oscilloscope. ±1400 V (DC + AC peak) or 1000 Vrms		
Current probe 30 Arms	701933	Bandwidth DC up to 50 MHz. Can be directly connected to an oscilloscope with 1 MΩ input impedance.		
Current probe 150 Arms	701930	Bandwidth DC up to 10 MHz. Can be directly connected to an oscilloscope with 1 MΩ input impedance.		
Current probe 500 Arms	701931	DC to 2 MHz, 500 Arms		
Current probe 30 Arms	701932	DC to 100 MHz bandwidth, 30 Arms		
Probe power supply	701934	Large current output, external probe power supply (4 outputs)		
Isolation probe	700929	A 10:1 probe designed for use with isolated modules		
1:1 BNC safety adapter lead (with combination with followings)	701901	1000 Vrms-CAT II for 701250, 701251, 701260 (10:1)		
	Safety mini clip (hook type)	701959	1000 Vrms-CAT II (2 per set)	
	Large alligator clip (dolphin type)	701954	1000 Vrms-CAT II (2 per set)	
Passive probe for DL750/SL1400 (10:1)	701940	Non-isolated 600 Vpk (701255) 42 V or less (others)		
BNC cable	366926	A 1 m long BNC-alligator clip cable.		





Accessories Combinations




Power Measuring Instruments

Yokogawa's WT Series Power Meters and PZ4000 Power Analyzer:
Advanced Technology and High Reliability for a Wide Range of Power Measurement Solutions

WT Series

Models	WT3000	WT2000	WT1600	WT210/WT230
Items				
Features	With basic power accuracy of $\pm 0.02\%$ of reading, DC and 0.1 Hz-1 MHz measurement bandwidths, and up to four input elements, the WT3000 provides higher-accuracy measurement of inverter I/O efficiency.	Total harmonic measurement and analysis function Voltage fluctuation/flicker measurement function Higher power accuracy	Up to six Input elements in one instrument (3 phase power input from two systems in one unit) 6.4-Inch TFT Color LCD Wide voltage and current input range	Entry class model Compact design (half-rack size) and superior cast performance 5 mA range for very low current measurements (model WT210 only)
Input elements	1 to 4	1 to 3	1 to 6	1 (WT210), 2 or 3 (WT230)
Basic power accuracy (50/60 Hz)	0.02% of rdg + 0.04% of rng	0.04% of rdg + 0.04% of rng	0.1% of rdg + 0.05% of rng	0.1% of rdg + 0.1% of rng
Power measurement frequency range	DC, 0.1 Hz to 1 MHz	DC, 2 Hz to 300 kHz	DC, 0.5 Hz to 1 MHz	DC, 0.5 Hz to 100 kHz
Input voltage range	15/30/60/100/ 150/300/600/1000 V	10/15/30/60/100/ 150/300/600 V	1.5/3/6/10/15/30/60/ 100/150/300/600/1000 V	15/30/60/150/300/600 V
Input current range	Direct input: 0.5/1/2/5/10/20/30 A or 5 m/10 m/20 m/50 m/100 m/200 m/500 m/1/2 A External input: 50/100/200/500 mV/1/2/5/10 V	Direct input: 1/2/5/10/20/30 A External input: 50 m/100 m/200 mV	Direct input: 10 m/20 m/50 m/100 m/200 m/500 m/1/2/5 A or 1/2/5/10/20/50 A External input: 50 m/100 m/250 m/500 m/1/2.5/5/10 V	Direct input: 5 m /10 m/20 m/50 m/100 m/200 m/500 m/1/2/5/10/20 A (WT210) Direct input: 500 m/1/2/5/10/20 A (WT230) External input (option): 2.5/5/10 V or 50 m/100 m/200 mV
Measurement parameters	Voltage, Current, Active power, Reactive power, Apparent power, Power factor, Phase angle, Peak voltage, Peak current, Voltage Frequency, Current Frequency, Active power integration, Apparent power integration, Reactive power integration, Current integration, Corrected power, Crest factor, Efficiency, Harmonic analysis	Voltage, Current, Active power, Reactive power, Apparent power, Power factor, Phase angle, Peak voltage, Peak current, Voltage Frequency, Current Frequency, Active power integration, Current integration, Efficiency, Harmonic analysis, Flicker measurement	Voltage, Current, Active power, Apparent power, Reactive power, Power factor, Phase angle, Peak voltage, Peak current, Voltage Frequency, Current Frequency, Active power integration, Current integration, Crest factor, Form factor, Impedance, Resistance, Reactance, Corrected Power, Harmonic analysis	Voltage, Current, Active power, Reactive power, Apparent power, Power factor, Phase angle, Peak voltage, Peak current, Voltage Frequency, Current Frequency, Active power integration, Current integration, Harmonic analysis
Display	8.4-inch TFT color LCD	7-segment LED, 4 displays	6.4-inch TFT color LCD	7-segment LED, 3 displays
External dimensions (mm) (W × H × D)	426 × 177 × 459	426 × 132 × 400	426 × 177 × 400	213 × 88 × 379 (WT210) 213 × 132 × 379 (WT230)
Weight (kg)	15	13	15	3 (WT210), 5 (WT230)

PZ4000 Power Analyzer

Models	PZ4000
Items	
Features	A power analyzer that displays measured waveforms Wide bandwidth, high-precision measurements A power analyzer capable of dynamically capturing load fluctuations Graphical power analysis
Input elements	1 to 4 or 1 to 3 + Sensor input
Basic power accuracy (50/60 Hz)	0.1% of rdg + 0.025% of rng
Power measurement frequency range	DC, 0.1 Hz to 1 MHz
Input voltage range	30/60/120/200/300/600/ 1200/2000 V peak
Input current range	Direct input 5 A: (253751, 253752) 0.1/0.2/0.4/1/2/4/10 Apeak Direct input 20 A: 1/2/4/10/20/ 40/100 Apeak (253752 only) External input: 100/200/400/1000 mVpeak
Measurement parameters	Voltage, Current, Active power, Apparent power, Reactive power, Power factor, Phase angle, Peak voltage, Peak current, Voltage Frequency, Current Frequency, Crest factor, Form factor, Impedance, Resistance, Reactance, Efficiency, Corrected Power, Harmonic analysis
Display	6.4-inch TFT color LCD
External dimensions (mm) (W × H × D)	426 × 177 × 450
Weight (kg)	15

*About CW series Clamp-on Power Meters, please refer to the page 63.

High-end Power Analyzer with Best-in-Class Precision $\pm 0.02\%$ of Reading and High Stability



WT3000



Overview

For three-phase power metering, the WT3000 Precision Power Analyzer provides a basic power accuracy of $\pm 0.02\%$ of reading. It also offers bandwidth for DC or 0.1 Hz–1 MHz and accepts up to 4 input elements, facilitating high precision efficiency measurements through simultaneous measurement during I/O of inverters and other items under test. This, coupled with the ability to perform normal power and harmonic measurements simultaneously, means that the WT3000 can offer higher accuracy in evaluation of instruments and higher efficiency.

Model Number and Suffix Codes

Model	Suffix Codes	Description	
760301		WT3000 1 input element model	
760302		WT3000 2 input elements model	
760303		WT3000 3 input elements model	
760304		WT3000 4 input elements model	
Element number	-01	30A input element	for 760301 model
	-02		for 760302 model
	-03		for 760303 model
	-04		for 760304 model
	-10	2A input element	for 760301 model
	-20		for 760302 model
	-30		for 760303 model
	-40		for 760304 model
Version	-SV	Standard Version	
	-MV	Motor Version	
Power cord	-D	UL/CSA standard	
	-F	VDE standard	
	-R	SAA standard	
	-Q	BS standard	
	-H	GB standard	
Options	/G6	Advanced Computation (IEC standard testing*, harmonic, FFT, Waveform computation)	
	/B5	Built-in Printer	
	/DT	Delta Calculation	
	/FQ	Add-on Frequency Measurement	
	/DA	20ch D/A output	
	/V1	VGA Output	
	/C2 Select	Serial (RS-232) Interface	
	/C12 one	USB port (PC)	
	/C5	USB port (Peripheral)	
	/C7	Ethernet function	
/CC	Cycle by Cycle		
/FL	Voltage Fluctuation, Flicker		

* requires 761922 software

Note: Mixing of the 30 A and 2 A input elements is not supported, whether purchasing a new unit or reworking an existing one. Also, the unit cannot be modified to change the current range. Adding input modules after initial product delivery will require rework at the factory. Please choose your models and configurations carefully, and inquire with your sales representative if you have any questions.

Features

- High accuracy and wide frequency range
- Up to 4 input elements
- Low power factor error
- Effective input range: 1% to 130%
- Simultaneously measurement with 2 units
- Data update rate: 50 ms to 20 sec
- Variety of display formats:
 - Numeric, Waveform, Bar graph, Vector, Trend, MATH, FFT, CC
- IEC harmonic measurement in combination with software (761922)
- IEC Flicker measurement (/FL option)
- Storage function (approximately 30 MB internal memory)
- Motor efficiency and total efficiency measurement (Motor version)

Basic Specifications

- Measurement voltage range:
 - 15/30/60/100/150/300/600/1000 V (for crest factor 3)
 - 7.5/15/30/50/75/150/300/500 V (for crest factor 6)
- Measurement current range:
 - Direct input (30 A input element)
 - 500 mA/1/2 /5/10/20/30 A
 - Direct input (2 A input element)
 - 5 m/10 m/20 m/50 m/100 m/200 m/500 m/1/2 A
 - External sensor input
 - 50/100 /200/500 mV/1/2/5/10 V
- Frequency range:
 - DC, 0.1 Hz to 1 MHz
- Accuracy (45 to 66 Hz):*greater than or equal to 500 mA range
 - Voltage/current $\pm(0.01\%$ of reading + 0.03% of range)
 - Power $\pm(0.02\%$ of reading + 0.04% of range)
- Influence of power factor (λ):
 - When $\lambda = 0$
 - Apparent power reading $\times 0.03\%$ in the 45 to 66 Hz range
- External dimensions:
 - Approx. 426 (W) \times 177 (H) \times 459 (D) mm
- Weight:
 - Approx. 15 kg
 - (including main unit, 4 input elements, and options)

A High-Precision, Wide Frequency Range, Digital Power Meter with up to Six Input Elements



WT1600



Overview

The WT1600 is a power meter designed to measure extremely small currents in energy-saving equipments, as well as large currents for evaluating large-sized loads. The WT1600 works with voltages ranging from 1.5 V up to 1000 V and supports a wide range of applications. A WT1600 can measure I/O signals on inverters, because it can accept signal inputs for up to six phases

Model Number and Suffix Codes

Model	Suffix codes	Description
760101		WT1600 digital power meter main unit
Element types and quantities The numbers in the "Description" column have the following meanings. 50: 50 A input element 5: 5 A input element Blank: No element Elements are inserted in the order shown starting on the left side on the back.		Element Number
		1 2 3 4 5 6
	-01	50
	-02	50 50
	-03	50 50 50
	-04	50 50 50 50
	-05	50 50 50 50 50
	-06	50 50 50 50 50 50
	-10	5
	-11	5 50
	-12	5 50 50
	-13	5 50 50 50
	-14	5 50 50 50 50
	-15	5 50 50 50 50 50
	-20	5 5
	-21	5 5 50
	-22	5 5 50 50
	-23	5 5 50 50 50
	-24	5 5 50 50 50 50
	-30	5 5 5
-31	5 5 5 50	
-32	5 5 5 50 50	
-33	5 5 5 50 50 50	
-40	5 5 5 5	
-41	5 5 5 5 50	
-42	5 5 5 5 50 50	
-50	5 5 5 5 5	
-51	5 5 5 5 5 50	
-60	5 5 5 5 5 5	
Communication functions	-C1	GP-IB
	-C2	Serial (RS-232)
Power cord	-D	UL/CSA Standard
	-F	VDE Standard
	-R	SAA Standard
	-Q	BS Standard
	-H	GB Standard
Option specifications	/B5	Internal printer
	/C7	SCSI interface
	/C10	Ethernet, HDD, SCSI
	/DA	30-channel DA output
	/MTR	Motor evaluation function

* The WT1600 unit cannot be purchased without any elements. Select an element type (5 A or 50 A) and quantity.

Note: In order to add elements and options after the WT1600 has been delivered, the WT1600 must be modified at the factory. Be aware of this in making your product selections. For further details, see Yokogawa's home page or contact our sales office.

Features

- Up to six input elements in one instrument (3 phase power input from two systems in one unit)
- Wide frequency range
- Wide current input range: 10 mA to 5 A or 1 A to 50 A
- Wide voltage input range: 1.5 V to 1000 V
- 50 ms data storing interval
- Standard integration and harmonic measurement functions
- Variety of display formats:
 Numeric, Waveform, Bar graph, Vector, Trend
- Standard external current sensor input for use with current clamps
- Motor evaluation function (optional)
- 30ch D/A output (optional)
- Built-in printer (optional)
- Ethernet function (optional)

Basic Specifications

- Measurement voltage range
 1.5/3/6/10/15/30/60/100/150/300/600/1000 V
 (DC, 0.5 Hz to 1 MHz)
- Measurement current input range (Direct input)
 5 A input element
 10/20/50/100/200/500 mA, 1/2/5 A
 (DC, 0.5 Hz to 1 MHz)
 50 A input element
 1/2/5/10/20/50 A (DC, 0.5 Hz to 100 kHz)
 External sensor input (same for 5 A and 50 A input elements)
 50/100/250/500 mV, 1/2.5/5/10 V (DC, 0.5 Hz to 500 kHz)
- Basic accuracy: (45 Hz ≤ f ≤ 66 Hz)
 Voltage/Current/Power:
 ±(0.1% of rdg + 0.05% of rng)
- Effective of power factor (at cos φ = 0)
 ±0.15% of rng added
- External dimensions:
 Approx. 426 (W) × 177 (H) × 400 (D) mm
- Weight: Approx. 15 kg (with 6-input element)

Digital Sampling Power Meters with Superior Cost Performance



WT210

For standby low-power measurements and rated-power measurements.
A single-phase model



WT230

For measurement applications from low-frequency equipment to high frequency inverters.
A three-phase model



Overview

The WT210 and WT230 are compact, half-rack sized power meters. They are suited for a wide range of applications from low-frequency instruments to inverters, and offer improved basic accuracy and bandwidth. WT210 also has the same 5 mA range as WT200 allowing measurement of the extremely small currents found in energy-saving designs and intermittent control devices.

Features

- Maximum input with assured accuracy: 26 A
- Compact design (half-rack size)
- 5 mA range for very low current measurements (model WT210 only)
- Line filter function
- High-speed data update (as fast as 10 readings per second)
- Harmonic measurement function available (optional)
- User calibration capability
- Large-current measurement capability using external sensor input (optional)

Basic Specifications

- Measurement voltage range
Voltage: 15/30/60/150/300/600 V
- Measurement current range
Direct input:
5 m/10 m/20 m/50 m/100 m/200 mA
0.5/1/2/5/10/20 A (WT210),
0.5/1/2/5/10/20 A (WT230)
External Sensor input (optional):
2.5/5/10 V or 50/100/200 mV
- Frequency range:
DC and 0.5 Hz to 100 kHz
- Basic accuracy (45 Hz ≤ f ≤ 66 Hz)
Voltage/current/power
±(0.1% of rdg + 0.1% of rng)
- Effect of power factor (at cos φ = 0)
±0.2% of rng added
- External dimensions:
approx. 213 (W) × 88 (H) × 379 (D) mm (WT210)
approx. 213 (W) × 132 (H) × 379 (D) mm (WT230)
- Weight: approx. 3.0 kg (WT210)
approx. 5.0 kg (WT230)

Wiring Types and Model Numbers

Wiring	Model	760401	760502	760503
Single-phase 2-wire		✓	✓	✓
Single-phase 3-wire		–	✓	✓
Three-phase 3-wire (2 voltages, 2 currents)		–	✓	✓
Three-phase 3-wire (3 voltages, 3 currents)		–	–	✓
Three-phase 4-wire		–	–	✓

Model Number and Suffix Codes

Model number	Suffix code	Description	
760401		WT210 single-input element model	
Power cord	-D	UL/CSA standard	
	-F	VDE standard	
	-R	AS standard	
	-Q	BS standard	
	-H	GB standard	
Options	/C1	GP-IB communication interface	Select one
	/C2	Serial (RS-232-C) communication interface	one
	/EX1	External input 2.5/5/10 V	Select one
	/EX2	External input 50/100/200 mV	one
	/HRM	Harmonic measurement function	
	/DA4	4-channel DA output	Select one
	/CMP	Comparator and D/A, 4 channels each	one

Note: The WT210 communication interface cannot be changed or modified after delivery.

Model number	Suffix code	Description	
760502		WT230 2-input element model	
760503		WT230 3-input element model	
Interface	-C1	GP-IB communication interface	Select one
	-C2	Serial (RS-232-C) communication interface	one
Power cord	-D	UL/CSA standard	
	-F	VDE standard	
	-R	AS standard	
	-Q	BS standard	
	-H	GB standard	
Options	/EX1	External input 2.5/5/10 V	Select one
	/EX2	External input 50/100/200 mV	one
	/HRM	Harmonic measurement function	
	/DA12	12-channel DA output	Select one
	/CMP	Comparator and D/A, 4 channels each	one

An Innovative Power Analyzer that Uses High-speed Sampling, Wide Frequency Range, and Waveform Analysis to Capture Transient Power Values



PZ4000



Overview

In the power electronics field, power measurement requires wide bandwidth performances to evaluate low to high frequencies and distorted waveform signals. The PZ4000 offers wide measurement bandwidths of up to 2 MHz and 5MS/s high-speed sampling to make accurate power measurement. With its LCD color display, the PZ4000 can display a wide variety of measurement parameters and analyze input waveforms as well. Various analysis functions are available to measure fluctuated or transient power during power activation or changes of motors, lighting, etc, which are difficult to measure with conventional power meters.

Basic Specifications

- Measurement voltage range
30/60/120/200/300/600/1200/2000 Vpk (Max. 1000 Vrms)
- Measurement current range
Direct input:
0.1/0.2/0.4/1/2/4/10 Apk
(Max. 5 Arms) for 253751 and 253752
1/2/4/10/20/40/100 Apk
(Max. 20 Arms) for 253752
External input:
100/200/400/1000 mVpk
(Max. 500mVrms)
- Frequency range: DC to 2 MHz
- Basic accuracy (45 Hz ≤ f ≤ 66 Hz)
Voltage/current: ±(0.1% of rdg 0.05% of rng)
Power: ±(0.1% of rdg +0.025% of rng)
Effect of power factor: ±0.15% of S reading added
(S: apparent power)
- External dimensions: Approx. 426 (W) × 177 (H) × 450 (D) mm
- Weight: Approx. 15 kg (with 4-input module)



- 253751 Power measurement module:
Voltage direct input ranges:
30, 60, 120, 200, 300, 600, 1200, 2000 Vpk (1000 Vrms)
Current direct input ranges: 0.1, 0.2, 0.4, 1, 2, 4, 10 Apk (5 Arms)
Current sensor input ranges: 0.1, 0.2, 0.4, 1 Vpk (500 mVrms)
- 253752 Power measurement module:
Voltage direct input ranges:
30, 60, 120, 200, 300, 600, 1200, 2000 Vpk (1000 Vrms)
Current direct input ranges:
0.1, 0.2, 0.4, 1, 2, 4, 10 Apk (5 Arms, upper terminal)
1, 2, 4, 10, 20, 40, 100 Apk (20 Arms, lower terminal)
Current sensor input ranges: 0.1, 0.2, 0.4, 1 Vpk (500 mVrms)
- 253771 Sensor input module:
Torque computing analog input: 1 /2 /5 /10 /20 /50 Vpk
Revolution speed computing analog input: 1 /2 /5 /10 /20 /50 Vpk
Revolution speed computing pulse input:
Maximum input range ±5 Vpk
Effective input range Min. 1 Vp-p

Features

- Wide measurement bandwidth (DC, up to 2 MHz).
- Accurate capturing of input waveforms using high-speed (maximum 5 MS/s) sampling.
- Voltage and current waveform display and analysis functions to enable power calculations on fluctuating inputs.
- Harmonic analysis (up to 500th order) and Fast Fourier Transform (FFT) functions to enable high-frequency power spectrum analysis.
- Multiple channel, synchronized measurements using multiple units and Master-Slave trigger function simplifies complex investigations.
- Variety of display formats: Numeric, Waveform, Bar graph, Vector, X-Y
- Environmentally friendly design based on Yokogawa's Guidelines on Designing Products for the Environment and Criteria for Environmental Assessment in Product Design.
- Sensor input module option enables evaluation of motor efficiency and total efficiency including the motor drive.

Model Number and Suffix Codes

Main unit

Model	Suffix Code	Description
253710		PZ4000 Power Analyzer
Power cord	-D	UL/CSA Standard
	-F	VDE Standard
	-R	SAA Standard
	-Q	BS Standard
	-H	GB Standard
Options	/M1	Memory extension to 1 M word/CH
	/M3	Memory extension to 4 M word/CH
	/B5	Built-in printer
	/C7	SCSI interface

Plug-in modules

Model	Suffix Code	Description
253751		Power measurement module Voltage: 1000 V Current: 5 A Current sensor: 500 mV
253752		Power measurement module Voltage: 1000 V Current: 5 A and 20 A Current sensor: 500 mV
253771 *		Sensor input module Torque / Revolution speed input
Module specifications	-E1	Plug-in unit

* Sensor input module can be used element 4 slot only.

Digital Power Meters

WT2010/WT2030

<http://www.yokogawa.com/tm/WT2010/>

For Precision Harmonic Analysis and Voltage Fluctuation/Flicker Measurement



WT2010/WT2030
Digital Power Meters

- Basic power accuracy: 0.04% of reading
- Harmonics analysis conforms to IEC61000-3-2
- Voltage fluctuation and flicker measurement conforms to IEC61000-3-3
- Best resolution of 50000 counts
- Holding function for peak and maximum values

■ Model and suffix codes

Model	Suffix codes	Description
253101		Single phase mode
253102		3-phase, 3-wire model
253103		3-phase, 4-wire model
Interface	-C1	GP-IB
	-C2	RS-232-C
Supply voltage	-1	100 V AC (50/60 Hz)
	-3	115 V AC (50/60 Hz)
	-5	200 V AC (50/60 Hz)
	-7	230 V AC (50/60 Hz)
Power cord	-M	UL/CSA standard 3 to 2 pin conversion adapter
	-D	UL/CSA standard
	-F	VDE standard
	-R	SAA standard
	-J	BS standard
	-H	GB standard
Additional specifications	/B5	Built-in printer
	/HRM	Harmonic analysis function
	/DA	D/A output (14 channels)
	/FL	Flicker measurement function

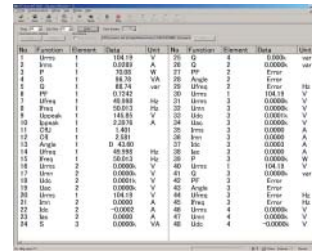
WT2010/WT2030 Specifications

- Rated values (range)
Voltage: 10/15/30/60/100/150/300/600 V
Current
Direct input: 1/2/5/10/20/30 A
External shunt input: 50/100/200 mV
- Frequency range:
DC and 2 Hz to 500 kHz (for power, up to 300 kHz)
- Basic accuracy (45 Hz $\leq f \leq$ 66 Hz)
Voltage/current:
 $\pm(0.03\%$ of rdg + 0.03% of mg)
Power: $\pm(0.04\%$ of rdg + 0.04% of mg)
Effect of power factor (at cos $\phi = 0$)
 $\pm 0.1\%$ of mg added
- External Dimensions:
approx. 426 (W) \times 132 (H) \times 400 (D) mm
Weight: Approx. 13 kg (3-element model)
Approx. 10 kg (1-element model)

Application Software for Power Meters

760122/761922

View Numeric Data on Your PC

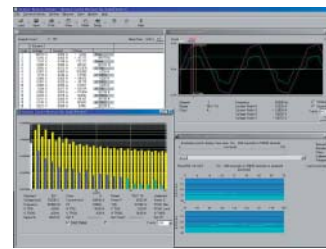


760122

WTViewer Software

WTViewer is an application software tool that reads numeric, waveform, and harmonic data measured with the WT300, WT1600, WT210 and WT230.

Software for Standards-Compliant Measurements



761922

Harmonic/Flicker Measurement Software (WT3000/G6 and/FL are required)

The Harmonic/Flicker Measurement Software (Model 761922) loads data measured by the WT3000 and performs harmonic analysis that complies with IEC61000-3-2 edition 2.2. You can use the model 761922 harmonic measurement software to perform harmonic measurement tests conforming to IEC 61000-4-7 edition 2 (window width is 10 cycles of 50 Hz and 12 cycles of 60 Hz) with WT3000.

Current Sensor Units

751521/751523

http://www.yokogawa.com/tm/wtpz/wtacc/tm-wtacc_01.htm

Accessory for Digital Power Meters and Power Analyzer



751521
(for single-phase measurements)

751523
(for three-phase measurements)



751521/751523

Current Sensor Units

- Use model 751521 for single-phase measurements and model 751523 for three-phase measurements.
- Wide dynamic range -600 A-0A-600 A (DC), 600 A peak (AC)
- Wide bandwidth DC-100 kHz
- High accuracy $\pm(0.05\%$ of reading + 40 μ A)
- Achieves superior noise resistance and CMR characteristics from its optimized rectangular design
- Accuracy assurance and calibration when combined with the WT digital power meters or the PZ power analyzer

751521/751523 Specifications

Input format: Floating input method using a CT (s)

Rated Current:

- DC -600 A-0-600 A
- AC 600 A peak

Output current: 400 mA (when the rated 600 A input current is flowing)

Input/Output Ratio: 1500 : 1

Accuracy:

- DC $\pm(0.05\%$ of rdg + 40 μ A)
- 45 Hz $\leq f \leq$ 66 Hz $\pm(0.05\%$ of rdg + 40 μ A)
- Frequency Band: DC-100 kHz (-3dB)

External dimensions

- 751521: Approx. 426 (W) \times 221 (H) \times 430 (D) mm
- 751523: Approx. 426 (W) \times 355 (H) \times 430 (D) mm
(excluding the input terminal, feet, and other protrusions)

Weight

- 751521: Approx. 14 kg
- 751523: Approx. 24 kg

Current Transducer

751574

http://www.yokogawa.com/tm/wtpz/wtacc/tm-wtacc_01.htm

Accessory for Digital Power Meters and Power Analyzer



751574

Current Transducer

Yokogawa's current transducer model 751574 is a large-current measurement DC-CT used inside current sensor units 751521 and 751523. It is especially valuable for applications with limited installation space such as measurements in embedded systems and measurements in actual vehicles (e.g., EV/HEV). (Note: A separate drive DC power supply is required. In addition, precision guarantee conditions may differ from those of the current sensors, depending on conditions such as the conductor position of the input primary wiring.)

- Wide dynamic range -600 A-0A-600 A (DC), 600 A peak (AC)
- Wide bandwidth DC-100 kHz
- High accuracy $\pm(0.05\%$ of rdg + 40 μ A)

751574 Specifications

Rated Current:

- DC -600 A-0-600 A
- AC 600 A peak

Output current: 400 mA (when the primary rated current of 600 A is flowing)

Current transformation Ratio: 1500:1

Accuracy:

- DC $\pm(0.05\%$ of rdg + 40 μ A)
- 50/60 Hz $\pm(0.05\%$ of rdg + 40 μ A)

Frequency band: DC-100 kHz (-3dB)

External dimensions:

- Approx. 122 (W) \times 98 (H) \times 57 (D) mm
(excluding the connector, primary cable guide, and other protrusions)

Weight: Approx. 1 kg.

Power Measuring Instruments **Accessories List**

Product	Part No.	Description	Image				
				WT3000	WT1600	WT210/WT230	PZ4000
1:1 BNC safety adapter lead	701901	1000 Vrms-CAT II, 1.8 m long Safety BNC (male) to safety banana (female) use in combination with 701959, 701954, 758921, 758922 or 758929		●	●	●	●
Measurement leads	758917	Two leads in a set. Use 758917 in combination with 758922 or 758929. Total length: 75 cm Rating: 1000 V, 32 A		●	●	●	●
Small alligator adapters	758922	For connection to measurement leads (758917). Two in a set. Rating: 300 V		●	●	●	●
Large alligator adapters	758929	For connection to measurement leads (758917). Two in a set. Rating: 1000 V		●	●	●	●
Safety terminal adapter set	758923	(spring-hold type) Two adapters in a set.		●	●	●	●
Safety terminal adapter set	758931	Screw-fastened adapters. Two adapters in a set. 1.5 mm Allen wrench included for tightening.		●	●	●	●
Fork terminal adapter	758921	Two adapters (red and black) to a set. Used when attaching banana plug to binding post.		●	●	●	●
Conversion adapter	758924	For conversion between BNC and female banana plug		●	●	●	●
Conversion adapter	366971	9-pin/25-pin conversion adapter		●	●		●
External sensor cable	B9284LK	For the external input of the WT210 and WT230. Length: 50 cm		●	●	●	●
BNC cable	366924	BNC cable BNC-BNC, 1 m		●	●		●
BNC cable	366925	BNC cable BNC-BNC, 2 m		●	●		●
Compact instrument cart	701960	500 (W) × 560 (D) × 705 (H) mm /A: keyboard, mouse table /B: 3-prong power strip		●	●	●	●
Deluxe instrument cart	701961	570 (W) × 580 (D) × 893 (H) mm /A: keyboard, mouse table /B: 3-prong power strip		●	●	●	●
All-Purpose instrument cart	701962	467 (W) × 693 (D) × 713 (H) mm		●	●	●	●
Rack mounting kit	751535-E4	For EIA		●	●		●
Rack mounting kit	751535-J4	For JIS		●	●		●
Rack mounting kit	751533-E2	For WT210 EIA standalone installation				●	
Rack mounting kit	751533-J2	For WT210 JIS standalone installation				●	
Rack mounting kit	751534-E2	For WT210 EIA connected installation				●	
Rack mounting kit	751534-J2	For WT210 JIS connected installation				●	
Rack mounting kit	751533-E3	For WT230 EIA standalone installation				●	
Rack mounting kit	751533-J3	For WT230 JIS standalone installation				●	
Rack mounting kit	751534-E3	For WT230 EIA connected installation				●	
Rack mounting kit	751534-J3	For WT230 JIS connected installation				●	

Continuous Measurement Up to 80 MS/s



TA720

Time Interval Analyzer

- Maximum Continuous Sampling Rate 80 MS/s
- Sampling rate:
 - 80MS/s continuous (at Single measurement function)
 - 50MS/s continuous (at Dual measurement function)
- Sampling Modes:
 - Time stamp mode (T.S. Mode), Hardware histogram mode (H.H. Mode), Inter-symbol interference analysis mode (ISI mode)
- Dual Measurement Function
 - This function enables two measurements to be done simultaneously.
- Inter-Symbol Interference Analysis Function
- Ethernet/PC Card Interface (optional)
- Built-in Printer (standard)
- GP-IB Interface (standard)
- 3.5-inch floppy drive (standard)
- TFT color LCD screen

Measurement at a Maximum Rate of 14 MS/s



TA320

Time Interval Analyzer

- Max. sampling rate: 14 MS/s
- Sample size: up to 99,999,999 (10^8-1)
- Display resolution: 100 ps
- Easy operation with touch screen
- Compact and lightweight (approx. 5 kg) design
- High-speed display update rate
- Measured data or the like can be stored because of incorporated 3.5-inch floppy disk drive

TA320 Specifications

- Measuring functions:
 - period, pulse width, duty ratio, A to B interval, A to B to A interval, Phase difference
- Time stamp mode
 - Measuring range: 30 ns to 100 ms, 5 ns to 100 ms (in TI measurement)
 - Sample size: maximum of 32000
- Hardware histogram mode
 - Measuring range: 30 ns to 3.2 μ s, 5 ns to 3.2 μ s (in TI measurement)
 - Sample size: maximum of 99,999,999
- Gating functions:
 - internal (time/event) or external gate
 - time gate: 1 μ s to 10 s
 - event gate: 1 to 32000 (up to 99,999,999 in hardware histogram mode)
- Arming: internal or external
 - External arming
 - time delay: 1 μ s to 1 s
 - event delay: 1 to 30000
- External dimensions:
 - approx. 213 (W) \times 132 (H) \times 392 (D) mm
- Weight: Approx. 5 kg

Jitter Measuring Instrument Designed for Production Line Applications for Blu-ray Disc



TA220

Digital Jitter Meter

- Blu-ray Disc equalizer and PLL
- Limit equalizer (optional)
- Capable of measuring data-to-clock jitter and pulse width jitter
- Standard-equipped with function for analyzing data-to-clock jitter excluding 2T
- Inhibit function and block sampling function
- Standard-equipped with Ethernet and GP-IB interfaces
- A variety of display capabilities, with analog meter and two LED indicators
- Measurement Items
 - Data-to-clock phase difference jitter and average value
 - Pulse width jitter and average value (arbitrarily set window range LEFT or RIGHT)
 - Level measurement
 - Measuring range: 100 mVp-p to 2 Vp-p (3 mVp-p resolution)
- Equalizer
 - Conventional equalizer circuit: ON/OFF (Blu-ray Disc standard Part1 Version 1.0 compliant)

High Precision, TIA Jitter Measurement



TA120F

Digital Jitter Meter

- High-precision, high-repeatability measurements using the TIA measurement principle
- High-speed measurements (maximum speed: 50 ms)
- Applicable to CD/DVD
- External synchronization enabled by inhibit and external arming functions
- Bi-phase measurement (optional)
- External I/O control (optional)
- Level measurement (optional)

TA120F Specifications

- Sampling rate: 10 MSps (at data-to-clock phase difference jitter measurements)
- Internal jitter: 3T jitter: 300 ps rms
 - Data-to-clock phase difference jitter: 400 ps rms
- Measured parameters: 3T jitter, data-to-clock phase difference jitter, and moving average
 - 3T jitter: CDx1/arbitrary (x1.0 to x10)
 - Data-to-clock phase difference jitter: 0 ns to 40 ns
- Measurement update rate: maximum 50 ms (at 100,000 samples, DVDx1, measurement on both edges)
- Sample size: 100,000 samples/100 ms/500 ms/arbitrary (1.0 ms to 1 second, 0.1 ms steps)
- Input specifications:
 - RF input
 - Input signal: RF signal (before/after passing equalizer, equalizer ON/OFF switching), binary signal (minimum input pulse width: 15 ns)
 - Trigger level: MAN = -5 V to +5 V (1 mV steps), AUTO = Auto-slice, AUTO + MANUAL = AUTO + set value
- Clock input:
 - maximum input frequency: 25 MHz to 60 MHz
 - Phase adjustment: 0 to 40 ns (0.1 ns steps)
- Preset function:
 - up to 7 settings can be saved
 - The desired setting can be loaded
- External dimensions:
 - Approx. 213 (W) \times 132 (H) \times 350 (D) mm
- Weight: Approx. 5 kg

Function Generators

FG210/FG220/FG310/FG320/FG120/FG110

<http://www.yokogawa.com/tm/signalgenerator/tm-fg.htm>

Frequency Range 1 μHz to 15 MHz



FG210, FG220, FG310, FG320
Synthesized Function Generators

- Generating frequencies:
 - 1 μHz to 15 MHz (sine waves and square waves)
 - 1 μHz to 200 kHz (triangular, pulsed, and arbitrary)
- Independent 2 channels (FG220/FG320)
- Multiple sweep functions and modulation functions
- Intuitive operation with large LCD panel and touch screen

FG200/FG300 Specifications

- Number of signal outputs:
 - 1 (for FG210 or FG310)
 - 2 (for FG220 or FG320)
- Output waveforms: sine waves
 - Square waves (duty ratio 50% fixed)
 - Triangular waves (symmetry variable)
 - Pulse waves (duty ratio variable)
 - Arbitrary waves (FG310/FG320)
- Operation mode:
 - continuous, trigger or gate oscillation, DC output
- Frequency range
 - Sine and square waves:
 - 1 μHz to 15 MHz
 - Triangular and pulse waves:
 - 1 μHz to 200 kHz
 - Arbitrary waves: 1 μHz to 200 kHz
- Frequency resolution:
 - 1 μHz or 9 digits max.
- Max. output voltage: ±10 V (high-impedance load)
- Output impedance: 50 Ω ± 1%
- Sweep types:
 - linear, log, linear step, log step, and arbitrary patterns (FG310/FG320)
- Sweepable parameters:
 - frequency, amplitude, offset phase, duty ratio, frequency and amplitude
- Modulation types:
 - AM, DSB-AM, FM, phase modulation, offset modulation, or PWM
- External dimensions:
 - approx. 213 (W) × 132 (H) × 350 (D) mm
- Weight: Approx. 5 kg

Frequency Range 1 μHz to 2 MHz



FG120/FG110
Synthesized Function Generator

- Completely independent 2-channel output (FG120)
- Output waveform: sine, square, triangular, ramp and pulse
- Output frequency: DC and 1 μHz to 2 MHz (sine and square waves)
- Max. output voltage: ±10 V
- Compact (A4 size), lightweight (approx. 3.6 kg) and low cost

FG120/FG110 Specifications

- Number of signal outputs:
 - 1 (use 706011 (FG110))
 - 2 (use 706012 (FG120))
- Output waveforms:
 - sine, triangular, square wave (duty ratio 50% fixed), ramp, pulse (duty ratio 5 to 95% variable)
- Operation mode:
 - continuous, trigger or gate oscillation, DC output
- Output frequency range
 - Sine and square waves:
 - 1 μHz to 2 MHz
 - Triangular, ramp, and pulse waves:
 - 1 μHz to 100 kHz
- Frequency resolution: 1 μHz or 10 digits
- Max. output voltage: ±10 V*
- Output impedance: 50 Ω ± 1%
- GP-IB interface equipped as standard
- External dimensions:
 - approx. 213 (W) × 100 (H) × 330 (D) mm
- Weight: Approx. 3.6 kg

*(Maximum amplitude plus offset with high-impedance load)

CE*: except 706011-1/-4, 706012-1/-4 models

Universal Counters

TC110/TC120

<http://www.yokogawa.com/tm/tc/tm-tc.htm>

Wide Measuring Range from 1 mHz to 2 GHz (TC120)



TC110/TC120
Universal Counter

- Measuring frequency range:
 - 1 mHz to 2 GHz (TC120)
 - 1 mHz to 120 MHz (TC110)
- Resolution of 8 digits in 1 s
- Easy 1-action operation with 1 key
- Convenient auto-trigger function
- Measurement of revolution (TC110 only)

TC110/TC120 Specifications

- Frequencies A, B, and C Measurable range
 - A: 1 Hz to 120 MHz (1/2-prescaler)
 - B: 1 mHz to 60 MHz
 - C: 100 MHz to 2 GHz (1/128-prescaler)
- Period B
 - Measuring range: 20 ns to 999.999999 s
- Time interval A→B
 - Measuring range: 60 ns to 999.999999 s
- Pulse width B
 - Measuring range: 20 ns to 999.999999 s
- Duty ratio B
 - Measuring range: 0.00000001 to 0.99999999
 - Input range: 20 ns to 999.999999 ns
- Frequency ratio A/B
 - Measuring range: A and B:
 - 1 mHz to 60 MHz
- Totalization A
 - Input frequency range: 1 mHz to 50 MHz
 - Counting capacity: 0 to 999999999
- Revolution B (TC110 only)
 - Measuring range: 60 mrpm to 120 Mrpm
- Peak voltage A and B
 - Measuring voltage range:
 - ±5 V (ATT = x1)
 - Frequency range: 50 Hz to 20 MHz
- External dimensions:
 - approx. 213 (W) × 100 (H) × 330 (D) mm
- Weight: Approx. 3.6 kg

Digital Multimeters

7555/7561/7562

<http://www.yokogawa.com/tm/gmi/tm-gmi.htm>

5.5 Digits Digital Multimeter



7555

Digital Multimeter

- Fast sampling at 125 times/s
- Communication function
Adoption of command languages used in our and other companies' DMMs
- Large current measurement up to 200 A DC (with the use of 751106 current clamp)
- Scanner Function for multi-points measurement. (Up to 8 ch, optional)
- D/A output and BCD output functions

7555 Specifications

- DC voltage (DCV)
Range: 200 mV to 1000 V
- DC current (DCA)
Range: 2 mA to 2000 mA
Measurable up to 200 A if current clamp (751106) is used.
- AC voltage (ACV)
Range: 200 mV to 700 V (true rms value measuring method)
- AC current (ACA)
Range: 2 mA to 2000 mA
Measurable up to 150 A if current clamp (751106) is used.
- Resistance measurement (OHM, 2 W/4 W)
Range: 200 Ω to 200 M Ω
- Maximum indication: 199999
- RS-232C interface (standard)
- GP-IB interface (optional)
- External dimensions:
approx. 213 (W) \times 88 (H) \times 379 (D) mm
- Weight: approx. 3.5 kg

6.5 Digits Digital Multimeter



7561/7562

Digital Multimeters

- High accuracy (DC voltage-based accuracy)
 $\pm 0.003\%$ of reading ± 15 digits
- Fast sampling at 333 times/s
- Large capacity buffer memory: up to 8000 data items
IC memory card usable
- GP-IB interface (standard)

7561/7562 Specifications

- DC voltage (DCV)
Range: 200 mV to 1000 V
- DC current (DCA)
Range: 2 mA to 2000 mA
- AC voltage (ACV)(7562 only)
Range: 200 mV to 700 V
- AC current (ACA)(7562 only)
Range: 2 mA to 2000 mA
- Resistance measurement (OHM, 2 W/4 W)
Range: 200 Ω to 200 M Ω
- Maximum indication: 1999999
- External dimensions:
approx. 213 (W) \times 88 (H) \times 330 (D) mm
- Weight: approx. 3 kg

Digital Resistance Meter

7556

http://www.yokogawa.com/tm/gmi/7651/tm-7651_01.htm

High-speed Resistance Meter for Production Line of Fixed Chip Resistors



7556

Digital Resistance Meter

- High-speed measurement (2.8 ms)
- Highly accurate $\pm(0.006\%$ of reading + 3 digits in 755611)
- High resolution (5.5 digits in 755611)
- Wide range (1 Ω range to 100 M Ω range)
- Full remote control through serial (RS-232) or GP-IB interface
- Software-based calibration function
- Printer output of measurement results and statistics
- Advanced contact check function

7556 Specifications

- Range: 1 Ω , 10 Ω , 100 Ω , 1 k Ω , 10 k Ω , 100 k Ω , 1 M Ω , 10 M Ω , 100 M Ω
- Resolution
Deviation display
755601: -99.99% to 199.99%
-99.9% to 199.9% (selectable)
755611: -99.999% to 199.999%
-99.99% to 199.99% (selectable)
- Absolute value display
755601: 100 $\mu\Omega$ (at 1 Ω range)
755611: 10 $\mu\Omega$ (at 1 Ω range)
- Measurement time
Normal mode: 60 Hz power supply: 19.9 ms
50 Hz power supply: 23.2 ms
Fast mode: 5.7 ms
High speed mode: 2.8 ms
- Accuracy (at 1 k Ω range, 23 \pm 5 $^{\circ}$ C, normal mode)
755601: $\pm(0.015\%$ of reading + 1 digit)
755611: $\pm(0.006\%$ of reading + 3 digits)
- Contact check function
Check level: 1 Ω to 30 Ω (selectable)
Execute checks before or after a measurement (selectable)
Check current: 50 mA
Contact check error message with display and handler interface
Measured current abnormality message with display and handler interface
- Comparator function (both Hi and Lo)
Deviation setting range
755601: -9.99% to 9.99%
-99.9% to 99.9% (selectable)
755611: -9.999% to 9.999%
-99.99% to 99.99% (selectable)
- Absolute value setting range
755601: 0.000 Ω to 1.200 Ω
755611: 0.0000 Ω to 1.2000 Ω
- Data memory: Max. 2000 data

Scanner

7501

http://www.yokogawa.com/tm/gmi/7501/tm-7501_01.htm

Switching for Up to 50 Channels Wide Variety of Relay Cards; Digital I/O Card



7501

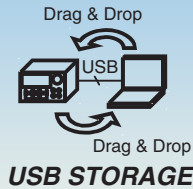
Programmable Scanner

- Switching for up to 50 channels
- Four types of relay cards and a digital I/O card
- Switching program of up to 100 steps can be stored
- GP-IB interface (standard)

7501 Specifications

- Scan interval:
arbitrary setting is possible,
20 to 9999 ms (resolution: 1 ms)
1 to 3600 s (resolution: 1 s)
1 to 1440 min (resolution: 1 min)
1 to 24 h (resolution: 1 h)
- Scan start timer:
Scan starting time settable in 1-s steps;
internal clock with calendar function
- External trigger input/Closed output
Working temperature/humidity ranges
5 $^{\circ}$ to 40 $^{\circ}$ C, 20 to 80% RH (non-condensing)
- Power supply:
90 to 250 VAC continuous (free setting)
- Power consumption:
20 VA max. (for 5 cards mounted)
- External dimensions:
Approx. 426 (W) \times 88 (H) \times 430 (D) mm
- Weight:
Approx. 5 kg (with relay cards not mounted)
- Card specifications
 - General-purpose multiplexer card:
750611; 10-ch, maximum 40 V/1 A input available
 - Thermocouple multiplexer card:
750612; 10-ch, maximum 40 V/100 mA input available
 - General-purpose actuator card:
750631; 10-ch, 2-wire system, maximum 40 V/1 A input available
 - General-purpose matrix card:
750641; 4 by 4-ch, maximum 40 V/1 A input available
 - Digital I/O card:
750651; 16bits bidirectional,
or 8bits \times 2bidirectional

Combines High Accuracy and High Speed in a Single Unit



Features

The GS610 is a highly accurate and highly functional programmable voltage/current source that incorporates voltage/current generation and measurement functions. The maximum output voltage and current are 110 V and 3.2 A, respectively. Evaluation of over a wide range of basic electrical characteristics is possible, because the GS610 can operate as a current source or a current sink.

- Source and sink operation up to 110 V/3.2 A (four-quadrant operation)
- Basic accuracy: $\pm 0.02\%$ *1
- Sweep output at up to 100 μ s intervals
- Comes with abundant sweep patterns (linear, logarithmic, and arbitrary)
- Stores up to 65535 points of source measure data in the internal memory
- Easy file operation with the USB storage function
- Remote control and FTP using Web server function (Optional)

*1: DC voltage generation

Voltage/Current Generation and Measurement Range

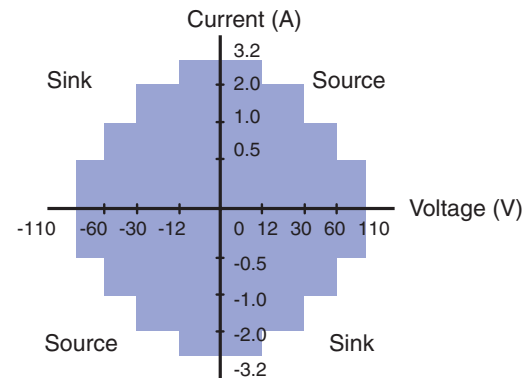
Four-dimensional operation with source operation (current source) and sink operation (current sink) is possible at up to 110 V, 3.2 A, and 60 W. The output and measurement resolutions are 5.5 digits.

Voltage generation/measurement range: 200mV to 110 V

Current generation/measurement range: 20 μ A to 3.2 A

Maximum output current:

- ± 3.2 A (at an output voltage of ± 12 V or less)
- ± 2 A (at an output voltage of ± 30 V or less)
- ± 1 A (at an output voltage of ± 60 V or less)
- ± 0.5 A (at an output voltage of ± 110 V or less)



Programmable DC Source with Sink and Source Function



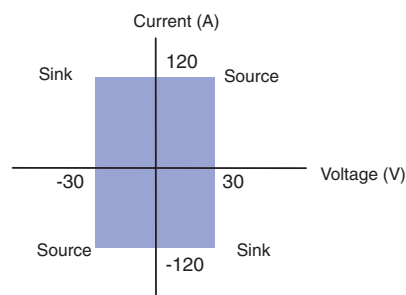
7651

Programmable DC Source

- High accuracy:
 - $\pm 0.01\%$ of setting (voltage)
 - $\pm 0.02\%$ of setting (current)
- High resolution: 100 nV, 10 nA
- Fast response: 10 ms/ $\pm 0.1\%$
- High resolution: 100 nV (DC V, 10 mV range)
- High-speed response: 10 ms/ $\pm 0.1\%$
- Low noise: 15 μ Vp-p (1 V range, DC to 10 Hz)
- Applicable to electronic loads owing to sink action

7651 Specifications

- Output voltage: 10 mV to 30 V, 5 ranges
Maximum output current: ± 120 mA
- Output current: 1 mA to 100 mA, 3 ranges
Maximum output voltage: ± 30 V
- Output setting:
 ± 120000 , but ± 32000 for 30 V



- Response time: 10 ms or less
- Communication function: GP-IB
- Program function: up to 50 steps
Seven patterns can be stored with an IC memory card
Setting of interval/sweep time
- Compact and high accuracy
- Power consumption: about 30 VA
- External dimensions:
213 (W) \times 88 (H) \times 350 (D) mm
- Weight: 3.6 kg
- Other features
 - External trigger function
 - Software calibration function
 - Programmable voltage/current limiter function
 - No glitch design at polarity reversal

*About CA series Handy Calibrators, please refer to the page 64 to 65.

Temperature Measuring Instrument

7563

http://www.yokogawa.com/tm/temperature/7563/tm-7563_01.htm

Precision Digital Thermometer



7563 Specifications

- Maximum display: ± 1999999
 Resolution: Voltage 100 nV
 Resistance 100 $\mu\Omega$
 Thermocouple 0.1°C
 RTD 0.01°C
- Reference junction compensation accuracy: $\pm 0.2^\circ\text{C}$
- Various computation functions
 Software calibration function
 Memory function
- Internal memory up to 1000 data items
 - IC memory up to 8000 data items
- Communication function: GP-IB
 Analog output (optional): code /DA specified
 Power consumption: 20 VA
 External dimensions: 213 (W) \times 88 (H) \times 350 (D) mm
 Weight: approx. 3 kg
- Other features:
- Multipoint measurement up to 50 points available when 750101 programmable scanner is used

7563

Digital Thermometer, 6.5 Digits

- Thermometer has a 6.5-digits display
 Twelve types of TC's and four types of RTD's
- Basic accuracy in temperature measurement: 0.006% (TC)
- Basic accuracy in DCV measurement: 0.0045% (2000 mV range)
- Basic accuracy in resistance measurement: 0.006% (2000 Ω range)
- Number of sampling times: up to 100 times/s (4.5 digits)

Pressure Standard

MC100

http://www.yokogawa.com/tm/mt/mc100/tm-mc100_01.htm

Pneumatic Pressure Standard



MC100 Series Specifications

MC100

Pneumatic Pressure Standard

- High accuracy: $\pm 0.05\%$ of full scale
- Output ranges and resolution
 0 to 200 kPa (resolution 0.01 kPa)
 0 to 25 kPa (resolution 0.001 kPa)
- Functions useful for instrument calibration
 Divider output, auto-step output, and sweep output
- Excellent temperature coefficient
 Zero point: $\pm 0.003\%$ of full scale/ $^\circ\text{C}$
 Span: $\pm 0.002\%$ of full scale/ $^\circ\text{C}$

- Supply pressure
 0 to 200 kPa range model: 280 kPa ± 20 kPa
 0 to 25 kPa range model: 50 kPa ± 10 kPa
- Accuracy
 $\pm 0.05\%$ of full scale (at $23^\circ\text{C} \pm 3^\circ\text{C}$)
- Output noise: $\pm 0.02\%$ of full scale
- Effect of mounting orientation
 Forward/backward incline of 90°
 0 to 200 kPa range model: $\pm 0.01\%$ of full scale
 0 to 25 kPa range model: $\pm 0.1\%$ of full scale
 Sideways incline of 30°
 0 to 200 kPa range model: $\pm 0.2\%$ of full scale
 0 to 25 kPa range model: $\pm 2.5\%$ of full scale
- Pressure display units (selectable):
 kPa, kgf/cm^2 , mmH_2O , mmHg
 kPa, psi, inH_2O , inHg
- External dimensions:
 213 (W) \times 132 (H) \times 400 (D) mm
- Weight: approx. 9.5 kg

Precision Digital Manometer


MT210
Digital Manometer

- High accuracy: $\pm(0.01\%$ of reading + 3 digits) (130 kPa range model)
- A wide range pressures, from a low differential pressure of 1 kPa to a high gauge pressure of 3000 kPa, and absolute pressure of 130 kPa
- D/A conversion output, comparator output, and external trigger input (optional)
- Both gases and liquids measurable
- External attachable battery pack (optional)

MT210 Series Specifications

- Measuring range (gauge pressure: positive) 0 to 10 kPa, 130 kPa, 700 kPa and 3000 kPa
- Measuring range (gauge pressure: negative) -80 to 0 kPa, -10 to 0 kPa
- Measuring range (absolute pressure) 0 to 130 kPa abs
- Measuring range (differential pressure) 0 to 1 kPa, 10 kPa, 130 kPa and 700 kPa
- Accuracy (for 0 to 10 kPa range model) $\pm(0.01\%$ of reading + 0.015% of full scale) (at positive pressure)
- Resolution
 - 0 to 1 kPa range model: 0.00001 kPa
 - 0 to 10 kPa range model: 0.0001 kPa
 - 0 to 130 kPa range model: 0.001 kPa
 - 0 to 700 kPa range model: 0.01 kPa
 - 0 to 3000 kPa range model: 0.01 kPa
- Maximum allowable input (for gauge pressure positive)
 - 0 to 10 kPa range model: 500 kPa gauge
 - 0 to 130 kPa range model: 500 kPa gauge
 - 0 to 700 kPa range model: 3000 kPa gauge
 - 0 to 3000 kPa range model: 4500 kPa gauge
- Pressure display units (selectable): psi, inH₂O, inHg, kPa, kgf/cm², mmH₂O, mmHg
- External dimensions: 213 (W) × 132 (H) × 350 (D) mm
- Weight Approx. 6.5 kg (0 to 130 kPa range model)

Fast Response Digital Manometer


MT210F
Digital Manometer

- High accuracy: $\pm(0.01\%$ of reading + 3 digits) (130 kPa range model)
- Select from three measurement modes: normal speed, medium speed, and high speed
- D/A conversion output, comparator output, and external trigger input (optional)
- Both gases and liquids measurable
- External attachable battery pack (optional)

MT210F Series Specifications

- Measuring range (gauge pressure: positive) 0 to 10 kPa, 130 kPa, 700 kPa and 3000 kPa
- Measuring range (gauge pressure: negative) -80 to 0 kPa, -10 to 0 kPa
- Measuring range (absolute pressure) 0 to 130 kPa abs
- Accuracy (for 0 to 10 kPa range model) $\pm(0.01\%$ of reading + 0.015% of full scale) (at positive pressure)
- Response time (0 to 130 kPa range model, at high speed mode) 50 msec max.
- Readout update interval (at medium and high speed mode) 100 msec
- Resolution
 - 0 to 10 kPa range model: 0.0001 kPa
 - 0 to 130 kPa range model: 0.001 kPa
 - 0 to 700 kPa range model: 0.01 kPa
 - 0 to 3000 kPa range model: 0.01 kPa
- Maximum allowable input (for gauge pressure positive)
 - 0 to 10 kPa range model: 500 kPa gauge
 - 0 to 130 kPa range model: 500 kPa gauge
 - 0 to 700 kPa range model: 3000 kPa gauge
 - 0 to 3000 kPa range model: 4500 kPa gauge
- Pressure display units (selectable): psi, inH₂O, inHg, kPa, kgf/cm², mmH₂O, mmHg
- External dimensions: 213 (W) × 132 (H) × 350 (D) mm
- Weight Approx. 6.5 kg (0 to 130 kPa range model)

Digital Manometer For Efficient Field Calibration


MT220
Digital Manometer

- The de facto standard of field calibrators for pressure and differential pressure transmitters
- High accuracy: $\pm(0.01\%$ of reading + 3 digits) (130 kPa range model)
- DCV/DCA measurement function (DMM function)
- 24 VDC power supply for driving the transmitter
- % display, error display, and measured data memory
- D/A conversion output, comparator output, and external trigger input (optional)
- Both gases and liquids measurable
- External attachable battery pack (optional)

MT220 Series Specifications

- Measuring range (gauge pressure: positive) 0 to 10 kPa, 130 kPa, 700 kPa and 3000 kPa
- Measuring range (gauge pressure: negative) -80 to 0 kPa, -10 to 0 kPa
- Measuring range (absolute pressure) 0 to 130 kPa abs
- Accuracy (for 0 to 10 kPa range model) $\pm(0.01\%$ of reading + 0.015% of full scale) (at positive pressure)
- Resolution
 - 0 to 10 kPa range model: 0.0001 kPa
 - 0 to 130 kPa range model: 0.001 kPa
 - 0 to 700 kPa range model: 0.01 kPa
 - 0 to 3000 kPa range model: 0.01 kPa
- Maximum allowable input (for gauge pressure positive)
 - 0 to 10 kPa range model: 500 kPa gauge
 - 0 to 130 kPa range model: 500 kPa gauge
 - 0 to 700 kPa range model: 3000 kPa gauge
 - 0 to 3000 kPa range model: 4500 kPa gauge
- Pressure display units (selectable): psi, inH₂O, inHg, kPa, kgf/cm², mmH₂O, mmHg
- Measurement range of DCV/DCA measurement function
 - 0 to ± 5.25 V
 - 0 to ± 21 mA
- Accuracy of DCV/DCA measurement function (6 months after calibration) $\pm(0.05\%$ of reading + 3 digits)
- 24 VDC output 24 \pm 1 VDC, 30 mA max.
- External dimensions: 213 (W) × 132 (H) × 350 (D) mm
- Weight Approx. 7.0 kg (0 to 130 kPa range model)

Handheld Digital Manometer


MT10
Mini-Manometer

- Compact and lightweight (approx. 700 g), battery-operated
- High reliability (silicon resonant sensor adopted)
- Accuracy: $\pm(0.04\%$ of rdg + 0.03% of FS) for 130 kPa model
- Three models for 130 kPa, 700 kPa, and 3000 kPa (gauge pressure)
- Data hold function
- RS-232-C interface
- Comes with carrying case

MT10 Series Specifications

- Type of pressure: gauge
- Three measuring ranges 0 to 130 kPa, 0 to 700 kPa, and 0 to 3000 kPa
- Measurement display range: -2.5 to 110% of FS
- Accuracy:
 - 0 to 130 kPa range model $\pm(0.04\%$ of rdg + 0.03% of FS)
 - 0 to 700 kPa and 0 to 3000 kPa range models $\pm 0.1\%$ of FS
- Resolution
 - 0 to 130 kPa range model: 0.01 kPa
 - 0 to 700 kPa range model: 0.1 kPa
 - 0 to 3000 kPa range model: 1 kPa
- Maximum allowable input
 - 0 to 130 kPa range model: 500 kPa
 - 0 to 700 kPa range model: 1000 kPa
 - 0 to 3000 kPa range model: 4500 kPa
- Effect of temperature
 - Zero: $\pm 0.02\%$ of FS/10°C or less
 - Span: $\pm 0.02\%$ of FS/10°C or less
- Pressure display units (specified at shipment) kPa, kgf/cm², mmH₂O, mmHg, Psi, inH₂O, inHg
- External dimensions: Approx. 72 (W) × 174 (H) × 60 (D) mm (excluding input connections)
- Weight: Approx. 700 g (including battery)

Modular Type Measuring Instruments for Easy Operation



WE500

WE900



only on sale in the United States, the United Kingdom, Germany, France, the Netherlands, Spain, Italy, South Korea, Australia, and Japan.

Features

- Modular Design for easy operation
 - Modules for a Variety of Signals and Extensive Features
 - Easily Control All Modules Using the Control Software
 - Control Software that brings out the full functionality of the WE7000
 - Network-Friendly Measuring Instrument
- USB2.0**
Simply connect a USB cable and communication is ready
Provides high-speed data communication using USB 2.0 (up to 480 Mbps)
- Ethernet (100Base-TX/10Base-T)**
Enables remote monitoring and measurement using the network such as a corporate LAN
- Optical Communication**
Provides optical communication interface with outstanding noise resistivity
Best suitable for use under noisy environment such in a strong magnetic field
High-speed data communication up to 250 Mbps
- Utility Software for More Convenience
 - Transformation into Dedicated Measuring Instrument by Customization
 - Embedded Modules That Enable High Speed and Independent Processing (Option)

Overview

- **Simple data acquisition without any software development**
Each WE7000 system includes the standard control software and each module has its firmware resident within the module.
- **Isolation and noise immunity**
Isolation and noise immunity are very important for mechanical electronics. WE7000 has great isolation from the base station to the input modules as well as channel to channel (depending on the module) isolation.
- **Various precision modules with traceability**
WE7000 has various modules from 2 Hz to 100 MS/sec digitizing rates. There are also modules with signal output capability, including a precision D/A and a function generator.
- **Remote control and monitoring using Ethernet Communication**
WE7000 control, monitoring, and real time saving of data are all available using Ethernet communication.

Specifications

Number of slots:

WE500:

5 measurement modules or 4 measurement modules + 1 communication module (when using optical communication)

WE900:

9 measurement modules or 8 measurement modules + 1 communication module (when using optical communication)

Interface for communicating with the PC:

USB (Complies with USB Rev. 2.0), Ethernet (10Base-T or 100Base-TX)

External dimensions:

WE500:

Approx. 213 (W) × 266 (H) × 360 (D) mm (projections excluded)

WE900:

Approx. 350 (W) × 266 (H) × 360 (D) mm (projections excluded)

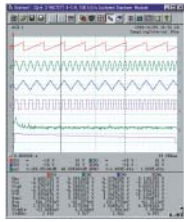
List of Measurement Module Features

Product	Model Number	Bandwidth	Number of Channels	Isolation	Input Coupling	Range	Resolution bit	Maximum Memory (point)	Memory Partition	I/O Connector	Link Feature	Maximum number of waveforms displayed simultaneously	Scaling Feature	Other Features	Power Consumption	Number of Used Slots/Weight
WE7111 100 MS/s Digital Oscilloscope Module	7071 11/HE	DC to 40 MHz	1	No	DC/AC /GND	5 mV/div to 5 V/div (1-2-5 steps)	8	100 k	None	BNC	Yes	9	No	Automated measurement of waveform parameters Calibration signal output	Approx. 15 VA	1 Approx. 0.9 kg
WE7116 2-CH, 20 MS/s Digitizer Module	7071 16/HE	DC to 8 MHz	2	No	DC/AC /GND	±100 mV to 50 V (1-2-5 steps)	12	4 M	Up to 1024	BNC	Yes	18	Yes	Calibration signal output	Approx. 10 VA	1 Approx. 0.7 kg
WE7275 2-CH, 1 MS/s Isolated Digitizer Module	7072 75/HE	DC to 400 kHz	2	Yes	DC/AC	±100 mV to 200 V (1-2-5 steps), 350 V	14	4 M	Up to 256	BNC	Yes	18	Yes	Anti-aliasing filter OFF/20 Hz to 40 kHz (2-4-8 steps)	Approx. 14 VA	1 Approx. 0.8 kg
WE7273 8-CH, 100 kS/s Isolated Digitizer Module	7072 73/HE	DC to 40 kHz	8	Yes	DC/AC	±50 mV to 50 V (1-2-5 steps)	16	8 M	Up to 256	Clamp terminal	Yes	72	Yes		Approx. 20 VA	1 Approx. 0.9 kg
WE7271 4-CH, 100 kS/s Isolated Digitizer Module	7072 71/HE	DC to 40 kHz	4	Yes	DC	±1 V to 20 V (1-2-5 steps), ±35 V	16	4 M	Up to 256	Clamp terminal	Yes	36	Yes		Approx. 12 VA	1 Approx. 0.7 kg
WE7272 4-CH, 100 kS/s Isolated Digitizer Module	7072 72/HE	DC to 40 kHz	4	Yes	DC	±1 V to 20 V (1-2-5 steps), ±35 V	16	4 M	Up to 256	BNC	Yes	36	Yes		Approx. 12 VA	1 Approx. 0.7 kg
WE7251 10-CH, 100 kS/s Digitizer Module	7072 51/HE	DC to 10 kHz	10	No L and common	DC	±1 V to 20 V (1-2-5 steps)	16	1 M	Up to 256	Input unit sold separately	Yes	90	Yes	Multiplex type	Approx. 8 VA	1 Approx. 0.7 kg
WE7241 10-CH Thermometer Module	7072 41/HE	Scan interval 0.5 s or longer	10	Yes	DC	K, E, J, T, L, U, N, R, S, B, W, KPtvsAU7Fe ±50 mV to 50 V (1-2-5 steps)	14	None	---	Input unit sold separately	Yes	90	Yes	Multiplex type	Approx. 7 VA	1 Approx. 0.8 kg
WE7245 4-CH, 100 kS/s Strain Module	7072 45/HE	DC to 20 kHz	4	Yes	DC	1000 μs to 20000 μs strain, ±100 mV to ±20 V (1-2-5 steps)	15	4 M	Up to 256	Dsub (9-pin)	Yes	36	Yes	1, 2, or 4 gauges, DC bridge Gauge resistance 120 to 1 kΩ, auto balance	Approx. 15 VA	1 Approx. 1 kg
WE7235 4-CH, 100 kS/s Accelerometer Module	7072 35/HE	DC to 40 kHz	4	No	DC (voltage only) /AC	Gain: x1 (5 V) to x100 (50 mV) (1-2-5 steps)	16	4 M	Up to 256	BNC	Yes	36	Yes	Anti-aliasing filter OFF/20 Hz to 40 kHz (2-4-8 steps)	Approx. 12 VA	1 Approx. 0.8 kg
WE7141 100 MHz Universal Counter Module	7071 41/HE	1 Hz 120 MHz	2	No	DC/AC	Period, time interval, pulse width, duty cycle, frequency ratio, totalize count measurements	---	None	---	BNC	No	1	Yes	D/A output	Approx. 6 VA	1 Approx. 0.7 kg
WE7521 4-CH Timing Measurement Module	7075 21/HE	100 ns to 20 s	4	No	DC/AC	Period, time interval, totalize count, up and down count, and frequency ratio measurements	---	4 M	Up to 256	BNC	Yes	32	Yes	Time stamp measurement	Approx. 8 VA	1 Approx. 0.7 kg
WE7121 10 MHz Function Generator Module	7071 21/HE	1 μHz to 10 MHz	1	No	---	±10 V (resolution 1 mV)	12	16 k	None	BNC	Yes	---	---	Arbitrary waveform output	Approx. 7 VA	1 Approx. 0.7 kg
WE7281 4-CH, 100 kS/s D/A module	7072 81/HE	DC to 20 kHz	4	Yes	---	±1 V to 10 V (1-2-5 steps)	16	4 M	Up to 256	Clamp terminal	Yes	---	---	Sweep function, arbitrary waveform output	Approx. 15 VA	1 Approx. 0.9 kg
WE7282 4-CH, 100 kS/s D/A Module	7072 82/HE	DC to 20 kHz	4	Yes	---	±1 V to 10 V (1-2-5 steps)	16	4 M	Up to 256	BNC	Yes	---	---	Sweep function, arbitrary waveform output	Approx. 15 VA	1 Approx. 0.7 kg
WE7262 32-bit Digital I/O Module	7072 62/HE	---	32	No	---	TTL level (input), CMOS level (output)	---	None	---	Dsub (25-pin)	No	32	---	2-MHz counter feature Connect the 707823/707824 and input/output contact signals	Approx. 4 VA	1 Approx. 0.6 kg
WE7081 CAN Bus Interface Module	7070 81/HE	---	---	---	---	---	---	---	---	Dsub (9-pin)	---	64	Yes	CAN data I/O	Approx. 5 VA	1 Approx. 0.7 kg
WE7562 Multi-Channel Analyzer Module	7075 62/HE	2 inputs, 0 to 10 V, AD channels: 512 to 16 k 6 stages, shaping time > 500 ns	---	---	---	---	---	2000 frames (1 kCH)	---	BNC	Yes	2	Yes	PHA, MCS, LIST Mode	Approx. 15 VA	1 Approx. 0.8 kg

Application Software for WE7000

7077 02/7077 03/7077 14
7077 51/7077 61

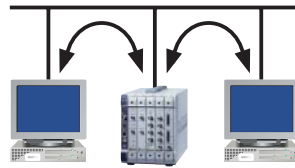
<http://www.yokogawa.com/tm/WE7000/>



7077 02
Computation Function Setup Software

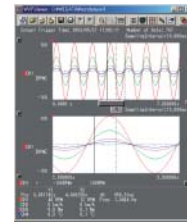
- Software utility that adds data computation function to the WE7000 Control Software.
- Enables four arithmetic operations, FFT analysis, filter functions, waveform parameter measurement, etc.

Ethernet or optical communications



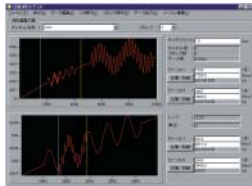
7077 03
Remote Monitor Add-On Software

- Multiple PCs can use a single measuring station.
- Other PCs can monitor the waveform while one PC is performing measurements. Measurement parameters can also be viewed.
- Able to block other PCs from starting or stopping measurements or changing measurement parameters while one PC is using the measuring station (Access Authority Control).
- Able to block other PCs from controlling or viewing the measuring instrument (Lock function).



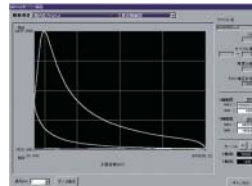
7077 14
Computation Waveform Viewer

- Can display waveforms of the WE7000 or DL Series data as well as compute and analyze the data on the PC
- Equipped with extensive computation functions



7077 51
Arbitrary Waveform Editor

- Create and edit data for the WE7121 and WE7281/82
- Can edit waveforms of up to 4 M data points
- Can load measured data (WVF format) and Excel (CSV format) files
- Edit data within the specified interval (functions and dots)



7077 61
Engine Combustion Pressure Analysis Package

- Offline analysis software for the measured data for the WE7275
- Supports 4- to 8-cylinder engines
- Equipped with standard analysis items (functions) required for the combustion pressure analysis

WE7000 Utility Software

Type	Product	Model Number	Specifications
Added on to the Control Software	Computation Function Setup Software	707702	Adds computation functions to the Control Software
	Remote Monitor Add-On Software	707703	Adds remote monitor function to the Control Software
Package software	Computation Waveform Viewer	707714	Waveform Viewer for the WE7000, DL, etc.
	Arbitrary Waveform Editor	707751	Arbitrary waveform data editor for the WE7121 and WE7281/82
	Engine Combustion Pressure Analysis Package	707761	Offline combustion pressure analysis for the WE7275

Software for developing user application programs

Product	Model Number	Specifications
WVF File Access API	707712	API for accessing WVF
WVF File Access Tool Kit for MATLAB	707713	MATLAB toolkit for accessing WVF
WE Control API	707741	Functions for controlling the WE7000
Add On Tool for WE API Vol. 1	707742	ActiveX controls for Visual Basic
Add On Tool for WE API Vol. 2	707743	ActiveX controls for Visual Basic (for display)
Control Tool Kit for LabVIEW	707746	Toolkit for LabVIEW
Control Tool Kit for MATLAB	707747	Toolkit for MATLAB

OTDR

AQ7270

fiberXplorer™

<http://www.yokogawa.com/tm/AQ7270/>

Superior cost performance, easy to operate.



Specifications

- Horizontal Axis Parameters:
 - Sampling resolution: 5 cm, 10 cm, 20 cm, 50 cm, 1 m, 2 m, 4 m, 8 m, 16 m, 32 m
 - Readout resolution: 1 cm (Min.)
 - Number of sampled data: Up to 50,000 points
- Vertical Axis Parameters:
 - Vertical axis scale: 0.2 dB/div, 0.5 dB/div, 1 dB/div, 2 dB/div, 5 dB/div, 7.5 dB/div
 - Readout resolution: 0.001 dB(Min.)
- Memory capacity: 1000 waveforms or more
Can store measured waveforms, and measurement conditions
- Display: 8.4 inch color TFT (640 × 480 pixels)
- External dimensions: 287 (W) × 197 (H) × 85 (D) mm
(not including projections or options)
- Weight: Approx. 2.8 kg (not including options)

Features

- Short dead zone (0.8 m)
- Wide range of models available supporting FTTH to metro networks
- High performance & easy to use OTDR
- Bright & high contrast 8.4 inch LCD screen
- 11-model Lineup

Specifications by model

Single-mode Fiber 1 Wavelength Type

Model	735020	735021 ¹²
Wavelength	1550±25nm	1650 ± 5nm ¹¹ ±10nm ²
Applicable fiber	SM (ITU-T G.652)	
Distance range	500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km, 200km, 300km, 400km	
Pulse width ³	3ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1us, 2us, 5us, 10us, 20us	
Dynamic range ⁴	32dB	30dB
Event dead zone ^{5, 11}	0.8m	0.8m
Attenuation dead zone ^{6, 11}	8m (typ)	12m (typ)

Single-mode Fiber 2 Wavelength Type

Model	735022	735023	735024
Wavelength	1310/1550±25nm	1310/1550±25nm	1550/1625±25nm
Applicable fiber	SM (ITU-T G.652)		
Distance range	500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km, 200km, 300km, 400km		
Pulse width ³	3ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1us, 2us, 5us, 10us, 20us		
Dynamic range ⁴	34/32dB	40/38dB	38/35dB
Event dead zone ^{5, 11}	0.8m	0.8m	0.8m
Attenuation dead zone ^{6, 11}	7/8m (typ)	7/8m (typ)	8/12m (typ)

Single-mode Fiber 3 Wavelength Type

Model	735025	735026	735027 ¹²	735028
Wavelength	1310/1490/1550±25nm	1310/1550/1625±25nm	1310/1550±25nm 1650±5nm ¹¹ , ±10nm ²	1310/1550/1625±25nm
Applicable fiber	SM (ITU-T G.652)			
Distance range	500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km, 200km, 300km, 400km			
Pulse width ³	3ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1us, 2us, 5us, 10us, 20us			
Dynamic range ⁴	34/30/32dB	34/32/28dB	34/32/30dB	40/38/35dB
Event dead zone ^{5, 11}	0.8m	0.8m	0.8m	0.8m
Attenuation dead zone ^{6, 11}	7/8/8m (typ)	7/8/12m (typ)	7/8/12m (typ)	7/8/12m (typ)

Multimode Fiber 2 Wavelength Type

Model	735029
Wavelength	850/1300±30nm
Applicable fiber	GI (50/125, 62.5/125μm)
Distance range	500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km
Pulse width ^{3, 7}	10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1us, 2us, 5us
Dynamic range ^{8, 10}	22.5/24dB
Event dead zone ^{9, 10, 11}	2m (typ)
Attenuation dead zone ^{6, 10, 11}	7/10m (typ)

Multimode/Single-mode Fiber 4 Wavelength Type

Model	735030
Wavelength	1310/1550±25nm
Applicable fiber	SM (ITU-T G.652) GI (50/125, 62.5/125μm)
Distance range	500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km, 200km, 300km, 400km
Pulse width ³	3ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1us, 2us, 5us, 10us, 20us
Dynamic range	34/32dB ⁴ 22.5/24dB ^{8, 10}
Event dead zone	0.8m ^{5, 11} 2m (typ) ^{9, 10, 11}
Attenuation dead zone	7/8m (typ) ¹¹ 7/10m (typ) ^{6, 10, 11}

¹ At a point -20 dB from the pulse light output peak value (measured 30 min. or more after power ON, ambient temperature of 23°C)

² At a point -60 dB from the pulse light output peak value (measured 30 min. or more after power ON, ambient temperature of 23°C)

³ Pulse width setting range depends on the distance range.

⁴ SNR=1, at pulse with 20 μs, distance range 200 km, sampling resolution 32 m, measurement time 3 minutes.

⁵ Pulse width 3 ns, return loss 45 dB or more, at a point 1.5 dB below the peak value (not saturated).

⁶ Pulse width 10 ns, return loss 45 dB or more, at a point where the backscatter level is within ±0.5 dB of the normal value.

⁷ Pulse width of 2 or 5 μs when measured wavelength is 1300 nm

⁸ SNR=1, at pulse width 200 ns(850nm), 1 μs(1300nm), measurement time 3 minutes.

⁹ Pulse width 10 ns, return loss 45 dB or more, at a point 1.5 dB below the peak value (not saturated).

¹⁰ GI (62.5/125 μm) is measured.

¹¹ At group refractive index 1.5

¹² Pulse light output power at 1650 nm less than 15 dBm

Note: Specifications without any special remarks, assured at 23±2°C

OTDR

AQ7260

<http://www.yokogawa.com/tm/AQ7260/>

Speed, Ease-of-use Increased Efficiency of Optical Network Testing



Features

The AQ7260 OTDR covers a wide range of applications for the installation and servicing of optical networks, with a variety of OTDR modules and optional units

- Sampling resolution: Min. 5 cm
- Sampling points: Max. 60,000
- Fast measurements
- 8.4 inch TFT-LCD color display for easy viewing
- Large internal memory: 20 MB
- USB ports for connectivity and data storage
- Telecordia GR 196 file format for data storage
- Compact and light weight: Approx. 3 kg

Specifications

Main frame

Display: 8.4 inch color TFT (640 × 480 dots)

Horizontal axis:

25 m, 50 m, 100 m, 250 m, 500 m, 1 km, 2 km, 2.5 km, 5 km, 10 km, 20 km, 40 km, 80 km, 160 km, 240 km, 320 km, 640 km (Depend on the optical module)

Readout resolution: Min. 1 cm

Sample data count: Max. 60,000 points

Vertical axis: 0.2 dB/div, 0.5 dB/div, 1 dB/div, 2 dB/div, 5 dB/div, 7.5 dB/div

Readout resolution: Min. 0.001 dB

Return-loss measurement function:

- Return loss at mechanical connectors can be measured.
- Total return loss of a fiber cable or between any two points can be measured.

Dimensions and mass:

Approx. 299 (W) × 225 (H) × 62 (D) mm

Approx. 3 kg (with AQ7264 SMF module mounted)

Optical modules

Center wavelength (nm)

AQ7261 SMF Module: 1310/1550 +/-25

AQ7264 SMF Module: 1310/1550 +/- 20

AQ7265 SMF Module: 1310/1550 +/- 20

AQ7269 MMF/SMF Module: 850/1300 +/- 30 (MMF), 1310/1550 +/- 25 (SMF)

Measured fiber: SM (ITU-T G.652)

Distance range (km):

2, 5, 10, 20, 40, 80, 160, 240, 320/640 (Depend on the optical module)

Distance sampling resolution: Min. 5 cm

Dynamic range (dB):

AQ7261 SMF Module: 34/32, 35/33 (typ.)

AQ7264 SMF Module: 40/38, 42/40 (typ.)

AQ7265 SMF Module: 43/41, 45/43 (typ.)

AQ7269 MMF/SMF Module: 22.5/24 (MMF), 34/32 (SMF)

(SNR=1, for 3 minutes, at 20 us pulse width)

Measurement Examples

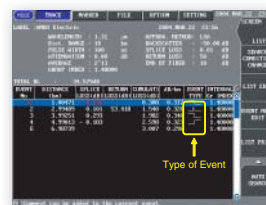
Simultaneous display of trace and event table



After performing an Auto Event Search, the trace and event table are simultaneously displayed on the screen.

Alternatively, you can choose to display just a trace or event table on the screen.

Event types shown in event table



In the event table, symbols enable you to identify the types of events.

Symbol	Description
	Positive loss event
	Negative loss event
	Reflection at a mechanical connection

Ordering Information

Model name	Suffix code	Descriptions
813920300		AQ7260 OTDR
	-ESTD	Standard software in English
	-KSTD	Standard software in Korean
	-CSTD	Standard software in Chinese
	-020M	Memory capacity: 20 MB
	-STD	Standard Spec (liquid crystal)
813920301	/PKA	Pack with main frame when delivering
	/CE	With CE markings
		AC adapter for AQ7260 OTDR
	-A	JIS standard (2P)
	-C	UL and CSA standard (UL2P)
	-F	VDE standard (CEE-C2)
813920303	-G	SAA standard (AS2P)
	-H	BS standard (BS546 2P)
	-J	BS standard (BS2P)
	/PKA	Pack with main frame when delivering

Model name	Suffix code	Descriptions
813920303	-STD01	AQ7264 SMF module
	/PKA	Pack with main frame when delivering
	/PKD	Pack with module when delivering
	/CE	With CE markings
813920304	-STD01	AQ7261 SMF module
	/PKA	Pack with main frame when delivering
	/PKD	Pack with module when delivering
	/CE	With CE markings
735010	-STD00	AQ7265 SMF module
	/PKA	Pack with main frame when delivering
	/PKD	Pack with module when delivering
	/CE	With CE markings
735011	-STD00	AQ7269 MMF/SMF module
	/PKA	Pack with main frame when delivering
	/PKD	Pack with module when delivering
	/CE	With CE markings
813917321		AQ9441(***) Universal Adapter
	-FCC	FC connector
	-SCC	SC connector
	-STC	ST connector
	-DIN	DIN connector
	/PKA	Pack with main frame when delivering
	/PKD	Pack with module when delivering

Two adapters (AQ9441) are necessary for AQ7269 MMF/SMF Modules.

Model name	Suffix code	Descriptions
813920302		Printer/FDD unit for AQ7260
	-N	Normal Standard (Printer and Floppy Disk)
	-P	Printer only
	/Y	Yokogawa name plate
955-892900215	/CE	With CE markings
		Rolling paper (TP-312C) Unit of sales : 10 rolls

Model name	Suffix code	Descriptions
813920305		Soft carrying case for AQ7260

Model name	Suffix code	Descriptions
813920306		Battery pack (spare) for AQ7260
	/PKA	Pack with main frame when delivering

Model name	Suffix code	Descriptions
735070		AQ7932 OTDR Emulation Software
	-EN	English installer, English display, for 813920300-ESTD
	-CH	English installer, Chinese display, for 813920300-CSTD
	-KO	English installer, Hangul display, for 813920300-KSTD

Handy Optical
Powermeter & Light Source

AQ2160-01/AQ2160-02/AQ4270-01

<http://www.yokogawa.com/tm/optical/tm-opt.htm>

Simplified Functions Bring Superior Cost Performance



AQ2160-01
Optical Powermeter

The AQ2160-01 is a compact, lightweight, cost-effective optical powermeter designed for optical fiber line installation and maintenance. The AQ2160-01 is a new de facto standard of handheld optical powermeters focusing on the ease of use, including simple operation, convenient backlighting, and safe transport using the neck strap.

Powerful Tools for Installation of Optical Fiber Networks with High-performance, Durability and Robustness



AQ2160-02
Optical Powermeter

The AQ2160-02 is a full-featured handheld optical power meter that can measure the relative and absolute optical power for CW and chopped light, and is equipped with the data storage capability. With the USB interface the AQ2160 can transfer the measured data from an internal memory to a PC.



AQ4270-01
LD Light Source (1310/1550 nm)

The AQ4270-01 is a rugged durable handheld LD light source that is operable in the temperature from 0°C to 50°C and conforms the waterproofing standard IEC60529 IP×1. The AQ4270-01 can output two wavelengths (1310/1550 nm), and is easy to maintain due to a user cleanable input connector.

Traffic TesterMini

AE5501

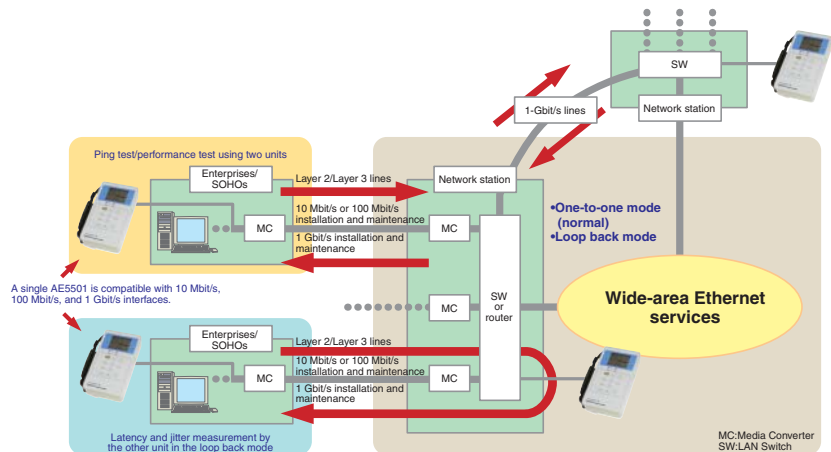
<http://www.yokogawa.com/tm/AE5501/>

A single unit can test Ethernet network at 10 Mbit/s, 100 Mbit/s, and 1 Gbit/s



AE5501
TrafficTesterMini

AE5501 is designed for installation and maintenance of networks such as wideband Ethernet and CATV access networks, working in Layer 2 to Layer 3. It has various hardware interfaces (10BASE-T upto 1000BASE-T, SX, LX) to flexibly adapt to multiple Ethernet networks, in a simple operation.



TrafficTesterPro

AE5511

<http://www.yokogawa.com/tm/AE5511/>

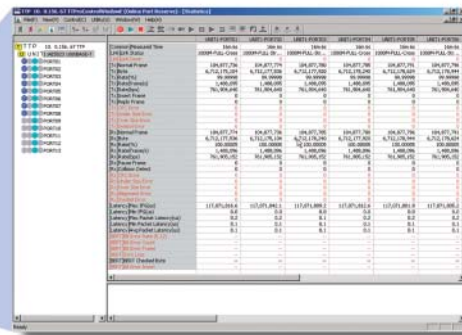
Cost Effective Multi-port IP Performance Test Tool



Features

- Supports 10 Mbit/s to 10 Gbit/s Ethernet
- A PC can control up to 16 frames (max. 512 ports)
- Full-wire rate traffic generation and statistics monitor function
- Frame BERT (Bit Error Rate Test) capability
- Frame latency and IFG measurement function
- Frame capture function
- Multi-user function allows up to eight users to share a unit
- Ethernet-OAM supported (AE5523 and AE5524)

AE5511 TrafficTesterPro is an IP traffic generation tester that provides test solutions to evaluate and inspect network equipment such as LAN switches, routers, and GE-PON. TrafficTesterPro offers flexible modular designs. Customers can choose and exchange units to support their specific needs or to adapt to new interfaces and standards. Yokogawa is offering a wide variety of units, from highly functional type units, which have all the necessary functions to develop and inspect IP network equipment to affordable units, which provide cost-cutting at production and during shipping inspections.



The Statistical monitor display on the TProControlWindow



Communications/
Network Test
Instruments

Unit	Interface	Number of Ports
AE5520 10/100BASE-T unit	10BASE-T, 100BASE-TX	16 ports
AE5521 1000BASE-X unit	1000BASE-SX, 1000BASE-LX	4 ports (GBIC)
AE5522 10GBASE-X unit	10GBASE-LR, 10GBASE-ER, 10GBASE-SR	2 ports (XENPAK)
AE5523 1000BASE-T unit	10BASE-T, 100BASE-TX, 1000BASE-T	12 ports
	1000BASE-SX/LX	1 port (SFP)
AE5524 1000BASE-X unit	1000BASE-SX, 1000BASE-LX	12 ports (SFP)

Applicable Functions by Unit

FUNCTIONS	AE5520	AE5521	AE5522	AE5523	AE5524
Full-wire rate traffic generation	✓	✓	✓	✓	✓
Latency measurement	✓	✓	✓	✓	✓
Frame BERT	✓	✓	✓	✓	✓
Data Capture	-	-	✓	✓	✓
Multi user Sharing	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	✓	✓
Link down generation	✓ ^{*2}	✓ ^{*2}	✓ ^{*2}	✓	✓
IPv4 emulation	✓	✓	✓	✓	✓
IPv6 emulation	-	-	-	✓	✓
Sequence check	-	-	-	✓	✓
Alarm logging	-	-	-	✓	✓
QoS Statistics monitoring	-	-	-	✓	✓
PoE measurement	-	-	-	✓	-
TX clock adjustment	-	-	-	✓	-
Clock Master/Slave	-	-	-	✓	-
LFS	-	-	✓	-	-
Ethernet-OAM	-	-	✓ ^{*3}	-	-

*1:Can share per unit *2:Only for single link down generation *3:Supports the frame generation and the capture

Model Number and Suffix Code

Product Name	Model Name	Suffix Code	Specification
AE5511 TrafficTesterPro	417322900	-L	JAPAN standard
		-C	UL/CSA standard
		-E	VDE standard
		-G	SAA standard
		-S	BS standard
		-V	GB standard
		-LNJ	Japanese
-LNE	English		
AE5520 10/100BASE-T Unit	417322901		
AE5521 1000BASE-X Unit	417322902		
AE5522 10GBASE-X Unit	417322904		
AE5523 1000BASE-T Unit	731010		
AE5524 1000BASE-X Unit	731011		
RFC2544 Test application for AE5511	731070		

Multi Application
Test System

AQ2200

<http://www.yokogawa.com/tm/AQ2200/>

Build Your Own Test Configurations in Small Footprint



Features

The AQ2200 Multi Application Test System is the ideal system for measuring and evaluating a wide range of optical devices and optical transmitters.

- Flexible and space effective
- Easy-to-View TFT color display
- Remote operation through Ethernet network
- Built-in applications
 - Optical power stability measurement
 - Short-term optical power fluctuation measurement
 - Wavelength dependent loss measurement
 - Bit error rate test (BERT)
 - Optical return loss and insertion loss measurement
- Wide variety of plug-in modules
- Hot-swappable modules

Applications

- 10Gbit/s transceiver measurement system
- GE-PON ONU/OLT measurement system
- GE-PON optical three wavelength filter measurement
- Optical amplifier measurement system
- MUX/DEMUX measurement system

Frame and Module Lineup

- Frame controllers
 - AQ2201 Frame controller (3 slots for modules)
 - AQ2202 Frame controller (9 slots for modules)
- Light source modules
 - AQ2200-111 DFB-LD module (C & L Band, SMF or PMF, 1-slot)
 - AQ2200-136 TLS module (1440-1640nm, SMF, 2-slot)
 - AQ2200-141 FP-LD module (SMF, 1-slot)
 - AQ2200-142 DUAL FP-LD module (SMF, 1-slot)
- Sensor modules and Sensor Heads
 - AQ2200-211 Sensor module (-110dBm, 700-1700nm, 1-slot)
 - AQ2200-215 Sensor module (+30dBm, 970-1660nm, 1-slot)
 - AQ2200-221 Sensor module (Dual sensor, 800-1700nm, 1-slot)
 - AQ2200-201 Interface module (for AQ2200-231 and -241, 1-slot)
 - AQ2200-231 Optical sensor head (Large diameter, 800-1700nm)
 - AQ2200-241 Optical sensor head (Large diameter, 400-1100nm)
- Optical attenuator modules
 - AQ2200-311 ATTN module [w/ Monitor output (optional)] (SMF or MMF, 1-slot)
 - AQ2200-331 ATTN module [w/built-in optical power meter] (SMF or MMF, 1-slot)
- Optical switch modules
 - AQ2200-411 OSW module (1×4 or 1×8, SMF or MMF, 1-slot)
 - AQ2200-412 OSW module (1×16, SMF, 1-slot)
 - AQ2200-421 OSW module (1×2 or 2×2, SMF or MMF, 1-slot)
- 10Gbit/s BERT modules
 - AQ2200-601 10 Gbit/s BERT module (3-slot)
 - AQ2200-621 10 Gbit/s optical modulator (1.55 μm, SMF, 1-slot)
 - AQ2200-622 10 Gbit/s optical modulator (1.31 μm, SMF, 1-slot)
 - AQ2200-631 10 Gbit/s optical receiver (1.31/1.55 μm, SMF, 1-slot)
 - AQ2200-641 XFP interface module

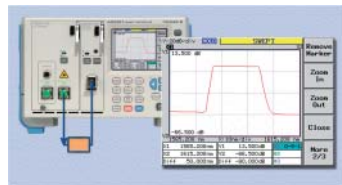


AQ2200 series modules

Passive component test applications



TLS-OSA Sync Sweep



TLS-OPM Sync Sweep

10Gbit/s BERT applications

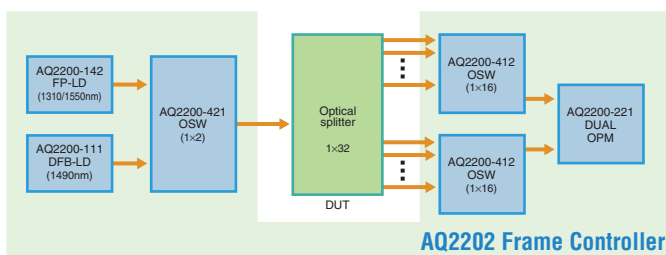


Electrical 10Gbit/s BERT System

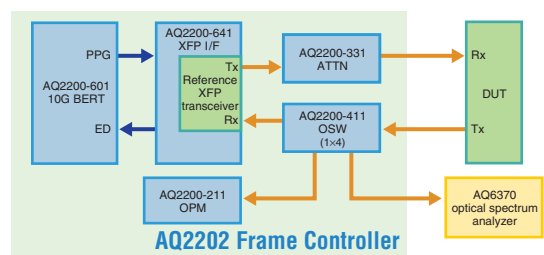


Optical 10Gbit/s BERT System

Optical splitter measurement system for PON



10 Gbit/s transceiver measurement system

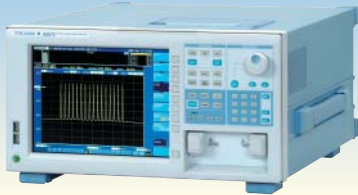


Optical Spectrum Analyzer

AQ6370

<http://www.yokogawa.com/tm/AQ6370/>

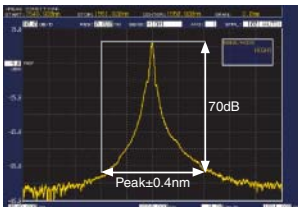
Redefining Optical Spectrum Measurement Excellence



Features

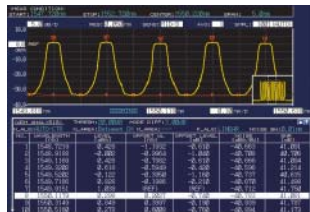
- **World Class Optical Performance & Flexibility***
High wavelength resolution: 0.02 nm (0.015nm typ.)
Wide close-in dynamic range: 70dB typ.
Single and multimode fiber test capability (up to GI 62.5/125µm)
* In the diffraction-grating-based optical spectrum analyzer industry as of January 2006
- **Improved Measurement Throughput**
Fast measurement and fast data transfer
- **Enhanced User Friendliness**
USB for Mouse, keyboard, and external storage devices
Bright 10.4" LCD
Trace zoom capability
Various built-in analysis functions
- **Expedites Development of Automated Test Systems**
Supports GP-IB, RS-232C, and Ethernet interfaces
Compatible with SCPI and supports AQ6317 series remote commands
Built-in simple macro programming function
- **Includes Wavelength Calibration Source**
- **AQ6370 Viewer: Emulation/Remote control software (Optional)**

World-class optical performance



Close-in Dynamic Range

70dB at peak±0.4nm, resolution setting 0.02nm (typical)



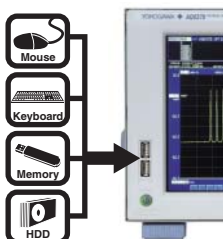
DWDM signal measurement

DWDM channels allocated at 50GHz spacing can be measured and analyzed.

Improved Measurement Throughput

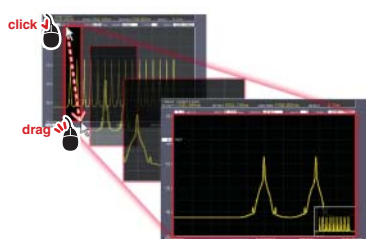
- 3x Sweep speed
- 10x GP-IB data transfer speed
- 100x Ethernet data transfer speed
(in comparison with AQ6317C Optical spectrum Analyzer)

Enhanced User Friendliness



USB interface

Supports mouse, keyboard, and external storage devices.



Trace zoom function

Enlarges a designated area

Specifications (extracts)

- Applicable fiber: SM (9.5/125 µm), GI (50/125 µm, 62.5/125 µm)
- Measurement wavelength range: 600 to 1700 nm
- Wavelength accuracy: ±0.02 nm (1520 to 1580 nm), ±0.04 nm (1450 to 1520 nm, 1580 to 1620 nm), ±0.1 nm (Full range)
- Measurement data point: 101 to 50001
- Level sensitivity:
-90 dBm (1300 to 1620 nm, resolution: 0.05nm or wider, sensitivity: HIGH3)
- Maximum input power: +20 dBm (Per channel, full span)
- Close-in dynamic range:
45 dB (±0.2 nm from peak at 1523 nm, resolution: 0.05 nm),
62 dB (±0.4 nm from peak at 1523 nm, resolution: 0.05 nm),
40 dB (±0.2 nm from peak at 1523 nm, resolution: 0.1 nm),
57 dB (±0.4 nm from peak at 1523 nm, resolution: 0.1 nm)
- Data storage: Internal memory and external (USB storage (memory/HDD))
- Printer: Built-in high-speed thermal printer (Factory option)
- Display: 10.4-inch color LCD (Resolution: 800 × 600)
- Power requirement: 100 to 240 VAC, 50/60Hz, approx. 150VA
- Dimensions and mass: Approx. 426 (W) × 221 (H) × 459 (D) mm, Approx. 27kg (without printer option)

Model Number and Suffix Code

Model	Suffix code	Description
735301		Optical Spectrum Analyzer AQ6370
Power Cord	-D	UL/CSA standard (UL3P)
	-F	VDE standard (CEE-C7)
	-G	SAA standard (SAA-3P)
	-Q	BS standard (BS3P Rectangular)
	-H	BS standard (BS3P Round)
	-M	HS standard (UL3P with 3P/2P converter)
Factory Installed Options	/FC	AQ9447 (FC) Connector adapter for optical input
	/SC	AQ9447 (SC) Connector adapter for optical input
	/ST	AQ9447 (ST) Connector adapter for optical input
	/RFC	AQ9441 (FC) Universal adapter for calibration output
	/RSC	AQ9441 (SC) Universal adapter for calibration output
	/RST	AQ9441 (ST) Universal adapter for calibration output
	/B5	Built-in thermal printer

AQ6370 Viewer Emulation/Remote Control Software (Optional)



Emulation function

- Exactly the same user interface and functions as AQ6370.
- Easy display and analyze waveform data.

Remote control function

- Allows you to control AQ6370 from anywhere on Ethernet networks.
- Real-time update gives you the sensation of operating on an actual unit.
- Applications: Troubleshooting in production lines, monitoring of long term tests in the lab.

A New-Generation Optical Spectrum Analyzer for High-Precision Ultra-DWDM Signal Analysis



Features

Best optical performance

- High wavelength accuracy: ± 10 pm
- High wavelength resolution: 10 pm
- High wavelength resolution accuracy: $\pm 2\%$
- Wide close-in dynamic range

Fast sweep and quick response

- Measurement time is as low as 1/5 compared to the conventional models (AQ6317 Series)*
 - Faster auto-ranging in all sensitivities
 - Quicker key response as measurement conditions change
- * Depends on measurement settings and input light condition.

User-friendly GUI and powerful functions

- Easy operation with mouse/keyboard
- Compatible with multiple interfaces (GP-IB, LAN, printer, etc.)
- Large data storage area and fast data transfer (FTP)
- Enhanced built-in applications

Specifications

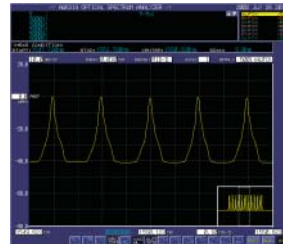
Applicable fiber	SM (9.5/125 μ m), GI (50/125 μ m)
Measurement wavelength range	600 to 1700 nm
Span	0.1 nm to full range and zero span
Wavelength repeatability ^{(1), (2), (3), (4)}	± 2 pm (1 min, or less, 1450 to 1620 nm)
Number of samplings	101 to 50001
Resolution bandwidth	0.01, 0.02, 0.05, 0.1, 0.2, 0.5 and 1 nm
Resolution accuracy ^{(1), (3), (4), (5)}	$\pm 2\%$ (RES.: 0.1 nm or wider, 1450 to 1620 nm) $\pm 2.5\%$ (RES.: 0.05 nm, 1450 to 1620 nm) $\pm 6\%$ (RES.: 0.02 nm, 1450 to 1620 nm)
Level linearity ^{(1), (3), (5), (7)}	± 0.05 dB (-50 to +10 dBm, RES.: 0.02 nm or wider, SENS.: HIGH 1 to 3)
Close-in dynamic range ^{(1), (5), (7), (9)}	40 dB (± 50 pm from peak at 1523 nm, RES.: 0.01 nm) 60 dB (± 100 pm from peak at 1523 nm, RES.: 0.01 nm) 70 dB (± 200 pm from peak at 1523 nm, RES.: 0.01 nm) 60 dB (± 200 pm from peak at 1523 nm, RES.: 0.01 nm)
Interface	Remote control
	Others
Power requirement	100 to 240 ($\pm 10\%$) V, 50/60 Hz, approx. 400 VA
Dimensions and mass ⁽¹⁰⁾	Approx. 425 (W) \times 222 (H) \times 500 (D) mm, 33 kg

Notes:

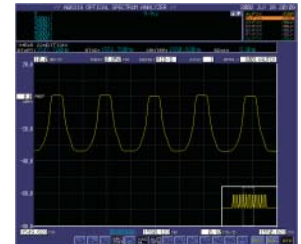
- 1) With 9.5/125 μ m SMF, after 1 hour warm-up, after optical alignment
- 2) At 15 to 30°C
- 3) At chop mode off
- 4) Horizontal scale: wavelength display mode
- 5) At 23 \pm 3°C
- 7) With applied input fiber Type B1.1 9.5/125 μ m SMF defined on IEC60793-2 (Mode field diameter: 9.5 μ m, NA: 0.104 to 0.107, PC polished), attenuation off, vertical scale: absolute power display mode
- 9) Sensitivity setting is HIGH3 and chop mode on
- 10) Except protector

Measurement Examples

25 GHz spacing DWDM signals
OSNR 40 dB (@Noise BW = 0.01 nm)



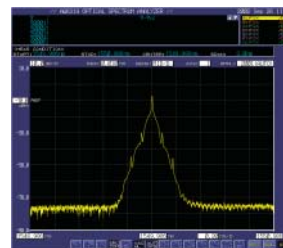
Wavelength resolution at 0.01 nm



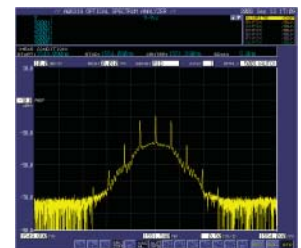
Wavelength resolution at 0.05 nm

The wide close-in dynamic range makes it possible to accurately measure OSNR of DWDM signals with 25 GHz (or narrower) spacing. Even at 0.05 nm resolution setting, ASE noise between channels can be measured flatly.

Modulated signal measurement



10 Gbps, NRZ, PRBS 2³¹, wavelength resolution at 0.01 nm



40 Gbps, RZ, PRBS 2¹⁷, wavelength resolution at 0.01 nm

With its high resolution and wide close-in dynamic range, a side-band at 10 Gbps or 40 Gbps modulated signal can be observed clearly.

Ordering Information

Model

Product name: AQ6319 Optical Spectrum Analyzer

Model: 810804600-□□□□

CE: CE marking

Power cord

D: UL/CSA standard (UL3P)

F: VDE standard (CEE-C7)

G: SAA standard (SAA-3P)

Q: BS standard (BS546 3P)

H: BS standard (BS 2P)

Fuse type

1: 5 A (AC 100 V to AC 120 V)

5: 3.15 A (AC 200 V to AC 240 V)

Accessory

Print paper (Roll type)

Parts No.: 955-990000320
(model name: TF50KS - E2)

High-Resolution
Reflectometer

AQ7410B

http://www.yokogawa.com/tm/optfiber/aq7410b/tm-aq7410b_01.htm

Precisely measures the reflection distribution within optical modules and devices (20 μm resolution & 2 m distance range)

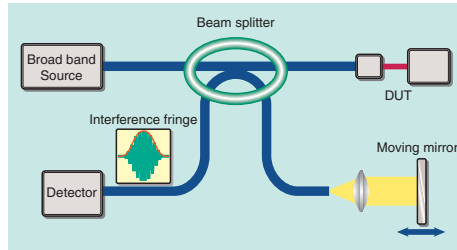


AQ7410B

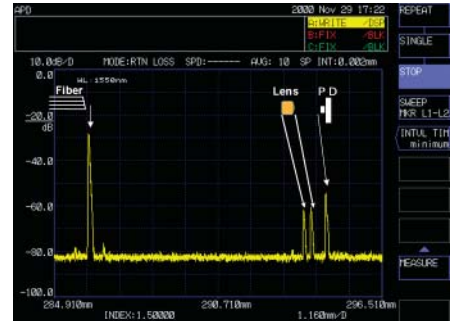
High-Resolution Reflectometer

The AQ7410B high-resolution reflectometer is a Michelson interferometer based instrument for measuring internal reflection of optical module and devices. With resolutions of 20 μm (AQ7413) and 65 μm (AQ7414), the AQ7410B offers the superior spatial analysis capability necessary for measuring multiple reflection points in optical modules and devices.

Principle



Measurement example



Reflection measurement of an optical receiver

Optical Spectrum
Analyzer

AQ6331

Portable Optical Spectrum Analyzer for DWDM Networks



AQ6331

Optical Spectrum Analyzer

The AQ6331 is a optical spectrum analyzer (OSA) offering the advanced performance required for DWDM network testing, in both C-band and L-band. The AQ6331 presents excellent wavelength resolution, with accuracy and dynamic range equal to a conventional bench top OSA for research and development applications.

White Light
Source

AQ4305

Broadband Light Source for testing passive devices and optical fibers



AQ4305

White Light Source

The AQ4305 is a high power broadband light source that uses a halogen lamp. The AQ4305 can measure wavelength dependent loss characteristics of optical devices and optical fibers in conjunction with an optical spectrum analyzer.

WDM Monitor
& Channel Monitor

WD300 & WD30

Reliable and High Performance Optical Monitor for WDM Networks



WD300 & WD30

WDM Monitor & Channel Monitor

The WDM monitor WD300 is a polychromator based optical system having no moving parts and features excellent long term reliability. The WD300 can accurately and quickly perform wavelength, optical power and OSNR measurements that are required for the telecommunication equipment application, and is suitable for monitoring of DWDM system with 50GHz and 100GHz channel spacing. The WD30, a miniaturized model, offers the best performance as a monitor of the RODAM applications.

Optical Fiber
Strain Analyzer

AQ8603

Monitoring the strain distribution along buildings and constructions



AQ8603

Optical Fiber Strain Analyzer

The AQ8603 is an optical fiber sensing system which can measure strain distribution in the optical fiber axial direction from one end by utilizing both Brillouin scattering light detecting technology and OTDR technology. The AQ8603 provides low cost monitoring in various structures and foundations such as architectural structures, civil engineering constructions, marine vessels, and aircraft.

Fiber Optic Distributed
Temperature Unit

AQ8920

Monitoring the temperature distribution along pipe lines and furnace



AQ8920

Fiber Optic Distributed Temperature Unit

The AQ8920 is an optical fiber temperature distribution measuring instrument using Raman spectroscopy and OTDR technology, and can measure the temperature distribution along a fiber from one end. The AQ8920 provides low cost solutions in various plant applications such as the temperature monitoring of pipeline and furnace and the fire detection.

FBG Sensor
Monitor

FB200

High speed monitoring of temperature, strain, and pressure.



FB200

FBG Sensor Monitor

The FB200 is a FBG monitor that uses an Optical Fiber Bragg Grating (FBG) as a sensor and measures the changes of temperature, strain and pressure as a wavelength shift. The FB200 can quickly measure multiple FBG sensors deployed along a fiber. Its small, light and reliable design is ideal for constant monitoring.

Optical Power Meter

TB200

<http://www.yokogawa.com/tm/TB200/>

Supports All Blue, Red and Near Infrared Wavelength Bands



TB200

Optical Power Meter

- Sufficient margin provided by 18 mm dia. sized photo-receiving surface even at high NA (0.85)
- Influence of multiple reflection alleviated by low-reflectivity sensor surface
- High-power measurement up to 100 mW
- Measurement interval of about 100 msec
- Full remote control enabled by standard USB interface

TB200 Specifications

Power Meter Unit

- Display resolution
0.01 dB (When W unit is selected, floating point 4 digits past decimal point)
- Unit Display
Absolute value: dBm, mW, μ W, nW
Incremental value: dB
- Measurement Interval
Approx. 100 msec
- Interface
USB (type B)
- Power supply
AC adapter (rated input voltage: 100 to 240 V) 7 VA
AA alkali dry cell (operation time: approx. 24 hours)

Power Sensor Unit

- Wavelength range
400 to 850 nm
- Light-receiving element
Si-PD
- Received light power range
1 μ W (-30 dBm) to 100 mW (+20 dBm)
- Max. light receiving level
+20 dBm (100 mW)
- Max. power density
5 mW/mm²

Multimedia Display Tester

3298F

<http://www.yokogawa.com/tm/3298F/>

Luminance, Contrast, Flicker and Chromaticity Measurements All with Just one Device



3298F

Multimedia Display Tester

- Luminance, contrast, flicker and chromaticity measurements
- Digital and bar graph indications
- Shading cylinder type optical system
- Luminance measurement range of 0.01 to 40,000 cd/m²
- Memory for measured data from 200 displays
- GO/NO-GO determination functions
- User-specified color calibration coefficients
- Light source color calibration coefficients
- Easy operation
- Compact and lightweight
- Battery-driven

3298F Specifications

- Luminance measurement range
0.01 to 40,000 cd/m²
- Luminance measurement range settings
400.0/4,000/40,000 cd/m²
- Luminance measurement precision
 $\pm 4\%$ of indicated value + $\pm 0.035\%$ of full-scale value
- Spectral responsivity
Approximates CIE 1931 color matching functions
- Color system
Chromaticity coordinates: (x, y, L) or (u', v', L)
Tristimulus values: (X, Y, Z) or (R, G, B) or (RGB ratio)
Correlated color temperatures: (T_c, duv, L')
- Chromaticity precision (deviation in x and y values)
 ± 0.002 or less, for type A standard light source (at 23 \pm 3°C, 70% RH or less, and luminance of at least 2% of the set range's full-scale value)
 ± 0.03 or less, for combination of type A standard light source/three-wavelength fluorescent lamp + color filters (at 23 \pm 3°C, 70% RH or less, and luminance of at least 1% of the set range's full-scale value)
- External dimensions
Sensor dimensions: approx. 67 (W) \times 150 (H) \times 40 (D) mm; tester dimensions: Approx. 107 (W) \times 176 (H) \times 55 (D) mm
- weight
Approx. 1 kg
- Power supply
Four AA batteries or optional AC adapter

Light Measurement Data Management Software

329831

http://www.yokogawa.com/tm/optical/329831/tm-329831_01.htm

For Multimedia Display Tester 3298/3298F



329831

Light Measurement Data Management Software

This light measurement data management software downloads measurements from a multimedia display tester (3298/3298F) to a PC and displays data tables, chromaticity diagrams, deviation charts, and trend graphs. The program can also read data stored in the display tester's memory.

- The program can be used to display data for each measurement parameter in table format and save the data to text files.
- A graphing function provides easy-to-understand graphical displays of luminance and chromaticity measurements according to the particular management application.
- Diagrams such as chromaticity diagrams can be copied and pasted to other Windows programs using the Windows clipboard.
- Diagrams such as chromaticity diagrams can be printed out as hard copies.
- Setting parameters can be saved to files.
- Memory data can be loaded into tables.

329831 Specifications

Functions

- Data table (measurement data)
Displays data for each measurement parameter in table format. Any of the available parameters can be selected for display.
- Trend graph
Displays trends for luminance, flicker, and chromaticity. The number of measurements is shown on the horizontal axis.
- Chromaticity diagram
Displays chromaticity measurements (x, y/u', v' table color system) in graph format. The screen size of the chromaticity diagram can be switched between two different sizes. Three different plot modes are available: refresh, trace, and scatter.
- Deviation chart
Up to six reference colors can be set for chromaticity measurements. Reference colors can be input numerically or through measurements. Three different plot modes are available: refresh, trace, and scatter.
- Surface distribution graph
Displays deviations for luminance and chromaticity according to position (color irregularity).
- The graphical part of any graph or chart can be copied to the clipboard as a bitmap.
- The graphical part of any graph or chart can be printed.
- File saving
Information shown in a data table can be saved in text format.
- Settings
Various coefficients can be set (color correction coefficient, etc.).
- Memory data
Specified parameters in memory can be displayed in data tables.

System Specifications

PC: PC with a Pentium 133 MHz or faster and at least 32 MB RAM, running Windows98/NT/2000. The PC should have a serial port conforming to the RS-232 standard. Screen: 640 \times 480 resolution, 256 or more colors (65,000 or more colors recommended).
Multimedia displaytester:
3298F (model: 329802) ROM Version 1.00 or later
3298 (model: 329801) ROM Version 1.05 or later

Wireless Communication
Tester

VC3300

<http://www.yokogawa.com/tm/VC3300/>

Saves Time, Money and Space for Testing and Programming



Features

- High-end tester class performance
 - Good power accuracy
 - Typical test items are measured: approx. 0.2s
- 3 test mode for each usage
 - TxRx mode for component calibration (No signaling)
 - Manual mode for radio characteristics test (With signaling)
 - Scenario mode for automatic Go/No-Go test (With signaling)
- Support multiple wireless system
GSM/GPRS/EDGE/WCDMA/HSDPA
- Function test item: Call processing, Voice loop back, TV loop back, Emergency call, Frequency handover, System handover (WCDMA to GSM)
- Compact design and light weight

Specification

- Frequency band
GSM900/DCS1800, GSM850/PCS1900
WCDMA (I, II, III, IV, V, VI, VIII, IX)
- Downlink transmission power: -120dBm to -10dBm
- Uplink reception power:
Measurement range:
-70dBm to +35dBm (WCDMA)
-40dBm to +35dBm (GSM)

Model	Suffix code	Description
733020		VC3300 Main frame
Power Cable	-D	UL and CSA
	-F	VDE
	-Q	BS
	-R	AS
Options	-H	GB
	/G*1	GSM test software pre-install
	/E*1	GSM/GPRS/EDGE test software pre-install
	/W*1	WCDMA test software pre-install
	/HD1*1	WCDMA/HSDPA test software pre-install
	/C1	GPiB interface

Model	Description
733021	GSM Test software
733022	WCDMA Test software
733023	GSM/GPRS/EDGE Test software
733025	WCDMA/HSDPA Test software
733026	HSDPA Test software
733065-E02	TEST-USIM card

*1 Either option should be selected

WCDMA/GSM
Mobile Phone Tester

VC200 Series

<http://www.yokogawa.com/tm/VC200/>

Shield box with
an antenna coupler

VC-SHIELD

High C/P 2G/3G Mobile Phone Testing



GSM

Model 733013 and 733015 GSM Test Functions

- Call Processing
- Frequency Handover
- Power Measurement
- Phase and Frequency Error
- Rx Quality
- Rx Level
- Loop Back BER/FER
- Burst Timing
- Voice Loop Back

GSM Band

GSM850, P-GSM, E-GSM, R-GSM, DCS1800, PCS1900

WCDMA

Model 733014 and 733015 W-CDMA Test Functions

- Call Processing
- Frequency Handover
- Maximum Output Power Measurement
- Minimum Output Power Measurement
- Open Loop Power Control
- Inner Loop Power Control
- EVM/Frequency Error
- Reference Sensitivity (BER)
- Maximum Input Power (BER)
- Voice Loop Back

Model & Suffix Code

Model	Suffix code	Description
733013		VC210 GSM tester
733014		VC220 WCDMA tester
733015		VC230 GSM/WCDMA tester
Power Cable	-D	UL and CSA
	-F	VDE
	-Q	BS
	-R	AS
	-H	GB
Connector type	-T	T type RF connector
	-N	N type RF connector



733062

VC-SHIELD Shield Box

- Including the phone fixture
- Frequency Range: 800MHz to 2500MHz
- Shield Characteristics: < -60dB
- RF Cable Interface:
External RF Connector type N
Internal RF Connector type SMA

Model	Suffix code	Description
733062		VC-SHIELD Shield box

Baseband Signal Generator

VB8300

<http://www.yokogawa.com/tm/VB8300/>

The Most Advanced IQ Baseband Signal Generator with High Sampling Clock Rate and Multi-channels



Features

- High speed sampling clock: Max. 300 MHz
- Long memory: Max. 128 M points/Ch
- Multi-channels: Max. 8 channels
- High resolution: 14 bits D/A Converter
- Sequence function
- Digital output (Option)
- Analog summing output and sequence trigger (Option)

Model and Suffix Code

Model	Suffix code	Description
703155		VB8300 Baseband Signal Analyzer
	-0642	2 ch (1 Output, Differential output), 64 M Points Memory
	-1282	2 ch (1 Output, Differential output), 128 M Points Memory
	-0644	4 ch (2 Output, Differential output), 64 M Points Memory
	-1284	4 ch (2 Output, Differential output), 128 M Points Memory
	-0648	8 ch (4 Output, Single-ended output), 64 M Points Memory
	-1288	8 ch (4 Output, Single-ended output), 128 M Points Memory
Power Cable	-D	UL_CSA Standard
	-F	VDE Standard
	-Q	BS Standard
	-R	AS Standard
	-H	GB Standard
Options	/D2	2 ch Digital Output (for 703155-0642 or 703155-1282)
	/D4	4 ch Digital Output (for 703155-0644 or 703155-1284)
	/D8	8 ch Digital Output (for 703155-0648 or 703155-1288)
	/AT	Analog Summing Out, Sequence Trigger

Signal Generation Software

Software	Model	Note
Digital Modulation Signal Generation Software	703081	up to 256 QAM
OFDM Generation Utility software	703082	IEEE802.11a/g/j/p OFDM
CCK Generation Utility	703084	IEEE802.11b/g CCK
Multi-path Utilities	703087	Multi-path fading
WCDMA Waveform Data Generation Utility (for 3GPP Release 6)	703185	WCDMA (HSDPA/HSUPA)
Multi-Format OFDM Signal Generation Utility	703074	IEEE802.16-2004
DVB-T/H Signal Generation option	703060	Needs 703074
IEEE802.16e OFDMA Signal Generation option	703062	Needs 703074

Wideband Modulation Analyzer

VN7100

<http://www.yokogawa.com/tm/VN7100/>

Revolutional Wideband Modulation Analyzer with Outstanding Performance



Features

- Input Frequency Range: IQ Input -84 MHz to 84 MHz, IF Input DC to 84 MHz
- Maximum Analysis Bandwidth: IQ 168 MHz, IF 84 MHz
- Ultra Long Memory: 128 M points
- Time and Frequency Domain Analysis
- WLAN (802.11a/b/g/j/p) Modulation Analysis (Option)

Model and Suffix Code

Model	Suffix code	Description
703260		VN7100 Wideband Modulation Analyzer
Power Cable	-D	UL_CSA Standard
	-F	VDE Standard
	-Q	BS Standard
	-R	AS Standard
	-H	GB Standard
Options	/WLAN	WLAN (IEEE802.11a/b/g/j/p) Modulation Analysis Pre-install
	/EQ	Equalization Filter Pre-install

Signal Analysis Software

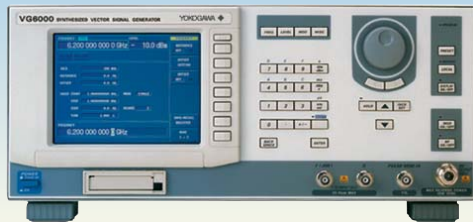
Software	Model	Note
Equalization Filter	703261	Add on to VN7100
Wireless LAN Modulation Analysis Software	703262	Add on to VN7100
		IEEE802.11a/b/g/j/p
Multi-Format OFDM Signal Analysis Utility	703073	IEEE802.16-2004
DTV Signal Analysis option	703061	Needs 703073
		ISDB-T, DVB-T/H
IEEE802.16e OFDMA Signal Analysis option	703063	Needs 703073

Synthesized Vector Signal Generator

VG3000E/VG6000

http://www.yokogawa.com/tm/wireless/vg6000/tm-vg6000_01.htm

A wide-band Signal Generator with an Arbitrary Waveform Generating Function that Builds the Future of Mobile Communications.



• Output Level	VG3000E	VG6000
< 2GHz	-115dBm to +13dBm	-115dBm to +10dBm
2GHz to 3.2GHz	-115dBm to +10dBm	-115dBm to +5dBm
4.96GHz to 6.2GHz	—	-115dBm to 0dBm

Model and Suffix Code

Model	Suffix code	Description
703220		VG3000E Synthesized Vector Signal Generator
703230		VG6000 Synthesized Vector Signal Generator
Power Cable	-D	UL, CSA Standard
	-F	VDE Standard
	-S	BS Standard
	-R	SAA Standard
	-H	GB Standard
Options	/HS	High Stability Time Base
	/AG1	Arbitrary Waveform Generator Function (16M points memory)
	/AG2	Arbitrary Waveform Generator Function (64M points memory)

VG3000E/VG6000

Synthesized Vector Signal Generator

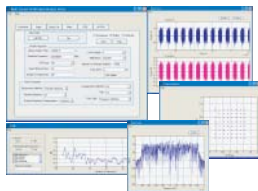
- Frequency Range: 250kHz to 3.2GHz (VG3000E) 250kHz to 3.2GHz, 4.96GHz to 6.2GHz (VG6000)
- Modulation Frequency bandwidth: 120MHz (-3dB) AWG function (option): Max 64M points memory / 100MHz clock

Wireless Data Generation & Analysis Utility

703185/703082/703084/703074 703062/703073/703063

http://www.yokogawa.com/tm/wireless/vbvgvnsoft/tm-vbvgvnsoft_01.htm

Multi-Format OFDM Signal Analysis



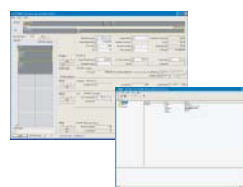
For VN7100

703073

Multi-Format OFDM Signal Analysis Utility

- Training sequence, pilot pattern, modulation format of sub carriers, and other OFDM modulation parameters can be defined.
- Non-standardized OFDM modulation signals can be analyzed by the utility using user definition files.
- Supported standards: IEEE802.11a, IEEE802.16-2004 OFDM PHY

IEEE802.16e-2005 OFDMA PHY Signal Generation



For VB8300, VG3000E /AG□, VG6000 /AG□

703062

IEEE802.16e OFDMA Signal Generation Option

- Add on software for 703074.
- Support TDD/FDD signals.
 - Automatically generate DL-MAP and/or UL-MAP message.
 - Automatic allocation of zone / burst.
 - Supported zones are DL-PUSC, DL-FUSC, UL-PUSC.

WCDMA 3GPP Release 6 Compliance



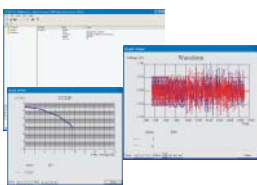
For VB8300, VG3000E /AG□, VG6000 /AG□

703185

WCDMA Signal Generation Utility for 3GPP Release 6

- Max. 256 channels multiplexed
- HSUPA support (up to 960kbps/user)
- HSDPA support
- Uplink: DPDCH, DPCCCH, HS-DPCCH, PRACH, Compressed DPDCH, Compressed DPCCCH, E-DPDCH, E-DPCCH
- Downlink: P-CCPCH, P-SCH,S-SCH, S-CCPCH, CPICH, DPCH, PICH, HS-PDSCH, HS-SCCH, AICH, Compressed DPCH, E-AGCH, E-RGCH, E-HICH, F-DPCH, Compressed F-DPCH, MICH

Multi-Format OFDM Signal Generation



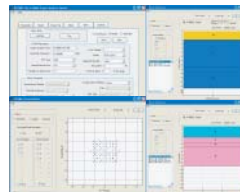
For VB8300, VG3000E /AG□, VG6000 /AG□

703074

Multi-Format OFDM Signal Generation Utility

- Training sequence, pilot pattern, modulation format of sub carriers, and other OFDM modulation parameters can be defined.
- Non-standardized OFDM modulation signals can be generated by the utility using user definition files.
- Supported standards: IEEE802.11a, IEEE802.16-2004 OFDM PHY

IEEE802.16e-2005 OFDMA PHY Signal Analysis



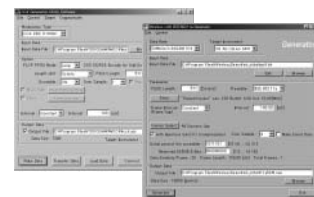
For VN7100

703063

IEEE802.16e OFDMA Signal Analysis Option

- Add on software for 703073.
- Decode UL-MAP and/or UL-MAP to determine sub carrier modulation and burst/zone mapping.
 - Supported zones are DL-PUSC, DL-FUSC, UL-PUSC.
 - Analysis function: EVM, Zone/Burst Structure, CCDF, Spectrum, Bit Error Rate (BER) before vitabi decoder, and others.

IEEE802.11a/b/g/j/p Compliance







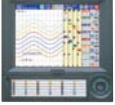


For VB8300, VG3000E /AG□, VG6000 /AG□

703082/703084






CCK Generation Utility Software (703084) OFDM Generation Utility Software (703082)







- IEEE802.11a/g/j/p OFDM generation (703082)
- Modulation Type: BPSK/QPSK/16QAM/64QAM
- Framing/Add Preamble/Insert Interval
- IEEE802.11b/g CCK generation (703084)
- Modulation Type: DBPSK/DQPSK/CCK
- PLCP PPDU Mode: Long/Short

Recorders Panel mount type







Model	DX1000	DX2000	DX1000N	DX100P	DX200P	CX1000	CX2000
Item							
Series	DAQSTATION	DAQSTATION	DAQSTATION	DAQSTATION	DAQSTATION	DAQSTATION	DAQSTATION
Models	DX1002/DX1004/DX1006/DX1012	DX2004/DX2008/DX2010/DX2020/DX2030/DX2040/DX2048	DX1002N/DX1004N/DX1006N/DX1012N	DX102P/DX104P/DX106P/DX112P	DX204P/DX208P/DX210P/DX220P/DX230P	CX1000/CX1006/CX1200/CX1206	CX2000/CX2010/CX2020/CX2200/CX2210/CX2220/CX2410/CX2420/CX2610/CX2620
Recorder type	Paperless	Paperless	Paperless	Paperless	Paperless	Paperless	Paperless
Number of inputs	2/4/6/12ch	4/8/10/20/30/40/48ch	2/4/6/12ch	2/4/6/12ch	4/8/10/20/30ch	0/6ch	0/10/20ch
Display	5.5 inch TFT color LCD	10.4 inch TFT color LCD	5.5 inch TFT color LCD	5.5 inch TFT color LCD	10.4 inch TFT color LCD	5.5 inch TFT color LCD	10.4 inch TFT color LCD
Max measurement interval	25 ms or 125 ms	25 ms or 125 ms	25 ms or 125 ms	125 ms or 1 s	125 ms or 1 s	1 s	1 s
Controlled points	-	-	-	-	-	Up to 2	Up to 6
Types of measurement inputs	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI
Chart speed	-	-	-	-	-	-	-
Alarm	4 levels/CH	4 levels/CH	4 levels/CH	4 levels/CH	4 levels/CH	4 levels/CH	4 levels/CH
Number or alarm relay outputs	Up to 6 (optional)	Up to 24 (optional)	Up to 6 (optional)	Up to 6 (optional)	Up to 24 (optional)	Up to 6 (optional)	Up to 6 (optional)
Internal memory	80 MB or 200 MB (Flash memory)	80 MB or 200 MB (Flash memory)	80 MB or 200 MB (Flash memory)	5 MB (Flash memory)	5 MB (Flash memory)	1.2 MB (Flash memory)	1.2 MB (Flash memory)
External media	CF card	CF card	CF card	Zip disk, CF card	Zip disk, CF card	3.5-inch floppy disk, Zip disk, CF card	3.5-inch floppy disk, Zip disk, CF card
Standard communication interface	Ethernet	Ethernet	Ethernet	Ethernet	Ethernet	Ethernet	Ethernet
Optional communication interface	RS232 or RS-422/485	RS232 or RS-422/485	RS232 or RS-422/485	RS232 or RS-422/485	RS232 or RS-422/485	RS232 or RS-422/485	RS232 or RS-422/485
Environmental worthiness	IP65/NEMA4 0 to 50°C	IP65/NEMA4 0 to 50°C	IP65/NEMA4 0 to 50°C	IP65/NEMA4 0 to 50°C (5 to 40°C when Zip drive operation)	IP65/NEMA4 0 to 50°C (5 to 40°C when Zip drive operation)	IP65/NEMA4 0 to 50°C (5 to 40°C, if a floppy disk or Zip drive is in operation)	IP65/NEMA4 0 to 50°C (5 to 40°C, if a floppy disk or Zip drive is in operation)
Power supply	90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC
Dimensions W×H×D (mm)	144×144×228.5	288×288×226	144×144×258.5	144×144×218	288×288×220	144×144×223.6	288×288×225.5

Recorders Desktop type

Model	MV1000	MV2000	DR130	DR231	DR232
Item					
Series	MVAdvanced	MVAdvanced	DARWIN	DARWIN	DARWIN
Models	MV1004, MV1006, MV1008, MV1012, MV1024	MV2008, MV2010, MV2020, MV2030, MV2040, MV2048	DR130	DR231	DR232
Recorder type	Paperless	Paperless	Chart	Chart	Chart
Number of inputs	4/6/8/12/24 ch	8/10/20/30/40/48 ch	Max. 20 ch	Max. 30 ch	Max. 300 ch
Display	5.5inch TFT color LCD	10.4inch TFT color LCD	VFD	VFD	VFD
Max measurement interval	25 ms or 125 ms	25 ms or 125 ms	2 s	2 s	500 ms
Controlled points	-	-	-	-	-
Types of measurement inputs	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI, strain, mA, pulse, Power monitor
Chart speed	-	-	1 to 1500 mm/h (1 mm step)	1 to 1500 mm/h (1 mm step)	1 to 1500 mm/h (1 mm step)
Alarm	4 levels/ch	4 levels/ch	4 levels/ch	4 levels/ch	4 levels/ch
Number or alarm relay outputs	Up to 6 (optional)	Up to 12 (optional)	Up to 10 (optional)	Up to 10 (optional)	Alarm contact output option (10 CH) required
Internal memory	80 MB (standard) 200 MB (large)	80 MB (standard) 200 MB (large)	512 KB (optional)	512 KB (optional)	512 KB (optional)
External media	CF card or USB memory	CF card or USB memory	3.5-inch floppy disk	3.5-inch floppy disk	3.5-inch floppy disk
Standard communication interface	Ethernet	Ethernet	-	-	-
Optional communication interface	RS232 or RS-422/485	RS232 or RS-422/485	Ethernet, RS232, or GP-IB	Ethernet, RS232, RS422A/485, or GP-IB modules	Ethernet, RS232, RS422A/485, or GP-IB modules
Environmental worthiness	0 to 40°C	0 to 40°C	0 to 50°C (5 to 40°C when Floppy disk operation)	0 to 50°C (5 to 40°C when Floppy disk operation)	0 to 50°C (5 to 40°C when Floppy disk operation)
Power supply	90 to 132 or 180 to 264 VAC, 10.0 to 28.8 VDC	90 to 132 or 180 to 264 VAC, 10.0 to 28.8 VDC	90 to 250 VAC, 10 to 32 VDC	90 to 250 VAC, 10 to 32 VDC	90 to 250 VAC, 10 to 32 VDC
Dimensions W×H×D (mm)	189×173×258	281×273×260	338×221×335	438×291×336	438×291×301

					
µR10000	µR10000	µR20000	µR20000	DARWIN	DARWIN
436101, 436102, 436103, 436104	436106	437101, 437102, 437103, 437104	437106, 437112, 437118, 437124	DR241	DR242
100 mm pen type	100 mm dot type	180 mm pen type	180 mm dot type	250 mm type	250 mm type
Chart	Chart	Chart	Chart	Chart	Chart
1/2/3/4ch	6ch	1/2/3/4ch	6/12/18/24ch	Max. 30ch	Max. 300ch
VFD	VFD	VFD	VFD	VFD	VFD
125 ms	1 s	125 ms	1 s or 2.5 s	2 s	500 ms
–	–	–	–	–	–
DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI, strain, mA, Pulse, Power monitor
5 to 12000 mm/h (82 increments)	1 to 1500 mm/h (1 mm step)	5 to 12000 mm/h (82 increments)	1 to 1500 mm/h (1 mm step)	1 to 1500 mm/h (1 mm step)	1 to 1500 mm/h (1 mm step)
4 levels/CH	4 levels/CH	4 levels/CH	4 levels/CH	4 levels/CH	4 levels/CH
Up to 6 (optional)	Up to 6 (optional)	Up to 12 (optional)	Up to 24 (optional)	Up to 10 (optional)	Alarm contact output option (10 CH) required
–	–	–	–	512 KB (optional)	512 KB (optional)
–	–	–	–	3.5-inch floppy disk	3.5-inch floppy disk
–	–	–	–	–	–
RS-422/485, or Ethernet	RS-422/485, or Ethernet	RS-422/485, or Ethernet	RS-422/485, or Ethernet	Ethernet, RS232, RS422/485 GP-IB	Ethernet, RS232, RS422/485, or GP-IB modules
IP54 0 to 50°C	IP54 0 to 50°C	IP54 0 to 50°C	IP54 0 to 50°C	0 to 50°C (5 to 40°C when Floppy disk operation)	0 to 50°C subunit: -10 to 60 °C (5 to 40°C when Floppy disk operation)
90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC	90 to 250 VAC	90 to 250 VAC
144×144×220	144×144×220	288×288×220	288×288×220	444×284×343	444×284×308

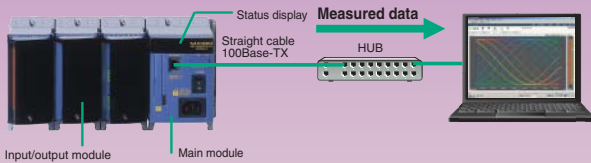
Module type

Model	MW100	MX100	DA100-1	DA100-2	DC100-1	DC100-2
Item						
Series	DAQMASTER	DAQMASTER	DARWIN	DARWIN	DARWIN	DARWIN
Models	MW100	MX100	DA100-1	DA100-2	DC100-1	DC100-2
	Stand-alone model	PC measurement unit	Stand-alone model	Expandable model	Stand-alone model	Expandable model
Recorder type	Paperless	Paperless	Paperless	Paperless	Paperless	Paperless
Number of inputs	Max. 60 ch/unit	Max. 1200ch (20 units)	Max. 40 ch	Max. 300 ch	Max. 40 ch	Max. 300 ch
Display	–	–	–	–	VFD	VFD
Max measurement interval	10 ms	10 ms	500 ms	500 ms	500 ms	500 ms
Controlled points	–	–	–	–	–	–
Types of measurement inputs	DCV, TC, RTD, DI, strain, mA, pulse	DCV, TC, RTD, DI, strain, mA, pulse	DCV, TC, RTD, DI, strain, mA, pulse, Power monitor	DCV, TC, RTD, DI, strain, mA, pulse, Power monitor	DCV, TC, RTD, DI, strain, mA, pulse, Power monitor	DCV, TC, RTD, DI, strain, mA, pulse, Power monitor
Chart speed	–	–	–	–	–	–
Alarm	4 levels/ch	2 levels/ch	4 levels/ch	4 levels/ch	4 levels/ch	4 levels/ch
Number or alarm relay outputs	DO module (10 CH) required	DO module (10 CH) required	Alarm contact output option (10 CH) required	Alarm contact output option (10 CH) required	Alarm contact output option (10 CH) required	Alarm contact output option (10 CH) required
Internal memory	–	–	–	–	1 MB, 2 MB, or 4 MB	1 MB, 2 MB, or 4 MB
External media	CF Card (Max 2 GB, optional)	CF Card (Max 2 GB, optional)	–	–	3.5-inch floppy disk	3.5-inch floppy disk
Standard communication interface	Ethernet (Modbus/TCP)	Ethernet	–	–	–	–
Optional communication interface	RS232, RS-422/485, or CANBus	–	Ethernet, RS232, RS422/485, or GP-IB modules	Ethernet, RS232, RS422/485, or GP-IB modules	Ethernet, RS232, RS422/485, or GP-IB modules	Ethernet, RS232, RS422/485, or GP-IB modules
Environmental worthiness	-20 to 60°C	0 to 50°C	0 to 50°C	0 to 50°C (subunit: -10 to 60°C)	5 to 40°C	5 to 40°C (subunit: 0 to 60°C)
Power supply	90 to 250 VAC, 10 to 32 VDC	90 to 250 VAC	90 to 250 VAC, 10 to 32 VDC	90 to 250 VAC, 10 to 32 VDC	90 to 250 VAC, 10 to 32 VDC	90 to 250 VAC, 10 to 32 VDC
Dimensions W×H×D (mm)	455×131×159	442×131×159	422×176×100	336×165×100	338×236×157	338×236×157

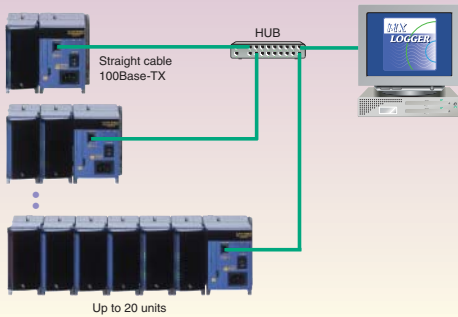
Get Your System Set Up Quickly, from Desktop Measurement to Large-scale Data Logging



Connection between a single MX unit and a single PC
(measurement of 24 channels/10 ms or 60 channels/100 ms)



Connection between multiple MX units and a single PC



Overview

With its modular configuration that offers flexible scalability, the MX100 platform enables you to construct the optimal data logging system for your measuring environment with the freedom of high speed Ethernet, minimal wiring, and lack of constraints with regard to wiring distance. The MX gets you up and running in a short amount of time with a highly reliable, real time data logging system that meets your requirements for R&D, durability testing, quality assurance, and facilities monitoring.

Features

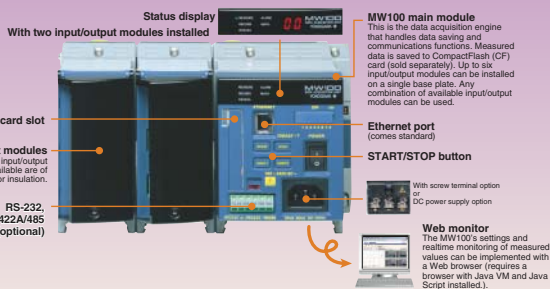
Maximum Performance...

- High-Speed, Multi-Channel Capability, High withstand Voltage
- Shortest measurement interval of 10 ms (high-speed measurement of 10 ms on 24 channels or 100 ms on 60 channels is possible).
- Possible to acquire data from up to 1,200 channels (when using Yokogawa's proprietary software).
- Reinforced insulation between the input terminal and the case handles 3700 Vrms for one minute, or 600 Vrms/VDC continuous.
- Multi-Interval Measurement
- Mixed use of three types of measurement intervals is enabled within the system (measurement intervals are set for each module).

Ease of Use...

- Flexible System Configuration
- By configuring modules, a system can be built or modified to utilize 4 to 1,200 channels, and measurement intervals of 10 ms to 60 s.
- Versatile PC-Based Software Options
- Software developed by Yokogawa, an API, and a LabVIEW driver are available.
- Easy Software Setup
- PC software developed by Yokogawa automatically identifies any connected MX100s.
- No Re-Wiring between Measurements
- A removable terminal unit is available.

Combined Web Browser Monitoring and Data Logging of Plant and Equipment Data



Features

Anytime, Anyplace...

- In a wide range of temperatures: -20 to 60°C^{1,2,3,4}
- Reinforced insulation: Between input terminal and case⁵, 3700 Vrms (one minute) or 600 Vrms/VDC (continuous)
- A wide variety of network functions: HTTP, FTP, DHCP, SNMP, E-mail, and others.
- DC power supply (12 V-28 V) option available.

Smart Logging...

- High speed measurement with a single unit (10 channels/10 ms or 60 channels/100 ms); Shortest measurement interval of 10 ms
- Multi-interval: Enables mixing of three different measurement intervals in a single unit (measurement intervals can be set for each module)
- Supports CompactFlash (CF) cards⁶ of up to 2 GB
- Continuous data acquisition is possible on 60 channels at 100 ms for approximately ten days with a 2-GB card, or for three months on 60 channels at 1 s.
- MATH function on the main module available with the /M1 option.
- Collective data acquisition on 360 channels (via Modbus with the /M1 option)

1. The operating temperature range for the input modules and main module. The operating temperature range of the output modules is -20 to 50°C.
2. Note that the power cord supplied with the main module differs depending on the operating temperature range (see the specifications on page 7). If the operating temperature range specification of the supplied standard power cord does not meet your requirements, we recommend that you select a screw-type terminal rather than the plug type for the main module power inlet, and supply your own power input cable.
3. The operating temperature range of the AC adapter used with DC power supplies is 0 to 40°C.
4. Please consult with a representative for applications involving temperatures below -20°C.
5. The withstand voltage value with the MX110 input module. For the withstand voltage values of other input and output modules, please refer to the specifications for those modules (GS 04M10B01-01E).
6. CF card not included (sold separately).

Overview

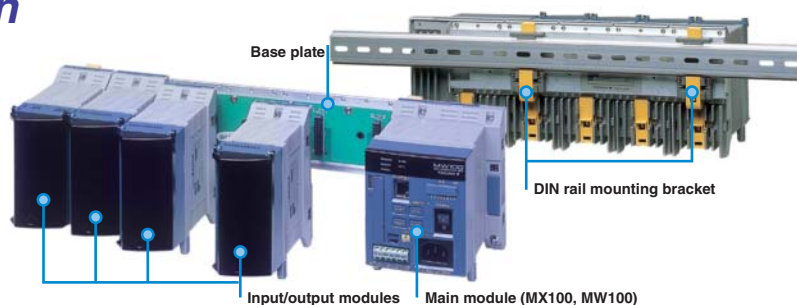
With your web browser, access any number of MW100s within a plant or installed on equipment to see real-time site conditions and equipment operating statuses. The functionality of the Web browser allows you to share information from multiple locations, and construct highly distributed remote monitoring/data acquisitions systems that are ideal for facilities management and equipment monitoring.

DAQMASTER



System Configuration

The MX can be configured for your specific measurement needs by combining the main module, input/output modules, and a base plate. Assembled units can be used as-is on the desktop, or can be rack-or panel-mounted with provided DIN rails (DIN rail mounting brackets come standard with the MX150).



Input Modules

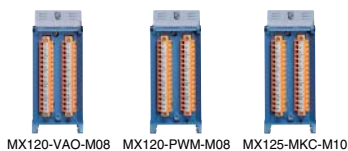
MX100 and MW100



Name	Model	Number of channels	Shortest measurement interval	Description
Universal Input Modules	MX110-UNV-H04	4	10 ms	DC voltage, thermocouple, 3-wire RTD, DI (non-voltage contact, Level (5 V logic)). Mixed input allowed.
	MX110-UNV-M10	10	100 ms	DC voltage, thermocouple, 3-wire RTD, DI (non-voltage contact, Level (5 V logic)). Mixed input allowed.
	MX110-VTD-L30	30	500ms	DC voltage, thermocouple, DI (non-voltage contact, Level (5 V logic)). Mixed input allowed.
4-Wire RTD and Resistance Input Module	MX110-V4R-M06	6	100 ms	DC voltage, 4-wire RTD, 4-wire resistance, DI(non-voltage contact, Level (5 V logic)). Mixed input allowed.
Strain Input Modules	MX112-B12-M04	4	100 ms	Built-in bridge resistance of 120 Ω
	MX112-B35-M04			Built-in bridge resistance of 350 Ω
	MX112-NDI-M04			For connection with an external bridge head and strain gauge type sensor (NDIS connector)
Pulse Input Module	MX114-PLS-M10	10		Non-voltage contact, open collector, and Level (5 V logic). Mixed input allowed. 10 kpulse/s
5 V Digital Input Module	MX115-D05-H10	10	10 ms	Non-voltage contact, open collector, and Level (5 V logic). Mixed input allowed.
24 V Digital Input Module	MX115-D24-H10	10	10 ms	Level (24 V logic), Vth = 12 V

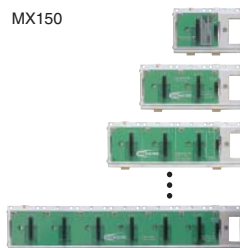
Output Modules

MX100 and MW100



Name	Model	Number of channels	Output update interval	Description
Analog Output Module	MX120-VAO-M08	8	100 ms	Allows mixed voltage (± 10 V) and current (4-20 mA) output
PWM Output Module	MX120-PWM-M08	8	100 ms	Pulse width modulation output module
Digital Output Module	MX125-MKC-M10	10	100 ms	"A" contact (SPST)

Base Plate



Base plates available for mounting the various MX100/MW100 I/O modules.

No. of slots	Model
1	MX150-1
2	MX150-2
3	MX150-3
4	MX150-4
5	MX150-5
6	MX150-6

Accessories



- Connector Cover
Connector cover for open slots
- AC Adapter (772075)
AC adapter for the DC power model.
Operating temperature range: 0 to 40°C

Removable Terminal Plate/Connector

Input/output module's terminal plate can be removed, making wiring easier (NDIS strain: excluding MX112-NDI-M04)



Model	Description
772061	Used in combination with the external M4 screw terminal block, RJC (reference junction compensation), and 772062. Applies to MX110-UNV-M10, MX115-D□□-H10
772062	Used in combination with the input module -M4 screw terminal block connection cable and 772061. Applies to MX110-UNV-M10 and MX115-D□□-H10
772063	Plate with clamp terminals (with RJC), applies to MX110-UNV-M10 and MX115-D□□-H10
772064	Clamp terminal, applies to MX110-UNV-H04
772065	Clamp terminal, applies to MX120-VAO-M08, MX120-PWM-M08, and MX125-MKC-M10
772067	Plate with clamp terminals, applies to MX110-V4R-M06
772068	Plate with clamp terminals with 120 Ω built in bridge resistance, applies to MX112-B□□-M04
772069	Plate with clamp terminal with 350 Ω built in bridge resistance, applies to MX112-B□□-M04
772080	Plate with M3 screw terminals (with RJC), applies to MX110-UNV-M10 and MX115-D□□-H10
772081	Plate with clamp terminal for current with 10 Ω built in bridge resistance, applies to MX110-UNV-M10
772082	Plate with clamp terminal for current with 100 Ω built in bridge resistance, applies to MX110-UNV-M10
772083	Plate with clamp terminal for current with 250 Ω built in bridge resistance, applies to MX110-UNV-M10

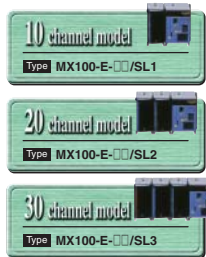
Recorders

DAQMASTER
Quick Start Package

MX100 MW100

PC-based Data Acquisition System

DAQMASTER



MX100

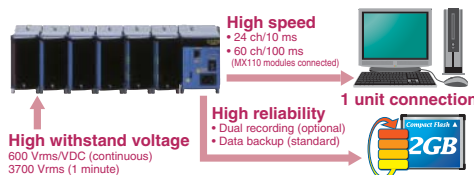
Quick Start Package

Simple! Compact Size! Ready to Run!
Fast set up- attach sensors, connect to your network, load software, and you are ready to measure and record data

- Universal inputs (DCV/TC/RTD/DI)
- 100 ms scan speed
- Multi-interval measurement and logging
- Trending and logging software with historical viewer included

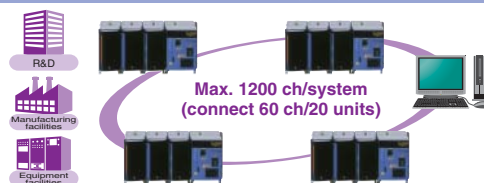
Model	Suffix Code	Description
MX100		Main module
Software language	-E	English (with MX100 standard software)
Supply voltage	-1	100 VAC-240 VAC
Power supply inlet and power supply cord	<input type="checkbox"/>	Power supply code
Options	/DS	Dual save function
Quick Start Package	/SL1	10 ch Quick Start Package
	/SL2	20 ch Quick Start Package
	/SL3	30 ch Quick Start Package

Single Unit Data Logging



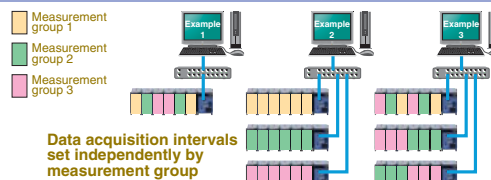
MXStandard software (comes standard with the MX100) is designed for connections to a single unit, and is ideal for small-scale data acquisition at 24 ch/10 ms or 60 ch/100 ms.
The main unit is equipped with a CF card that adds to the reliability of your acquisition system by backing up data upon communication disconnections, and through the Dual recording function (optional).

Multi Unit Data Logging



With MXLOGGER (sold separately), you can quickly set up a large-scale data acquisition system of up to 1200 ch/20 units with no programming required.
Equipped with high speed Ethernet communication (100Base-TX), enables creation of flexible measuring systems without the constraints of total cable length and connection formats.

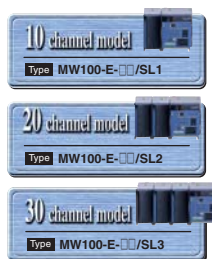
Multi Interval Data Logging



By assigning input modules to one of three measurement groups, you can set measuring intervals for signals from transients to temperature on a group-by-group basis.
Through separate waveform observation by measurement group, you can easily find correlations in waveform changes and identify trends, improving efficiency of analysis of phenomena

Web-enabled Data Acquisition and Data Logging System

DAQMASTER



MW100

Quick Start Package

Simple! Compact Size! Ready to Run!
Fast set up- attach sensors, connect to your network, configure with your web browser, and you are ready to measure and record data- no special software needed. Built-in data logging to high capacity Compact Flash media

- Real-time data monitoring with a web browser
- Universal inputs (DCV/TC/RTD/DI)
- 100 ms scan speed
- Multi-interval measurement and logging to high capacity CompactFlash media
- Email messaging and file transfer via FTP

Model	Suffix Code	Added Specifications Code	Description
MW100			Main module *1, 2
Language	-E		English (comes with MW100 Viewer Software)
Supply voltage	-1		100 VAC-240 VAC
	-2		12 to 28 VDC, with AC adapter *3
	-3		12 to 28 VDC, without AC adapter *4
Power input type and power supply cord	<input type="checkbox"/>		Power supply code
Options	/C2		RS-232 communication interface *5, 6
	/C3		RS-422-A/485 communication interface *5, 6
	/M1		MATH functions *6, 7
Quick Start Package	/SL1		10 ch Quick Start Package
	/SL2		20 ch Quick Start Package
	/SL3		30 ch Quick Start Package

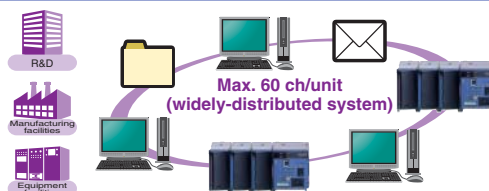
*1 CF (compact flash) card not included. *2 Modbus/TCP function comes standard. *3 "W" cannot be selected with "-2". *4 With "-3, only W (screw terminal) can be selected. *5 /C2 and /C3 cannot be selected together. *6 /C2 or /C3 must be selected when using the Modbus/RTU slave function. Also, /M1 must be selected for use of the Modbus/RTU master function. *7 /M1 must be selected when using the Modbus/TCP client function.

On-Demand, Remote Measuring System



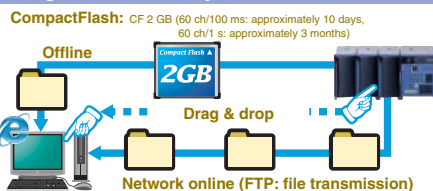
Point a Web browser to URL of the MW100, access the MW100 at the site, and browse any data, any time.
From changing settings to Starting/Stopping data acquisition, the MW100 is easy to operate with a familiar, Web browser interface.

Multi-User & Multi-Access



Use measuring and networking technology to share a broad range of data from the field and access multiple facilities simultaneously with a Web browser to check on the status of equipment.
Comes with DHCP (automatic IP address assignment) and SNTP (time correction function) for connections with Modbus-compatible instruments (requires the /M1 MATH option on the client side)

Long Duration Memory & File Transmission



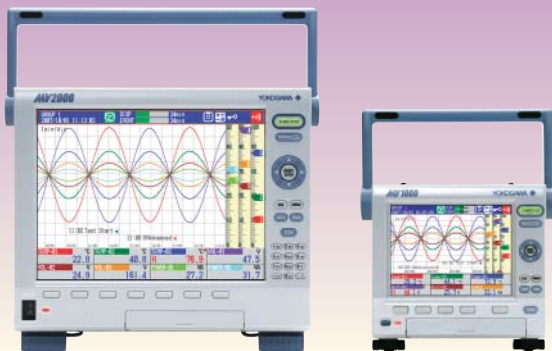
Point a Web browser to URL of the MW100 to send MW100 data files with drag-and-drop ease
Files can be sent automatically as they are created, or manually transferred with the CF card in the main unit

MVAdvanced

MV1000/MV2000

Powerful & Portable Data Acquisition Stations

MVAdvanced™



Features

- Multi-channel universal inputs **Best-in Class**
 MV1000: up to 24 input channels
 MV2000: up to 48 input channels
- Secure, high capacity memory **Best-in Class**
 Internal memory: 200 MB
 (Example: Save 12 channels of data every second for about 75 days!)
 Choice of CompactFlash and USB removable storage media
- Removable input terminals simplify field wiring
- Lightweight aluminum construction (MV2000)
- Choice of secure binary or versatile text data file formats
- Advanced network connectivity with Email, file transfer, and web server functions.

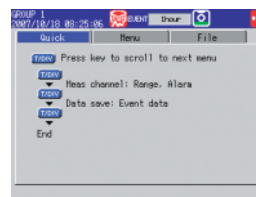
Standard Universal Inputs With The Capacity You Need

MV1000: up to 24 input channels, MV2000: up to 48 input channels MV2000 is expandable to 348 channels (48 local plus 300 external) using optional external data acquisition hardware Measures thermocouples, RTD, DI, and almost any DC voltage sensor.



Fast Setup And Multilingual Menus

Quick setting menu the system is ready to measure after visiting three menus. USB port attach a PC keyboard for setup or use a memory device to transfer setting files and data between a PC and MVAdvanced. Multilingual menus, supporting Chinese, English, French, German, Japanese, and Korean languages.



Large Memory

Up to 200 MB of secure, non-volatile flash memory is used for real-time data storage. Saved data is retained during power outages of any duration, and the MVAdvanced automatically resumes measurement and storage immediately after power is restored. CompactFlash removable media stores archived data files for convenient transport to your PC environment.

Example of saving data to internal memory*

MVAdvanced Standard memory	Approx. 30 days	*Condition •Sampling interval: 1 sec •Measurement channel: 12 ch •Binary save mode
MVAdvanced Large memory	Approx. 75 days	

Removable Input Terminals

Plug-in connectors attach quickly to your wiring and enhance portability. Extra connectors are a low cost accessory.



Text File Format

MVAdvanced can save data files in a .txt text file format, which allows a wide range of common software applications to readily open and access your test data. For data security, a binary file format can also be used.

MV1000/MV2000 Specifications

Models and Input Capacity

Input channels and measurement interval

Model	Type	Measurement Interval*
MV1000	MV1004 (4 channels), MV1008 (8 channels)	125 ms (25 ms)
	MV1006 (6 channels), MV1012 (12 channels), MV1024 (24 channels)	1 s (125 ms)
	MV2008 (8 channels)	125 ms (25 ms)
MV2000	MV2010 (10 channels), MV2020 (20 channels), MV2030 (30 channels), MV2040 (40 channels), MV2048 (48 channels)	1 s (125 ms)

* Numbers in parentheses are when in high-speed mode.

Memory

Internal memory

Capacity: standard: 80 MB
 large: 200 MB

Removable Storage Media

Type: Compactflash (CF) memory card, USB memory
 Capacity: Up to 2 GB (32 MB CF card included)
 Format: FAT16 or FAT32

Software

Includes configuration and file viewer and conversion PC software

Dimensions

MV1000: 189 (W) × 177 (H) × 259 (D) mm
 MV2000: 307 (W) × 273 (H) × 260 (D) mm

Weight

MV1000: approximately 3.5 kg
 MV2000: approximately 5.6 kg

Intelligent Pen Recorders



LR12000E
Multipen Laboratory Recorder

- Ten- or twelve-pen models
- Universal input of voltages, thermocouples, or RTDs
- Crisp, color recording and a wealth of printing functions
- High reliability owing to non-contact technologies
- IC memory card (standard), floppy disk drive (optional)

LR12000E Specifications

- Operating method: digital servo
- Number of channels: 10 or 12
- Input mode: guarded floating input
- Measurement accuracy: 0.05% of reading + 0.03% of range + 1.0 μ V (for 1 mV or more)
- Measuring range: 0.1 mV to 200 V FS (high sensitivity model), 12 types of thermocouples, and RTDs
- Measurement cycle: 135 Hz at fastest
- Chart speed: 10 to 600 mm/h or mm/min
- Chart paper: effective recording width of 250 mm; fan-folded, 30 m long
- Recording pen: disposable felt-pen
- Pen gap: about 3.5 mm, provided with phase synchronization function as standard
- Printing: wire dot, ink-ribbon (monochromatic)
- Display: fluorescent display tube (5 by 7 dots); 6 lines with 20 characters each
- Display contents: digital values, bar graph and range
- Memory: IC card slot (standard), floppy disk drive (optional)
- Power supply: AC
- Option: remote control, 12 alarm point output, communication (via GP-IB or RS-232C), floppy disk drive
- Dimension: Approx. 438 (W) \times 266 (H) \times 434 (D) mm
- Weight: Approx. 20 kg (for 12 pens)



LR8100E
Laboratory Recorder

- Four-, six-, or eight-pen model
- Universal input of voltages, thermocouples, or RTDs
- Crisp, color recording and a wealth of printing functions
- High reliability owing to non-contact technologies
- IC memory card (standard), floppy disk drive (optional)

LR8100E Specifications

- Operating method: digital servo
- Number of channels: 4, 6 or 8
- Input mode: guarded floating input
- Measurement accuracy: 0.05% of reading + 0.03% of range + 1.0 μ V (for 1 mV or more)
- Measuring range: 0.1 mV to 200 V FS (high sensitivity model), 12 types of thermocouples, and RTDs
- Measurement cycle: 135 Hz at fastest
- Chart speed: 10 to 1200 mm/h or mm/min
- Chart paper: effective recording width of 250 mm; fan-folded, 30 m long
- Recording pen: disposable felt-pen
- Pen gap: about 4 mm, provided with phase synchronization function as standard
- Printing: wire dot, ink-ribbon (monochromatic)
- Display: fluorescent display tube (5 by 7 dots); 8 lines with 20 characters each
- Display contents: digital values, bar graph and range
- Memory: IC card slot (standard), floppy disk drive (optional)
- Power supply: AC or DC (optional)
- Option: remote control, 8 alarm point output, communication (via GP-IB or RS-232C), floppy disk drive, computation, 10 to 32 V DC drive
- Dimension: Approx. 438 (W) \times 266 (H) \times 310 (D) mm
- Weight: Approx. 16 kg (for 8 pens)

CE*: Except the -/B model

Intelligent Pen Recorders



LR4100E
Laboratory Recorder

- One-, two-, three-, or four-pen model
- Universal input of voltages, thermocouples, or RTDs
- Crisp, color recording and a wealth of printing functions
- High reliability owing to non-contact technologies
- IC memory card (standard), floppy disk drive (optional)

LR4100E Specifications

- Operating method: digital servo
- Number of channels: 1, 2, 3, or 4
- Input mode: guarded floating input
- Measurement accuracy: 0.05% of reading + 0.03% of range + 1.0 μ V (for 1 mV or more voltage range)
- Measuring range: 0.1 mV to 200 V FS (high sensitivity model), 12 types of thermocouples, and RTDs
- Measurement cycle: 135 Hz at fastest
- Chart speed: 10 to 1200 mm/h or mm/min
- Chart paper: effective recording width of 250 mm; fan-folded, 20 m long
- Recording pen: disposable felt-pen
- Pen gap: about 4 mm, provided with phase synchronization function as standard
- Printing: wire dot, ink-ribbon (monochromatic)
- Display: fluorescent display tube (5 by 7 dots); 4 lines with 20 characters each
- Display contents: digital values, bar graph and range
- Memory: IC card slot (standard), floppy disk drive (optional)
- Power supply: AC or DC (optional)
- Option: remote control, 4 alarm point output, communication (via GP-IB or RS-232C), floppy disk drive, computation, 10 to 32 V DC drive
- Dimension: Approx. 438 (W) \times 199 (H) \times 323 (D) mm
- Weight: Approx. 14 kg (for 4 pens)



LR4200E
Flat-Bed Laboratory Recorder

- One-, two-, three-, or four-pen model
- Universal input of voltages, thermocouples, or RTDs
- Crisp, color recording and a wealth of printing functions
- High reliability owing to non-contact technologies
- IC memory card (standard)

LR4200E Specifications

- Operating method: digital servo
- Number of channels: 1, 2, 3, or 4
- Input mode: guarded floating input
- Measurement accuracy: 0.05% of reading + 0.03% of range + 1.0 μ V (for 1 mV or more)
- Measuring range: 0.1 mV to 200 V FS (high sensitivity model), 12 types of thermocouples, and RTDs
- Measurement cycle: 135 Hz at fastest
- Chart speed: 10 to 1200 mm/h or mm/min
- Chart paper: effective recording width of 250 mm; fan-folded, 20 m long
- Recording pen: disposable felt-pen
- Pen gap: about 4 mm, provided with phase synchronization function as standard
- Printing: wire dot, ink-ribbon (monochromatic)
- Display: fluorescent display tube (5 by 7 dots); 4 lines with 20 characters each
- Display contents: digital values, bar graph and range
- Memory: IC card slot (standard)
- Power supply: AC
- Option: remote control, 4 alarm point output, communication (via GP-IB or RS-232C), computation, roll chart, re-roll function
- Dimension: Approx. 448 (W) \times 455 (D) \times 185 (H) mm
- Weight: Approx. 14 kg (with 4 pens)

CE*: Except the -/B model

CE*: Except the -/B model

Data Acquisition Unit

DA100

http://www.yokogawa.com/ns/daq/daq-index_daq.htm

PC-Based Data Acquisition Unit




DA100

Data Acquisition Unit

The DA100 data acquisition unit provides a data acquisition environment that is expandable and has a high level of design freedom, using a PC as the user interface.

- High level of design freedom
The DA100 is available as a small standalone model capable of data acquisition on as many as 40 channels, and an expandable model that can be expanded up to 300 channels directly by the user.
- Networking capability
The DA100 can be equipped with an Ethernet (10BASE-T) port so you can build a simple network or connect to an on-premises LAN for remote data acquisition and centralized data management.
- PC-friendly
The included data logging software makes it easy to create a PC-based data acquisition environment.
- High-speed, high-precision measurements
The DA100 is capable of high-speed, high-precision measurements with a scanning speed of 300 channels per 500 ms.
- Wide variety of I/O modules
A wide variety of input modules are available, including voltage, temperature (thermocouple, RTD), contact, distortion, pulse, power monitor, and mA (DC current). The large array of modules also includes a communication module and alarm output module.
- An economically sensible choice
Remote measurement at distances up to 500 meters reduces wiring requirements, and the unit's small size helps you save space.

DA100 Specifications (some specifications are for separately sold options)

Inputs:

- Expandable/changeable at the individual module level
- Standalone model: 10 to 40 channels
- Expandable model: 10 to 300 channels

Input types:

- DC voltage (± 20 mV to ± 50 V), thermocouples (R, S, B, K, E, J, T, N, W, L, U), RTD, mA, pulse, power monitor, strain, DI, etc.

Communication standards: GP-IB, RS-232-C, RS422A/485, Ethernet

Remote measurement (expandable model):

- Maximum total distance using special cables: 500 meters
- Maximum number of connected subunits: 6

Measurement interval: 0.5–60 seconds

Integration time: 50 ms, 60 ms, 100 ms

Other: Alarm output

Options: Computation function, report computation function

PC software: DAQ 32Plus, DAQLOGGER

Dimension:

- Standalone: Approx. 422 (W) \times 176 (H) \times 100 (D) mm
- Expandable model: Approx. 336 (W) \times 165 (H) \times 100 (D) mm
- Subunit: Approx. 422 (W) \times 176 (H) \times 100 (D) mm

Weight: Approx. 4 kg (with module attached)

Data Collector

DC100

http://www.yokogawa.com/ns/daq/daq-index_daq.htm

Data Collector




DC100

Data Collector

The DC100 is a data collector that lets you monitor various I/O signals using many different display functions on a large monitor, while saving the data to internal memory. With its large memory capacity, a single DC100 unit can meet a variety of user needs, such as mobility in terms of ease of handling in the field and portability; environmental durability with a PC-free, chart-free design; and economics in terms of effective use of measurement data and superior cost performance.

- Support for efficient data processing
With its large memory capacity (specify 1 MB, 2 MB, or 4 MB of internal memory when placing your order), the DC100 enables efficient data acquisition. You can even transfer data to a PC while simultaneously backing up to internal memory. The DC100 comes standard with a 3.5-inch floppy drive, and an optional SCSI interface is available.
- Superior mobility
With a lightweight (approximately 5 kg)*, compact (approximately 20 cm depth) design, the DC100 is ideal for vehicle installations or use as a portable data collector. (*With 40-channel input module attached to DC100 main unit.)
- Tremendous function expandability
The DC100 gives you the flexibility to change and expand your configuration, from a small-scale 10-channel standalone unit up to a large-scale 300-channel data acquisition system. A variety of input types are available, including DC voltage, temperature (thermocouple, RTD), contacts, power monitor, pulse, strain, and DC current (mA).
- High-speed, high-precision measurements
The DC100 is capable of high-speed, high-precision measurements with a maximum scanning speed of 500 ms for all channels.
- Networking capability
The DC100 can be equipped with an Ethernet (10BASE-T) port so you can build a simple network or connect to an on-premises LAN for remote data acquisition and centralized data management.

DC100 Specifications (some specifications are for separately sold options)

Input channels:

- Standalone model: 10 to 40 channels
- Expandable model: 10 to 300 channels

Measurement interval: 0.5–60 seconds

A/D integration time: 20 ms (50 Hz), 16.7 ms (60 Hz), 100 ms (10 Hz)

Input types: DC voltage, thermocouples, RTD, mA, pulse, power monitor, strain, DI

Communication standards: GP-IB, RS-232-C, RS422A/485, Ethernet

Communication standards: GP-IB, RS-232-C, RS422A/485, Ethernet

Other: Alarm output, remote functions

Internal memory capacity:

- 1 MB standard; 2 MB or 4 MB available as options (specify when ordering)
- External storage media: 3.5-inch floppy drive (standard), optional SCSI interface

Remote measurement (expandable model):

- Maximum total distance using special cables: 500 meters
- Maximum number of connected subunits: 6

PC software: DAQ 32Plus, DAQLOGGER

Dimension:

- DC100 main unit: Approx. 338 (W) \times 236 (H) \times 157 (D) mm
- Subunit: Approx. 422 (W) \times 176 (H) \times 100 (D) mm

Weight: Approx. 5.3 kg (with module attached)

Portable Hybrid Recorder

DR130http://www.yokogawa.com/ns/daq/daq-index_darwin.htm**Portable Hybrid Recorder****DARWIN****DR130****Portable Hybrid Recorder**

The DR130 portable hybrid recorder has superior mobility and functionality with advanced functions and high reliability packed into a compact body weighing less than 10 kg. The included floppy drive makes it easy to exchange data with a PC.

- Small, lightweight, and portable
The DR130's overall size and weight have been reduced compared to older models. It can be used in building a simple network or connected to a LAN to support remote data acquisition and centralized data management.
- Networking capability
The DR130 can be equipped with an Ethernet (10BASE-T) port so you can build a simple network or connect to an on-premises LAN for remote data acquisition and centralized data management.
- Floppy drive for saving data
Settings and measurement data can be saved to the floppy drive. Measurement data is saved via the included 512 KB of SRAM for better reliability. The included 32Plus data acquisition software lets you convert measurements to Excel and Lotus 1-2-3 formats.
- PC-friendly
Powerful PC software makes it easy to create a PC-based data acquisition environment.
- Universal input
The input unit, which isolates each channel, has a built-in signal conditioner function that enables universal measurement of a variety of inputs (voltage, thermocouple, RTD, contacts).

DR130 Specifications (some specifications are for separately sold options)

Inputs: 10 or 20 channels (specify when ordering)
 Input types: DC voltage, thermocouple, RTD, DI
 Communication standards: GP-IB, RS-232, Ethernet
 Measurement interval: 2–60 seconds
 Recording interval: Minimum 2 seconds
 Recording specifications: 10-color dot recording, 150 mm effective recording width
 Display: VFD 5 × 7 dot matrix, 3-line display
 Memory: 3.5-inch floppy drive with 512 KB SRAM
 Options:
 Computation function, alarm output, remote function, power monitor, report computation function
 PC software:
 DAQ 32Plus, DAQLOGGER
 Dimension: Approx. 338 (W) × 221 (H) × 335 (D) mm
 Weight: Approx. 9.3 kg

Hybrid Recorder

DR230http://www.yokogawa.com/ns/daq/daq-index_darwin.htm**Hybrid Recorder****DARWIN****DR230****Hybrid Recorder**

- The DR230 hybrid recorder provides excellent function expandability and design freedom as an R&D tool for all industries, for applications ranging from small-scale data logging up to multi-point data collection.
- Superior design freedom
The DR230 provides flexibility to change or expand from small-scale data logging up to multi-point data collection. The DR230 is available as a simple 30-channel (maximum) standalone model and an expandable model that can be expanded from 10 to 300 channels directly by the user.
- Networking capability
The DR230 can be equipped with an Ethernet (10BASE-T) port so you can build a simple network or connect to an on-premises LAN for remote data acquisition and centralized data management.
- An economically sensible choice
Remote measurement at distances up to 500 meters reduces wiring requirements, and the unit's small size helps you save space.
- High-speed, high-precision measurements
The DR230 is capable of high-speed, high-precision measurements with a scanning speed of 300 channels per 500 ms.
- PC-friendly
You can easily create a PC-based data acquisition environment. In addition, a floppy drive can be added.
- Wide variety of I/O modules
A wide variety of input modules are available, including voltage, temperature (thermocouple, RTD), contact, strain, pulse, power monitor, and mA (DC current). The large array of modules also includes a communication module and alarm output module.

DR230 Specifications (some specifications are for separately sold options)

Inputs:
 Standalone model: 10, 20, or 30 channels (specify when ordering)
 Expandable model: 10 to 300 channels (can be expanded or changed)
 Input types: DC voltage, thermocouples, RTD, mA, pulse, power monitor, distortion, DI
 Communication standards: GP-IB, RS-232-C, RS422A/485, Ethernet
 Other: Alarm output, remote function
 Remote measurement (expandable model):
 Maximum total distance using special cables: 500 meters
 Maximum number of connected subunits: 6
 Measurement interval: 0.5 second (expandable model) to 60 seconds (measurement interval range for standalone model starts at 2 seconds)
 Recording interval: Minimum 2 seconds
 Recording specifications: 10-color dot recording, 250 mm effective recording width
 Display: VFD 5 × 7 dot matrix, 3-line display
 Memory: 3.5-inch floppy drive with 512 KB SRAM
 Options: Computation function, report computation function
 PC software: DAQ 32Plus, DAQLOGGER
 Dimension:
 Standalone: Approx. 438 (W) × 291 (H) × 336 (D) mm
 Expandable model: Approx. 438 (W) × 291 (H) × 301 (D) mm
 Subunit: Approx. 422 (W) × 176 (H) × 100 (D) mm
 Weight: Approx. 13 kg (with module attached)

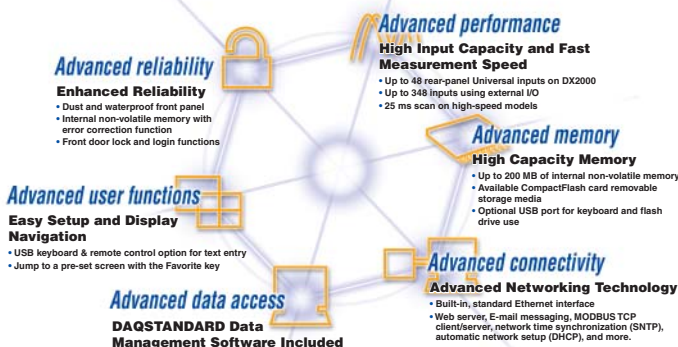
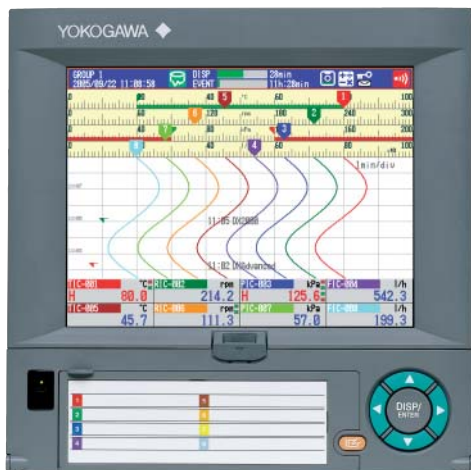
Introducing the New DX Series
(Data Acquisition Station)

DX1000/DX2000

<http://www.daqstation.com>

Evolved to the Next Generation Daqstation!!

DXAdvanced R2



Introducing New Functions for Firmware R2 (Release 2)

The following are the main functions added with DXAdvanced R2

- MW100 Automatic Assignment Function (DX2000/MC1 Option)
- Media FIFO Function
- Other improved operability



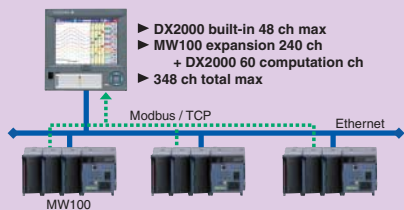
Large Memory

Max 200 MB of flash memory can be installed as internal memory
Max 2GB of CF card can be installed as removable memory



DX2000 (200MB)	
Display update (min/div)	30 min/div
Save interval (sec)	60 sec
Total sample time	Approx.1085 days

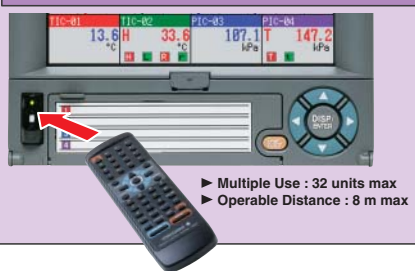
High Expandability Utilizing External Input



Versatile Display Function

- Overview display
- Scale bar graph display
- Split trend display

Infrared Remote Control



USB Interface



DX1000/DX2000 Specifications

Inputs

Number of inputs:

- DX1000: 2, 4, 6, 12 channels
- DX2000: 4, 8, 10, 20, 30, 40, 48 channels

Measurement interval:

- DX1002, DX1004, DX2004, DX2008: 125 ms, 250 ms, 25 ms (fast sampling mode)
- DX1006, DX1012, DX2010, DX2020, DX2030, DX2040, DX2048: 1 s, 2 s, 5 s, 125 ms (fast sampling mode)

Inputs: Universal inputs

- DCV (20, 60, 200 mV, 2, 6, 20, 50 V, 1-5 V)
- TC (R, S, B, K, E, J, T, N, W, L, U, WRe)
- RTD (Pt100, JPt100)
- DI (Contact input, TTL level)
- DCA (With external shunt resistor attached)

Display

Display unit:

- DX1000: 5.5-inch TFT color LCD (320×240 pixels)
- DX2000: 10.4-inch TFT color LCD (640×480 pixels)

Data saving function

- External storage medium:
 - Medium: CompactFlash memory card (CF card)
- Internal memory:
 - Medium: Flash memory
 - Capacity: Selectable from 80 MB or 200 MB

Alarm function

- Number of alarm levels: Up to four levels for each channel
- Alarm types: High and low limits, differential high and low limits, high and low rate-of-change limits and delay high and low

Ethernet communication function

- Connection: Ethernet (10Base-T)
- Protocols: TCP, UDP, IP, ICMP, ARP, DHCP, HTTP, FTP, SMTP, SNTP, Modbus, DX private

Construction

- Front panel: Water and dust-proof (based of IEC529-IP65 and NEMA No.250 TYPE4*)
- *Except external icing test.

Dimensions:

- DX1000: 144(W)×144(H)×229(D)* mm *max.
- DX2000: 288(W)×288(H)×226(D)* mm *max.

All-in One Controller That Integrates Monitoring and Recording Functions



CX1000/CX2000

Control and Measurement Station

DAQSTATION CX1000/CX2000 have up to 6 embedded loops. CX is a control and measurement station to collect/display control data of up to 16 external Green series controllers. CX standard control operation screens allow to monitor control data. With a program control (option), CX realizes functional program operation.

- Using DAQSTATION CX as a Data Collector
DAQSTATION CX can record embedded loop data, measurement data, and external controller data. Control statuses and operation statuses can be recorded. It is easy to collect data for quality control and creating reports.
- Using DAQSTATION CX as a Control Terminal
DAQSTATION CX lets you control, monitor, and collect data from controllers in various locations. The screens needed for controller operation and monitoring are included as standard features. The user-friendly display function lets you set operation parameters for Green series units.
- Fewer Cables
Measurements from Green series units are transmitted to a DAQSTATION CX through an RS-485 interface. As all Green series controllers do not have to wire to CX, it can eliminate the need for individual twisted pair input wiring from the controller to CX.
- Network-Based Monitoring
DAQSTATION CX can be set to transmit an E-mail when a controller outputs an alarm. This lets you monitor for alarms even if you are not on site. In addition, the DAQSTATION CX screen can be displayed on any PC Web browser.
- Internet Functions
Standard Ethernet easily enables CX1000/CX2000 to be operated in existing LAN/WAN environment. The internet functions are E-mail notification, Web browser remote monitoring, and FTP file transfer.

CX1000/CX2000 Specifications

Display:	5.5-inch TFT color LCD (CX1000) 10.4-inch TFT color LCD (CX2000)
Control mode:	Single loop, cascade control, and loop control with PV switching.
Control computation functions:	Continuous PID control, relay ON/OFF control, time-proportionate PID control, overshoot control function (Super)
Control interval:	250, 500, 1000 ms
Number of control loop:	0, 2 (CX1000) 0, 2, 4, 6 (CX2000)
Measurement interval:	1, 2 seconds
Measurement channels:	0, 6 (CX1000) 0, 10, 20 (CX2000)
Universal output type:	4-20 mA current output/Voltage pulse/Relay contact output
Contact input:	6 points per each 2 loops
Open collector transistor output:	4 points per each 2 loops
Make contact relay output:	2 points per each 2 loops
Ethernet:	Standard feature
RS422A/485 or RS232:	Only one can be specified
Program control function:	Program patterns: 4 max (/PG1) or 30 max (/PG2) Segments: Max 99 per pattern Total segments: 300 max
External storage media:	Floppy disks, Zip disks, CompactFlash memory card
Number of connecting Green series controllers:	4 (CX1000) 16 (CX2000)
Ladder communication:	Available
Mathematical function:	12 channels (CX1000) 30 channels (CX2000)
Dimensions:	CX1000: 144 (W) × 144 (H) × 223 (D) mm CX2000: 288 (W) × 288 (H) × 225.5 (D) mm
Weight:	CX1000: Approx. 3.0 kg CX2000: Approx. 6.3 to 7.7 kg

Data Acquisition Station with Networking Capabilities



DX100/DX200

DAQSTATION

Yokogawa's DX Series of next-generation data acquisition stations go beyond conventional recorders to provide leading-edge networking functions and powerful information processing capabilities.

- Leading-edge networking functions
The DX100/DX200 are standard-equipped with an Ethernet port so you can immediately connect to an existing LAN or WAN. Networking functions such as email notifications, remote monitoring through a Web browser, and FTP file transfers are supported.
- A variety of display functions
The DX100/DX200 have wide-viewing-angle, high-resolution TFT color liquid crystal displays. The display size is 5.5 inches on the DX100 and 10.4 inches on the DX200. In addition to trend displays, the DX100/DX200 have a variety of other display functions, such as bar graph display, digital display, overview display, and past trend display.
- Flexible storage options
The DX100/DX200 support the following external storage media: 3.5-inch floppy drive (1.44 MB), CompactFlash memory card, Zip disk.
- Robust design for maximum reliability
Internal memory is flash memory, which does not require a battery backup. The case front has a dust-proof, drip-proof design, and conforms to the IEC529-IP65 standard and NEMA No. 250 TYPE4 (excluding icing test).
- Integration through application software
The application software can be used to enter settings whether the DX Series is online or offline, and to easily build networked systems for data monitoring, file transfer, data logging, etc. The DAQOPC (OPC server) interface package lets you interface your DX Series with other equipment and build network systems in a timely manner.

DX100/DX200 Specifications

Inputs:	2, 4, 6, or 12 channels (DX100) 4, 8, 10, 20, or 30 channels (DX200)
Input types:	DC voltage ± 20 mV to ± 50 V Thermocouples: R, S, B, K, E, J, T, N, W, L, and U RTD: Pt100, JPt100 Operation recording DC current (externally attached shunt resistor) * Any mix of inputs
Display:	5.5-inch TFT color liquid crystal display (DX100) 10.4-inch TFT color liquid crystal display (DX200)
External storage media:	Specify any of the following when placing your order: 3.5-inch floppy drive (1.44 MB) CompactFlash memory card Zip disk
Recording capacity:	Approximately 1 month on 6 channels (with no computation channel, at 60-second sampling interval) A variety of sampling intervals can be set.
Alarm types:	Upper and lower limits, delay upper and lower limits, difference upper and lower limits, change rate upper and lower limits
Option specifications:	Alarm output, RS-422A, RS-232, FOUNDATION™ Fieldbus communication function, remote control, FAIL/memory end output, computation/report function, batch function, 24 V DC transmitter power output, 24 V DC/AC power driving, VGA output (DX200), etc.
Dimensions:	DX100: 144 (W) × 144 (H) × 218 (D) mm DX200: 288 (W) × 288 (H) × 220 (D) mm
Weight:	DX100: Approx. 3.0 kg DX200: Approx. 6.6 to 7.3 kg

DAQSTATION
Pharmaceutical Models

DX100P/DX200P

http://www.yokogawa.com/ns/daq/daq-index_recorder.htm

Data Acquisition Station of 21 CFR Part 11 Compliant

Daqstation



DX100P/DX200P DAQSTATION

- Comply with the requirements of FDA regulation 21 CFR Part 11
 - Electronic recording standards are supported through the following capabilities: binary data saving, batch function, login function, and operation history saving.
 - Electronic signature standards are supported by the sign-in function and login function.
- Application software
 - Sign-in through DX100P/DX200P and through PC software.
 - Sign-in information is stored as attachments to measurement files to protect the security of the original data.
- Leading-edge networking functions

The DX100P/DX200P are standard-equipped with an Ethernet port so you can immediately connect to an existing LAN or WAN. Networking functions such as email notifications, remote monitoring through a Web browser, and FTP file transfers are supported.
- A variety of display functions

The DX100P/DX200P have wide-viewing-angle, high-resolution TFT color liquid crystal displays for superior screen clarity. In addition, they have a variety of display functions, including trend, bar graph, digital, and overview displays.
- Flexible storage options

The following storage media options can be selected according to your applications: CompactFlash memory card, Zip disk. In addition, a variety of file formats are supported, so you can efficiently save just the data you need. Because the DX Series do not use paper or ink for recording, efficiency is improved and total cost of ownership is reduced.
- Maximum reliability

Internal memory is flash memory, which does not require a battery backup. You can also back up data to multiple destinations through your network.

DX100P/DX200P Specifications

- Inputs: 2, 4, 6, or 12 channels (DX100P)
4, 8, 10, 20, or 30 channels (DX200P)
- Input types:
DC voltage (20 mV to 50 V), thermocouple, RTD, operation recording, DC current (externally attached shunt resistor)
* Any mix of inputs
- Contacts
- Display: 5.5-inch TFT color liquid crystal display (DX100P)
10.4-inch TFT color liquid crystal display (DX200P)
- External storage media: Specify any of the following when placing your order:
CompactFlash memory card
Zip disk
- Recording capacity:
Approximately 100 days on 6 channels (with no computation channel, at 60-second sampling interval)
A variety of sampling intervals can be set.
- Alarm types:
Upper and lower limits, delay upper and lower limits, difference upper and lower limits, change rate upper and lower limits
- Option specifications:
Alarm output, RS-422A, RS-232, FAIL/memory end output, computation/report function, remote control, 24 V DC transmitter power output, 24 V DC/AC power driving, VGA output (DX200P), etc.
- Dimensions: DX100P: 144 (W) × 144 (H) × 218 (D) mm
DX200P: 288 (W) × 288 (H) × 220 (D) mm
- Weight: DX100P: Approx. 3.0 kg
DX200P: Approx. 6.6 to 7.3 kg

Hybrid Recorder

DR240

http://www.yokogawa.com/ns/daq/daq-index_darwin.htm

Hybrid Recorder

DARWIN



DR240 Hybrid Recorder

The DR240 hybrid recorder is a panel-mounted industrial recorder equipped with a highly reliable, high breakdown solid-state relay developed by Yokogawa. This recorder has excellent environmental durability and is ideal for process monitor applications.

- Environmental durability you can rely on

The DR240 provides the environmental durability and reliability you need for applications in harsh field environments. The input scanner unit contains a surface-mounted high breakdown solid-state relay developed by Yokogawa. This feature helps significantly reduce the unit's size while improving reliability.
- Superior design freedom

The DR240 is available as a simple 30-channel (maximum) standalone model and an expandable model that can be expanded from 10 to 300 channels in the field.
- Networking capability

The DR240 can be equipped with an Ethernet (10BASE-T) port so you can build a simple network or connect to an on-premises LAN for remote data acquisition and centralized data management.
- An economically sensible choice

Remote measurement at distances up to 500 meters reduces wiring requirements, and the unit's small size helps you save space.
- PC-friendly

You can easily create a PC-based data acquisition environment. In addition, a floppy drive can be added.
- Wide variety of I/O modules

A wide variety of input modules are available, including voltage, temperature (thermocouple, RTD), contact, strain, pulse, power monitor, and mA (DC current). The large array of modules also includes a communication module and alarm output module.

DR240 Specifications (some specifications are for separately sold options)

- Inputs:
Standalone model: 10, 20, or 30 channels (specify when ordering)
Expandable model: 10 to 300 channels (can be expanded or changed)
- Input types: DC voltage, thermocouples, RTD, mA, pulse, power monitor, strain, DI
- Communication standards: GP-IB, RS-232-C, RS422A/485, Ethernet
- Other: Alarm output, remote function
- Remote measurement (expandable model):
Maximum total distance using special cables: 500 meters
Maximum number of connected subunits: 6
- Measurement interval:
0.5 second (expandable model) to 60 seconds (measurement interval range for standalone model starts at 2 seconds)
- Recording interval: Minimum 2 seconds
- Recording specifications: 10-color dot recording, 250 mm effective recording width
- Display: VFD 5 × 7 dot matrix, 3-line display
- Memory: 3.5-inch floppy drive with 512 KB SRAM
- Options: Computation function, report computation function
- PC software: DAQ 32Plus, DAQLOGGER
- Dimension:
Standalone: Approx. 444 (W) × 288 (H) × 343 (D) mm
Expandable model: Approx. 444 (W) × 288 (H) × 308 (D) mm
Subunit: Approx. 422 (W) × 176 (H) × 100 (D) mm
Weight: Approx. 16 kg (with module attached)

Leading Edge Chart Recorder “Easier to Acquire, Easier to Read”



μR10000

Intelligent Industrial Recorder (100 mm recording chart)

μR10000 has carried over μR series high reliability and basic functions. The 101 × 16 full-dot matrix display allows it to monitor various on-site data.

- High reliability and high quality
 - Fully contact-less technology
 - High degree of integration using custom IC
 - Light weight (2.5 kg for 6 dot-model)
 - Dust and splash proof front door
- Variety of line-up
 - 1 to 4 pen model, 6 dot model
- Variety of input types
 - Universal inputs
 - Many input sensors available (35 input types such as Pt50, PR20-40 etc)
- Superior ease-of-operation
 - VFD 101 × 16 full dot matrix display
 - Versatile operation display
 - Easily navigable interactive setting
 - New chart cassette
 - White LED
- Analog record of computed result (with the computation option: /M1)
- Network function
 - Ethernet, RS422A/485 communication option

μR10000 Specifications

Recording width: 100 mm
 Chart length: 16 m
 Number of inputs
 Pen model: 1-4 pens
 Dot model: 6 dot model
 Input type: ±20 mV to ±50 V, 1-5 V range
 TC (R, S, B, K, E, J, T, N, W, L, U, WRe)
 RTD (Pt100, Jpt100)
 DC current (with external shunt register)
 Measurement interval
 Pen model: 125 ms/channel
 Dot model: 1 s/6 dot or 2.5 s/6 dot
 Recording method
 Pen model: Disposable fel + pen, plotter pen
 Dot model: 6 color wire dot
 Recording period
 Pen model: consecutive recording
 Dot model: max. 6 channel/10 sec
 Display: VFD 101 × 16 full dot matrix display
 Display types
 Multiple displays
 digital, bar, flag, DI/DO display etc can be displayed.
 15 display types can be selected from approx. 80 display types.
 Alarm levels: Up to 4 levels for each channel
 Alarm type:
 High and low limit, differential high and low limit,
 high and low rate-of-change, delay high and low
 Optional specification:
 Alarm output, RS422A/485 communication,
 Ethernet communication, Computation function,
 Expansion inputs, Remote input Calibration Correction,
 Header printout, Portable Type, 24 V DC/AC Power Supply etc.
 Dimension: Approx. 144 (W) × 144 (H) × 220 (D) mm
 Weight: 2.1 to 2.5 kg



μR20000

Intelligent Industrial Recorder (180 mm recording chart)

μR20000 has carried over μR series high reliability and basic functions. The 181 × 16 full-dot matrix display allows it to monitor various on-site data.

- High reliability and high quality
 - Fully contact-less technology
 - High degree of integration using custom IC
 - Light weight (8.4 kg for 6 dot-model)
 - Dust and splash proof front door
- Variety of line-up
 - 1, 2, 3, 4 pen models, 6, 12, 18, 24 dot models
- Variety of input types
 - Universal inputs
 - Many input sensors available (35 input types such as Pt50, PR20-40 etc)
- Superior ease-of-operation
 - VFD 181 × 16 full dot matrix display
 - Versatile operation display
 - Easily navigable interactive setting
 - White LED
- Analog record of computed result (with the computation option: /M1)
- Network function
 - Ethernet, RS422A/485 communication option

μR20000 Specifications

Recording width: 180 mm
 Chart length: 20 m
 Number of inputs
 Pen model: 1, 2, 3, 4 pens
 Dot model: 6, 12, 18, 24 dots
 Input type: ±20 mV to ±50 V, 1-5 V range
 TC (R, S, B, K, E, J, T, N, W, L, U, WRe)
 RTD (Pt100, Jpt100)
 DC current (with external shunt register)
 Measurement interval
 Pen model: 125 ms/channel
 Dot model: 1 s/6 dot, 2.5 s/12 to 24 dot or 2.5 s/6 dot, 5 s/12 dot, 10 s/18 to 24 dot
 Recording method
 Pen model: Disposable felt pens, plotter pen
 Dot model: 6 color wire dot
 Recording period
 Pen model: Consecutive recording
 Dot model: Max. 6 ch/10 s, 7 to 12 ch/15 s, 13 to 18 ch/20 s, 19 to 24/30 s
 Display: VFD 181 × 16 full dot matrix display
 Display types
 Multiple displays
 digital, bar, flag, DI/DO display etc can be displayed.
 15 display types can be selected from approx. 80 display types.
 Alarm levels: Up to 4 levels for each channel
 Alarm type:
 High and low limit, differential high and low limit,
 high and low rate-of-change, delay high and low
 Optional specification:
 Alarm output, RS422A/485 communication,
 Ethernet communication, Computation function,
 Expansion inputs, Remote input Calibration Correction,
 Header printout, Portable Type, 24 V DC/AC Power Supply etc.
 Dimension: Approx. 288 (W) × 288 (H) × 220 (D) mm
 Weight: Pen model: 7.5 to 7.6 kg
 Dot model: 8.4 to 9.0 kg

A Meter for Power Facility and a Monitor for Monitoring Energy Consumption



PR300

Power and Energy Meter

- Saves on cost, wiring, and space
 - Integrates a wide selection of functions for measuring things like energy (active, regenerative, reactive, and apparent), power (active, regenerative, reactive, and apparent), voltage, current, frequency, and power factor into a single unit.
- Universal design
 - Converts the phase and wire system of an AC power system and an input voltage circuit to a universal format.
 - The PR300 can select the phase and wire system from among single-phase two-wire, single-phase three-wire, three-phase three-wire, and three-phase four-wire systems. Also it can select the input voltage up to 600 V AC.
 - Compatible with ANSI 4-inch round form size, DIN 96-square instrument size, and JIS 110-square instrument size.
- Employs a large, three-row LED display
 - Capable of confirming three-phase voltage and current on the three-row display simultaneously.
 - Three desired measurement items such as power, current, and energy assigned to the three-row display can be confirmed by changing up to 8 patterns.
 - Equipped with a phase switch key. Phase indication format A, B, and C provided for overseas use, in addition to R, S, and T.
- Equipped with a multitude of functions
 - Measures the maximum and minimum values of power, voltage, frequency, and power factor and the maximum value of current.
 - Transducer function: Transmits power, voltage, current, power factor, and frequency to the external instrument at 4 to 20 mA DC.
 - Demand measuring function: Demand current and demand power with alarm output prevents excess of contract power.
 - Pulse output function: Transmits pulses proportional to energy (active, regenerative, reactive, and apparent)
 - Optional integrating function: Measures energy at arbitrary times. Also measures energy of each process of productive facility.
 - Standard equipped with an RS-485 communication and capable of Ethernet communication.

PR300 Specifications

- Phase and wire system: Universal phase and wire system (single-phase two-wire, single-phase three-wire, three-phase three-wire, and three-phase four-wire systems)
Three-phase four-wire system (2.5 element)
- Input frequency: 45 to 65 Hz
Input voltage: Universal voltage (150 V AC, 300 V AC, 600 V AC)
Input current: 1 A AC, 5 A AC
Accuracy rating:
Voltage and current: $\pm 0.25\%$ of F.S.
Active power: $\pm 0.5\%$ of F.S.
Active energy: $\pm 0.5\%$ (EN60687 accuracy: class 0.5 or equivalent)
Analog output: Measurement accuracy of measurement item for output + ($\pm 0.5\%$ of F.S.) (optional)
- Control signal for optional integration or demand alarm release (optional): Voltage 1 point
Analog output: 4 to 20 mA DC 1 point (optional)
Allowable load resistance: 0 to 600 Ω
Electric energy pulse output: Open collector 1 point (optional)
Output capacity: 30 V DC at 200 mA DC
Demand alarm output: Open collector 1 point (optional)
Output capacity: 30 V DC at 200 mA DC
- Communication
Communication specifications: RS-485 interface (standard equipment)
Ethernet communication (optional)
Communication protocol: [RS 485] PC link, MODBUS, and PR201 protocol [Ethernet] MODBUS/TCP
- Measured Value display: 3-row, 5-digit, 7-segment red LED display
Power supply: 100-240 V AC $\pm 10\%$ (50/60 Hz) or 130-300 V DC $\pm 15\%$
External dimensions: 110 (W) \times 110 (H) \times 126.5 (D) mm (ANSI 4-inch round form size)
96 (W) \times 96 (H) \times 124.5 (D) mm (DIN 96-square instrument size)

Easy-to-operate Simple Controller



UT130/UT150/UT152/UT155

Temperature Controller

- Easy-to-read displays
- Dynamic self-tuning function for easy start up
- Heating/cooling control is available
- Various alarm functions (optional)

UT130/150/152/155 Specifications

- Input accuracy: $\pm 0.3\%$, control cycle 500 ms
- Universal input: TC, RTD, DCV (except UT130)
- Control output: 4 to 20 mA (except UT130), voltage pulse, and relay
- Digital input: Max. 2 points (UT130: Not available)
- Communication function via RS485 interface compatibility: Simple communication with graphic panel/PLC/PC (PC link/ladder communication/Modbus protocol) Coordinated operation available
- High reliability: conforms to UL, CSA, and CE-mark certification
- Front panel conforms to UT130/150: IP65
UT152/155 or equivalent (dust-and drip-proof): IP55
- Dimensions: UT130/150: 48 (W) \times 48 (H) \times 100 (D) mm
UT152: 48 (W) \times 96 (H) \times 100 (D) mm
UT155: 96 (W) \times 96 (H) \times 100 (D) mm
- Weight: UT130/150: approx. 0.2 kg
UT152: approx. 0.3 kg
UT155: approx. 0.4 kg

Economical, High-performance Type



UT351/UT321

Digital Indicating Controller

- Easy-to-operate general-purpose controllers
- Large clear PV display (with Active Color PV Display)
- A/M mode switching key (standard)
- Heating/cooling control included
- Retransmission output (standard) (also usable as the power supply for the sensor)
- Number of combination of setpoints and PID parameters: 4
- 24 VDC loop power supply (optional)

UT351/UT321 Specifications

- Input accuracy: $\pm 0.1\%$, control cycle 250 ms
- Dimensions: UT351: 96 (W) \times 96 (H) \times 100 (D) mm
UT321: 48 (W) \times 96 (H) \times 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output: voltage pulse, 4 to 20 mA, and relay
- Overshoot suppression "super" function, hunting suppression "super2" function and auto-tuning (standard)
- Alarm output: 3 points (standard)
- Heater burnout alarm specifiable
- Communication function via RS485 interface compatibility: simple communication with graphic panel/PLC/PC (PC link/ladder communication/Modbus protocol) Coordinated operation available
- High reliability: conforms to UL, CSA, and CE-mark certification
Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Weight: approx. 0.7 kg (for both the UT351 and UT321)
- Parameter settings on a PC is available with the LL100 parameters setting tool.

Multi-function, High-performance Type



UT450/UT420
Digital Indicating Controller

- Simple operation
- Large clear PV display
- Heating/cooling control and position proportional control (UT450) included
- Remote setpoint input available
- Retransmission output (standard) (also usable as the power supply for the sensor)
- Number of setpoint and PID parameter combinations: up to 8
- 24 VDC loop power supply (option for UT450)

UT450/UT420 Specifications

- Input accuracy: $\pm 0.1\%$, control cycle 200 ms
- Dimensions
UT450: 96 (W) \times 96 (H) \times 100 (D) mm
UT420: 48 (W) \times 96 (H) \times 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output: voltage pulse, 4 to 20 mA, and relay
- Overshoot suppression "super" function, hunting suppression "super 2" function, and auto-tuning (standard)
- Alarm output: 4 points
- Communication function via RS485 interface compatibility: simple communication with graphic panel/PLC/PC (PC link/ladder communication/Modbus protocol) Coordinated operation available
- High reliability: conforms to UL, CSA and CE-mark certification Front panel conforms to IP55 or equivalent (dust - and drip-proof)
- Security function using password
- Parameters settings on a PC is available with the LL100 parameters setting tool
- Weight: Approx. 1 kg or less (for both the UT450 and UT420)

Broad-ranging, High-performance Type



UT550/UT520
Digital Indicating Controller

- High performance controllers with lots of functions
- Large clear PV display
- Heating/cooling control and position proportional control (UT550) included
- Remote setpoint input available
- Retransmission output (standard) (also usable as the power supply for the sensor)
- Number of setpoint and PID parameter combinations: up to 8
- Easily applied to cascade control or input switching control by selecting function modes
- 24 VDC loop power supply (option for UT550)

UT550/UT520 Specifications

- Input accuracy: $\pm 0.1\%$, control cycle 50 ms (fastest)
- Dimensions
UT550: 96 (W) \times 96 (H) \times 100 (D) mm
UT520: 48 (W) \times 96 (H) \times 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output: voltage pulse, 4 to 20 mA, and relay
- Overshoot suppression "super" function, hunting suppression "super2" function and auto-tuning (standard)
- Extended DI/O (UT550: alarm output up to 8 points available)
- Communication function via RS485 interface compatibility: simple communication with graphic panel/PLC/PC (PC link/ladder communication/Modbus protocol) Coordinated operation available
- High reliability: conforms to UL, CSA and CE-mark certification Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Parameter settings on a PC is available with the LL100 parameters setting tool
- Weight: Approx. 1 kg or less (for both the UT550 and UT520)

Excellent Control, Multifunction Type



UT750
Digital Indicating Controller

- Advanced highly functional indicating controller
- Large clear PV display
- Legible LCD indication
- Applicable to dual-loop control
- Easy selection of functions
- Control functions, such as temperature and humidity control or cascade control, are easily set up by selecting control function modes prepared in advance
- Easily applied to cascade control or input switching control by selecting function modes
- Customized computation function

UT750 Specifications

- Input accuracy: $\pm 0.1\%$, control cycle 50 ms (fastest)
- Dimension: 96 (W) \times 96 (H) \times 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output: voltage pulse, 4 to 20 mA, and relay
- DI/O increase available (using I/O extension modules): up to 23 points
- Communication function via RS485 interface compatibility (2 ports): simple communication with graphic panel/PLC/PC (PC link/ladder communication/Modbus protocol) DI/O increase and coordinated operation available
- High reliability: conforms to UL, CSA, and CE-mark certification Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Parameter settings on a PC is available with the LL100 Parameters Setting Tool
- User preferable and definable I/O computation using the LL200 Custom Computation Building Tool
- Weight: Approx. 1 kg

Programmable Controller with Bar Graph Displays



US1000
Digital Indicating Controller

- 30-segment LED PV bar graph
- Comes standard with a universal input that can directly accept sensor input
- Powerful dual-loop control function
- Custom computation function that covers a wide range of applications and is created by users combining controls and computations. (This is easily created using the LL1200 PC-Based Custom Computation Building Tool.)

US1000 Specifications

- Input accuracy: $\pm 0.1\%$, control cycle 50 ms (fastest)
- Universal input: TC, DCV, RTD
- Control output: voltage pulse, 4 to 20 mA, and relay
- Digital input/output: Max. 7 points for each
- Communication function via RS485 interface compatibility: simple communication with graphic panel/PLC/PC (PC link/Modbus protocol) Coordinated operation available
- High reliability: conforms to FM, CSA, and CE-mark certification Front panel conforms to IP65 or equivalent (dust-and drip proof)
- Option Software
LL1100 Parameters Setting Tool
LL1200 Custom Computation & Parameter Setting Tool
- Dimension: 72(W) \times 144 (H) \times 149 (D) mm
- Weight: Approx. 0.8 kg

Simple, General Purpose-program Type

**UP351**

Program Controller

- Practical general-purpose program controller
- Large clear PV display (with Active Color PV Display)
- Program capacity: 2 patterns (10 segments/pattern)
- PV event 2 points: time event one point
- Retransmission output (standard) (also usable as the power supply for the sensor)

UP351 Specifications

- Input accuracy: $\pm 0.1\%$, control cycle 250 ms
- Dimension: 96 (W) \times 96 (H) \times 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output: voltage pulse, 4 to 20 mA, and relay
- Overshoot suppression "super" function, hunting suppression "super2" function and auto-tuning (standard)
- Communication function via RS485 interface compatibility: simple communication with graphic panel/PLC/PC (PC link/ladder communication/Modbus protocol) Coordinated operation available
- High reliability: conforms to UL, CSA, and CE-mark certification Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Parameter settings on a PC is available with the LL100 parameters setting tool
- Weight: Approx. 0.7 kg

Complete, High-performance Program Type

**UP550**

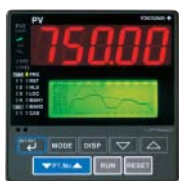
Program Controller

- Function-completed high performance program controller
- Large clear PV display and legible LCD pattern display
- Capacity: 30 patterns/300 segments
- Heating/cooling control and position proportional control included
- Event setting: settable for up to 16 time events and 8 PV events (output up to 8 points)
- Retransmission output (standard) (also usable as the power supply for the sensor)
- Easily applied to cascade control or input switching control by selecting function modes

UP550 Specifications

- Input accuracy: $\pm 0.1\%$, control cycle 100 ms (fastest)
- Dimension: 96 (W) \times 96 (H) \times 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output: voltage pulse, 4 to 20 mA, and relay
- Overshoot suppression "super" function, hunting suppression "super2" function and auto-tuning (standard)
- DI/O extendable (up to 8 points for both DI and DO)
- Communication function via RS485 interface compatibility: simple communication with graphic panel/PLC/PC (PC link/ladder communication/Modbus protocol) Coordinated operation available
- High reliability: conforms to UL, CSA, and CE-mark certification Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Parameter settings on a PC is available with the LL100 parameters setting tool
- Weight: Approx. 1 kg or less

Large Capacity, Multifunction Program Type

**UP750**

Program Controller

- Advanced highly functional program controller
- Large clear 5-digit PV display and LCD display
- Large capacity: 300 patterns/3000 segments
- Applicable to dual-loop control
- Easy selection of functions (UP mode) Difficult control functions, such as temperature and humidity control or cascade control, are easily set up by selecting control function modes prepared in advance
- Customized computation function

UP750 Specifications

- Input accuracy: $\pm 0.1\%$, control cycle 100 ms (fastest)
- Dimension: 96 (W) \times 96 (H) \times 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output: voltage pulse, 4 to 20 mA, and relay
- DI/O extendable (I/O extension modules used)
- Communication function via RS485 interface compatibility (2 ports): simple communication with graphic panel/PLC/PC (PC link/ladder communication/Modbus protocol) DI/O increase and coordinated operation available
- High reliability: conforms to UL, CSA, and CE-mark certification Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Parameter settings on a PC is available with the LL100 parameters setting tool
- User preferable and definable I/O computation using the LL200 custom computation building tool
- Weight: Approx. 1 kg

Exceptionally Clear and Large Display, General Purpose Indicator

**UM351/UM331**

Digital Indicator with Alarms

- Easy-to-use general-purpose indicating alarm meters
- Large clear PV display (with Active Color PV Display)
- Alarm output available for up to 4 points
- Retransmission output (standard) (also usable as the power supply for the sensor)
- 24 VDC loop power supply (optional)

UM351/UM331 Specifications

- Input accuracy: $\pm 0.1\%$, sampling cycle of 250 ms
- Dimensions UM351: 96 (W) \times 96 (H) \times 100 (D) mm UM331: 96 (W) \times 48 (H) \times 100 (D) mm
- Universal input: TC, DCV, RTD
- Alarm output: 3 points (standard), the addition of one more point available
- Communication function via RS485 interface compatibility: simple communication with graphic panel/PLC/PC (PC link/ladder communication/Modbus protocol)
- High reliability: conforms to UL, CSA, and CE-mark certification Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Weight: Approx. 0.7 kg (for both the UM351 and UM331)

GREEN Series Digital Indicating Controller with Industrial Ethernet

UT351- *A/UT551- *A to *D

http://www.yokogawa.com/ns/cis/utup/ut/ns-index_ut.htm

Simple, High-performance Type



UT351- *A Specifications

- Input accuracy: ±0.1%, control cycle 250 ms
- Dimension: 96 (W) × 96 (H) × 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output: voltage pulse, 4 to 20 mA, and relay
- Overshoot suppression "super" function, hunting suppression "super2" function and auto-tuning (standard)
- Alarm output: 3 points (standard)
- Heater burnout alarm specifiable
- Ethernet communication function 10BASE-T/100BASE-TX Modbus/TCP protocol
- Gate way communication function
- High reliability: conforms to UL, CSA, and CE-mark certification
Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Weight: Approx. 0.7 kg
- Parameter settings on a PC is available with the LL100 parameters setting tool.



UT351- *A

Digital Indicating Controller with Industrial Ethernet^{1,2}

- Easy-to-operate general-purpose controllers
- Large clear PV display (with Active Color PV Display)
- Heating/cooling control included
- A/M mode switching key (standard)
- Retransmission output (standard) (also usable as the power supply for the sensor)
- Number of combination of setpoints and PID parameters: 4

Broad-ranging, High-performance Type



UT551 Specifications

- Input accuracy: ±0.1%, control cycle 100 ms/200 ms/500 ms
- Dimension: 96 (W) × 96 (H) × 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output: voltage pulse, 4 to 20 mA, and relay
- Overshoot suppression "super" function, hunting suppression "super2" function and auto-tuning (standard)
- Extended DI/O (alarm output up to 8 points available)
- Ethernet communication function 10BASE-T/100BASE-TX Modbus/TCP protocol
- Gate way communication function
- High reliability: conforms to UL, CSA, and CE-mark certification
Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Parameter settings on a PC is available with the LL100 parameters setting tool
- Weight: Approx. 1 kg or less



UT551- *A to *D

Digital Indicating Controller with Industrial Ethernet^{1,2}

- High performance controllers with lots of functions
- Large clear PV display (with Active Color PV Display)
- Position proportional control included
- Remote setpoint input available
- Retransmission output (standard) (also usable as the power supply for the sensor)
- Number of setpoint and PID parameter combinations: up to 8
- Easily applied to cascade control or input switching control by selecting function modes

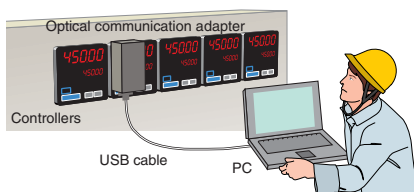
1: Ethernet is the trademark of XEROX Corporation.
2: Please prepare Ethernet cable individually.

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PC-Based Parameters Setting Tools

LL100/LL200, LL1100/LL1200 (for US1000)

http://www.yokogawa.com/ns/cis/utup/ll/ns-index_ll.htm



LL100/LL200, LL1100/LL1200 (for US1000) Light Loader

LL100/LL1100 and LL200/LL1200 are software package that enables you to set the controllers configuration parameters. The optical communication adapter will connect and communicate through the drip- and dust-proof panel of the controller. It can easily be set via Ethernet. (for UT351-*A, UT551)

LL100/LL1100 Parameters Setting Tool

- Applicable Controllers: UT320, UT321, UT350, UT351, UT420, UT450, UT520, UT550, UT551, UT750, US1000, UP350, UP351, UP550, UP750

The LL100/LL1100¹ PC-based Parameters Setting Tool is a software package used to set the setup parameters, operating parameters, and program patterns² of the GREEN Series controllers from a personal computer. This tool allows users to download, upload, print out parameters, and display PV trend data during PID tuning etc.

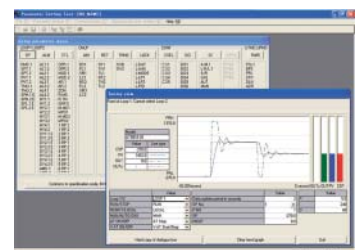
- *1: The LL1100 is for US1000 controller only.
- *2: For program controllers only.

LL200/LL1200 Custom Computation Building Tool

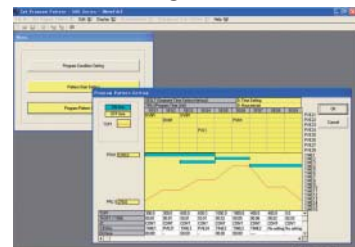
- Applicable Controllers: US1000, UT750, UP750

The LL200/LL1200¹ PC-based Custom Computation Building Tool is a software package used to create custom computation and custom display functions. This tool also covers the functions of the LL100/LL1100 PC-based Parameters Setting Tool. The custom computation building function, the main function of this package, enables users to formulate computations graphically. This tool has an online help function that provides explanations of the computation modules.

- *1: The LL1200 is for US1000 controller only.



Tuning screen



Program pattern setting up screen



Multi-monitor display

Compact, High Performance

**VJ Series**

Compact, Plug-in Signal Conditioners

VJ Series signal conditioners have a compact, space-saving plug-in style design. The lineup includes a universal input type, versatile I/O specifications, wide-range of power supply, isolated two outputs and field configurable models. Optional 2 relay alarm outputs or RS-485 communication function can be equipped for multi-function models.

Features

- Compact design for space saving
The dimension is 76 (H) × 29.5 (W) × 124.5 (D) mm.
- Two isolated outputs
Second isolated current or voltage (pulse) output is available as optional feature.
- Communication function
Optional MODBUS (RS-485) communication function can be obtained simultaneously with analog output signal from one VJ unit.
- Alarm outputs
Optional Hi/Low relay alarm outputs can be output simultaneously with analog (pulse) output signal from one VJ unit.
- Field configuration
A field configuration of the microprocessor based VJ is possible from your PC (with VJ77 PC-based parameters setting tool) or using our Handy Terminal (JHT200).
- Compliance with international safety standards; CE, CSA and UL.

Specifications (Isolator VJH7)

Accuracy rating: $\pm 0.1\%$ of Span
Response speed: 200 ms, 63% (10 to 90%)
Power supply: 100-240 AC/DC (-15, +10%), 50/60 Hz or 15-30 VDC ($\pm 20\%$)
Alarm output (optional 2nd output)
N.O.relay contact, 2 points, COM common
Communication output (optional 2nd output)
Protocol: Modbus ASCII, Modbus RTU,
number of connectable instruments: up to 31 units
communication distance: up to 1200 m
communication rate: 1200, 2400, 4800, 9600 bps

Lineup

Isolator	VJH7
Distributor	VJA7
Universal Temperature Converter	VJU7
Potentiometer Converter	VJS7
Pulse to Analog Converter	VJP7
Analog to Pulse Converter	VJQ7
Pulse Rate Converter	VJP8
Universal Computing Unit	VJX7

PC-based Parameters Setting Tool: VJ77

Field configuration tools to set, change and monitor the range, zero/span, burnout, parameters, computation program, etc. of the microprocessor based JUXTA signal conditioners and computing units.

Standard, Quantity Stability, Easy Adjustment

**M Series**

Standard, Plug-in Signal Conditioner

The JUXTA M Series, 8 models of free range type, is signal converters that offers good maintainability. It enables easy and reliable adjustment on site using a screwdriver. On site configuration of JUXTA, such as for input/output range, type of the sensors, burnout operation etc., is possible by using the setting tools from your PC.

Feature

- Easy for settings of the input/output range by using VJ77, Parameter Setting Tool, or JHT200, Handy Terminal. (All 8 models of M series)
- Adjustment can be made easily by using a screwdriver. (All 8 models of M series)
- Output testing is possible by setting arbitrary percentage values via JHT200 or VJ77. (All 8 models of M series)
- Universal Temperature Converter can change the type of its input sensors via JHT200 or VJ77.
- Also the wiring resistance can be easily adjusted using a screw driver.
- Input range of the Potentiometer Converter can be set easily by using a screwdriver

Lineup

Distributor (Free Range Type)	MA5
Distributor (2-output, Free Range Type)	MA5D
Isolator (Free Range Type)	MH5
Isolator (2-output, Free Range Type)	MH5D
Universal Temperature Converter (Free Range Type)	MU5
Universal Temperature Converter (2-output, Free Range Type)	MU5D
Potentiometer Converter (Free Range Type)	MS5
Potentiometer Converter (2-output, Free Range Type)	MS5D

Universal Temperature Converter MU5, MU5D

Input signal: Selection of input type (Thermocouple, RTD or mV signal)

Output signal: It can set up the following specification.

- A: 0 to 20 mA DC Span is 5 mA or more
B: 0 to 5 mA DC Span is 1 mA or more
1: ± 10 V DC Span is 0.1 V or more
2: ± 100 mV DC Span is 10 mV or more

Power supply: 85-264 V AC/DC or 12-48 V DC

Accuracy rating: $\pm 0.1\%$ of span

Accuracy of reference junction compensation (RJC):

- Other than Type R and S: $\pm 1^\circ\text{C}$ (0 to 50°C)
Type R and S: $\pm 2^\circ\text{C}$ (0 to 50°C)

External dimensions:

86.5 (H) × 51 (W) × 123 (D) mm (including a socket)

Weight: Main unit: Approx. 200 g Socket: approx. 60 g

Support for a Variety of Applications



VJET

Ethernet/RS-485 Converter

The VJET Ethernet/RS-485 converter is a compact, plug-in type communication converter that uses the Modbus/TCP protocol for connecting to host devices with Ethernet capability, and uses the Modbus/RTU protocol for connecting to devices with RS-485 communication function.

Features

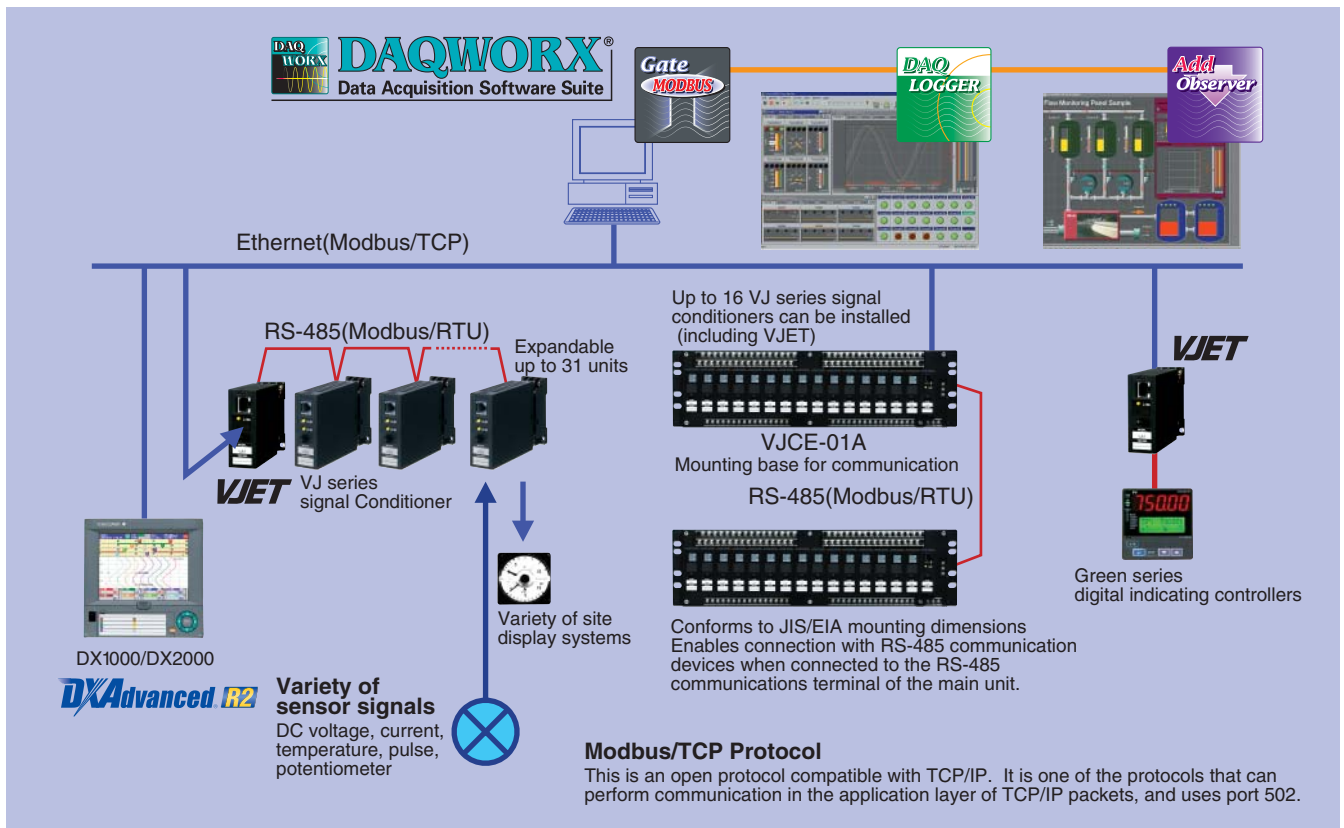
- Enables monitoring of multiple widely separated sensor signals from a single location via Ethernet. Up to 31 sources can be monitored per VJET unit.
- Monitoring systems can be set up quickly using DAQWORX* software (recommended).
*DAQWORX Data Acquisition Software Suite
- Installs in your existing LAN with a minimum of additional wiring.
- 29.5 mm wide (installed) space-saving design. Mounts easily on the wall or on DIN rails. Can be rack-mounted when installed in the VJCE-01A mounting base for communication.
- Choose 24 VDC or 100-240 VAC/DC power supply specifications.
- Supports CSA, CE, and UL safety standards.

Specifications

Ethernet communication	
Interface	Conforms to IEEE802.3 (10BASE-T/100BASE-TX)
Protocol	Modbus/TCP
Access control	CSMA/CD
Transfer rate	10/100 Mbps
Maximum segment length	100 m (the length between Hub and converter)
Maximum connecting configuration	Up to 4 cascade connection per hub (10BASE-T) Up to 2 cascade connection per hub (100BASE-TX)
RS-485 communication	
Interface	Conforms to EIA RS-485
Protocol	Modbus/RTU
Transfer system	Half-duplex communication
Synchronous system	Start-stop synchronization
Transfer rate	9600 bps
Data length	8
Stop bit	1
Parity	Even, odd or none
Power supply	
Power supply rated voltage	24 VDC ±10% or 100-240 VAC/DC (-15, +10%), (50/60 Hz)
Power consumption	1.8 W at 24 VDC; 1.5 W at 110 VDC 2.6 VA at 100 VAC, 4.0 VA at 200 VAC

■ VJET Setting Tool version 1.02

VJET communication parameter can easily be set via Ethernet. High-speed response mode, parity, IP address, subnet mask, TCP/IP port, default gateway. Visit our web site and download this software http://www.yokogawa.com/ns/cis/field/ns-vjet_01.htm See the VJET user's manual (IM 77J01E11-01E) for the detailed specifications.



Modbus/TCP Protocol

This is an open protocol compatible with TCP/IP. It is one of the protocols that can perform communication in the application layer of TCP/IP packets, and uses port 502.

DAQWORX

DAQWORX

<http://www.yokogawa.com/ns/daqworx/>

Data Acquisition Software Suite



DAQWORX

Our integrated data acquisition software package responds to changeable market conditions with a high degree of scalability.

By combining YOKOGAWA recorders and data acquisition stations and instruments, you can create data acquisition systems without the need for special programming. You can easily increase the measurement bandwidth and range of applications by including our high-value-added software.

Features

DAQWORX comprises four data acquisition "Base" software programs, six "Add-on" programs with high-value-added functions, eight "Gate" interface programs, and a common Viewer program for a total of nineteen software components. These can be combined as desired to build a data acquisition and monitoring system that is ideal for the user's application. DAQWORX can be categorized into two packages depending on the data acquisition software selected.

• Integrated Package

Centered around DAQLOGGER data acquisition software, this package allows you to build a data acquisition and monitoring system with not only recorders and data acquisition equipment, but also by integrating a wide variety of other measuring instruments and devices through interface programs. Furthermore incorporating various high-value-added software programs will enable you to record on a group-by-group basis, set up triggered recording, monitor on user-created screens, and perform many other specialized functions.

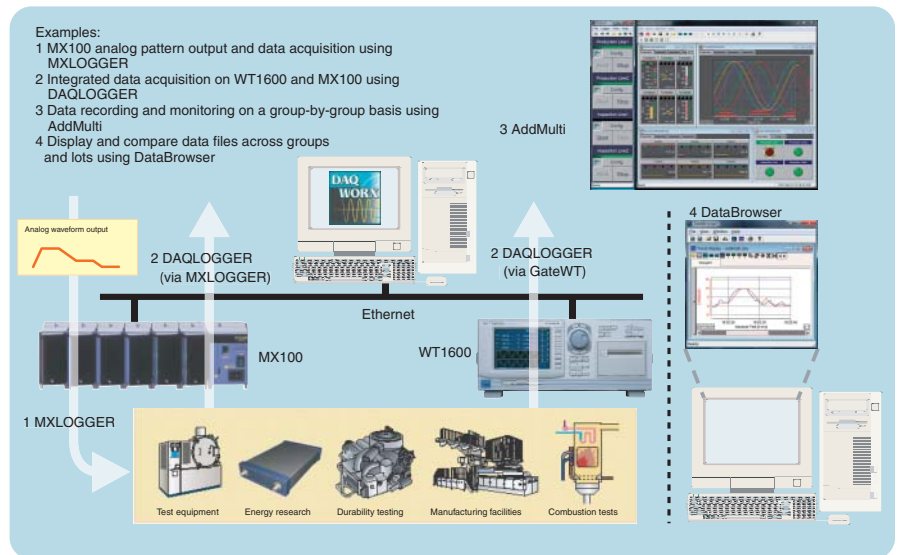
• Product Specific Packages

These are data acquisition software programs designed to maximize hardware performance; DAQ32Plus for DARWIN, MXLOGGER for DAQMASTER MX, and DAQEXPLORER for DAQSTATION DX/CX and MobileCorder MV. High-value-added software can be combined, and acquired data can be integrated with DAQLOGGER.

List of Software

- Integrated Package
 - DAQLOGGER: General purpose data acquisition on a maximum of 32 units/1600 ch, shortest measurement interval of 1 second.
 - <Supported Instruments>
 - DXAdvanced/DX/CX, MV, DA/DC/DR, VR, and the μ R1000/1800.
 - GateDX-P: Interface for DX100P/DX200P
 - Gate μ R: Interface for μ R10000/ μ R20000
 - GateMX/MW: Interface for MX100/MW100
 - GateCONTROL: Interface for small-scale measurement instruments (controllers, signal conditioners, etc.)
 - GateWT: Interface for WT series power measuring instruments
 - GateOPC: Interface for OPC DA server
 - GateMODBUS: Interface for MODBUS (TCP/RTU)
 - GateEye: Real time image transfer from Web cameras to AddObserver monitoring panels.

- DAQLOGGER Client: Remote monitor for DAQLOGGER
- AddObserver: Real time monitoring on user-created screens (with "Builder" screen editor)
- AddObserver Runtime: Real time monitoring on user-created screens (runtime version)
- AddMulti: Acquisition on a group-by-group basis (32 ch \times 50 groups)
- AddTrigger: Acquisition using a wide array of trigger conditions
- Product Specific Package
 - DAQ32Plus: For DARWIN, shortest acquisition interval of 0.5 seconds
 - MXLOGGER: For the MX100, shortest acquisition interval of 10 ms
 - DAQEXPLORER: For DXAdvanced/DX/CX/MV, automatic data file transfer
 - DAQ32Plus Client: Remote monitor for DAQ32Plus
 - AddObserver(Runtime)/AddMulti/AddTrigger: see the integrated package.
- Viewer (Common to All)
 - DataBrowser: File searching and multi-waveform display

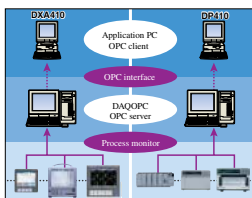


DAQOPC

DXA410 for DX/DX-P/CX/MV, DP410 for DARWIN

http://www.yokogawa.com/ns/daq/daq-index_software.htm

OPC Interface Package



DXA410 for DX/DX-P/CX/MV, DP410 for DARWIN OPC Interface Package

OPC (OLE for Process Control) is a comprehensive interface standard for communication between applications. Established by the OPC Foundation in the US, OPC is recognized as an international standard. DAQOPC allows DARWIN Series (DP410), DX/DX-P/CX/MV Series (DXA410) units to connect with a wide variety of client applications (SCADA software and user application software).

DAQOPC Features

- DAQOPC is an OPC server which supports OPC Data Access Version 2.0.
- DAQOPC provides OPC clients with custom interfaces and automation interfaces.
- DAQOPC supports the browser function, enabling OPC clients to browse information on OPC servers

Function Specifications

- DAQOPC provides the following OPC specification interfaces.
- Data Access (DA) server function
 - The DA server reads process data using item IDs as identifiers, and writes process data through communication input channels (C01 through C60).

System configuration

- Server/client configuration
 - DAQOPC users (OPC clients) can be configured in the following two ways:
 - OPC client coexisting on the same PC as DAQOPC
 - OPC client present on host computer (Windows 2000/XP)
 - Multiple-client configurations
 - Multiple OPC clients can access a single DAQOPC.

- Multiple-server configurations
 - A single OPC client can access multiple DAQOPC server.

Compatible Equipment

- DXA410: DX100/DX200/DX100L/DX200C/DX100P/DX200P/CX1000/CX2000/MV100/MV200
- DP410: DA100/DC100/DR130/DR230/DR240
- Communication standards:
 - Ethernet: All models listed above
 - RS-232/RS-422A/RS-485: All models listed above except DX100P/DX200P
- Operating systems: Windows 2000 or XP Professional

Application capacity

- A number of connected clients: Up to 100
- A number of group objects: Up to 1000
- A number of registered item IDs: Up to 10,000/group
- A number of cache updated item IDs: Up to 100,000
- Cache updating interval: 1 to 3600 sec
- A number of connected units (DXA410): Up to 24
- A number of connected units (DP410): Up to 16

Datum-Y, Datum-LOGGER

Compact Data Logger Offering Best-in-class Noise Resistance and Communication Function



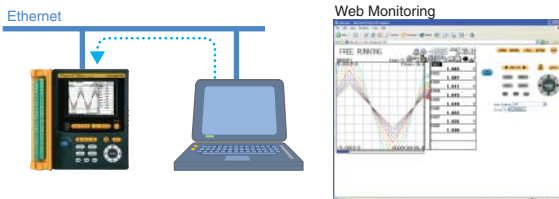
Datum-Y (XL120 Series)

Portable Data Station (Data Logger)

- All channels adopt universal insulated inputs
: The temperature and voltage can be set independently for each channel.
- Easy-to-read screen display
: A wide view color TFT LCD makes it easy to read even outdoors
- Data can be saved at the maximum speed of 100 ms
: Reliably measures temperature changes
- Large amounts of data can be acquired
: Employs compact flash and SD cards.
: USB memory enables support for a data copy function.
- Comes standard with a LAN port
: Also supports remote data acquisition.

Web Server Function

You can easily monitor the Datum-Y screens with the Internet Explorer^{*1} Web browser (Screen display can be updated every 5, 10, or 30 seconds automatically, or manually). You can use Operator Page to remotely operate Datum-Y, except for turning the power on and off and key locking. You can use Monitor Page just to check and switch the Datum-Y screens. You can set access authentication for each screen to enhance security. ^{*1}: Internet Explorer is a registered trademark of Microsoft Corporation.



Specification

- Number of inputs : 8 channels (XL121), 16 channels (XL122, XL124)
Floating unbalanced input, insulated between channels
- Measurement interval: 100 ms (only when the 8-channel terminal block is used), 200 ms, 500 ms, 1 sec, 2 sec, 5 sec, 10 sec, 20 sec, 30 sec, 1 min, 2 min, 5 min, 10 min, 20 min, 30 min, 1 hr
- Input type : TC, RTD, DCV
* RTD for XL121 and XL122 only
Digital Pulse (1ch), DI (2ch)
- Functions : Trigger Functions (Pre-trigger/trigger delay), Four arithmetic operation, Linear scaling, Statistical operation (MAX, MIN, AVE, P-P, RMS)
Communication Functions: Ethernet, USB, RS-232, RS-485
• Network Functions : Web server, FTP server, FTP client, E-mail delivery, Time synchronization
Serial communication Modbus protocol:
Transmission medium: RS-232 or RS-485
Transmission mode: RTU mode, ASCII mode
- Data saving : Internal memory : 16 MB
External storage medium :
Compact flash memory card (Type II), SD card, USB memory
(Only the copy function is supported by USB memory. Only those USB memories that have been verified by Yokogawa are recommended.)
- Display unit : 3.5-inch TFT color LCD (320 × 240 pixels)
- External dimensions : Approx. 155 (W) × 155 (H) × 55 (D) mm
- Weight : Approx. 800 g (Without battery and rubber boot)

FTP Server Function

You can output a list of files stored in Datum-Y's internal memory and connected external storage media, and you can transfer and delete files.

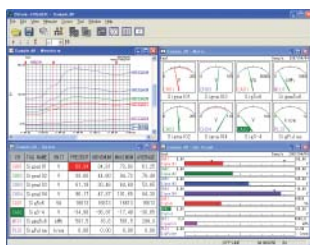


Model Number and Suffix Code

Model	Suffix code	Specification
XL121		8ch, with Screw in type terminal block unit
XL122		16ch, with Screw in type terminal block unit
XL124		16ch, with M3 screws type terminal block unit
	-D	Power cord(UL/CSA Standard)
	-F	Power cord(VDE Standard)
	-H	Power cord(GB Standard)
	-R	Power cord(AS Standard)
	-S	Power cord(BS Standard)

Optional Accessories

Application Software "Datum-LOGGER"



Datum-LOGGER allows you to connect up to ten Datum-Ys to analyze and process data after you perform real-time measurement and acquire data with a PC.

- Real-time measurement at the maximum speed of 1 second
- Zooming to analyze acquired data in the waveform view
- A variety of data saving functions available (selective and partial saving)

Model Number

	Name	Model No.	Description
	Type-K T/C	90060	5 meter × 4 sets
	Carrying case	93037	To store the main unit and accessories
	Lithium ion battery	94009	2,400 mAh, 7.4 V
	Stand	93039	Supports tilted installation on the desktop, wall mounting, and DIN rail mounting
Optional accessories	Digital I/O cable	91029	For pulse/logic inputs and alarm outputs, 3 m
	Application Software (Datum-LOGGER)	XL900	For Datum-Y
	Communication cable	91011	RS-232 communication cable for PC (9 pin)
	Printer cable	91010	RS-232 cable for printer
	Printer	97010	Includes 1 roll thermal paper and 1 battery pack
	Printer thermal paper	97080	10 rolls/set
	AC adapter for printer	94006	Power supply 200-240 V
	AC adapter for printer	94007	Power supply 100-120 V

Printer (97010)



Carrying case (93037)



Lithium ion battery (94009)



Digital I/O cable (91029)



Stand (93039)



Clamp-on Power Meters

CW240, CW120/CW121, AP240E

<http://www.yokogawa.com/gmi/cw>

Electric Power Analysis & Power Supply Quality Control



CW240

Clamp-on Power Meter

- Simultaneous measurement of power, harmonics, voltage fluctuation, and waveform
- Supports a range of connections
- Wide measurement range
- Leakage current measurement
- External memory
- Large LCD

CW240 Specifications

Measuring Mode:
 All items can be measured at the same time
 Instantaneous value (Wave form)/Electric Energy/Demand/Harmonics/Voltage Fluctuation
 Wiring:
 1P2W, 1P3W, 1P3W3i, 3P3W2i, 3P3W3i, 3P4W, 3P4W4i
 Multipul system Load Measurement:
 1P2W × 2/× 3/× 4, 1P3W × 2, 3P3W × 2, SCOTT Wiring (1P3W + 3P3W)
 Range:
 Voltage: 150/300/600/1000 V
 Current: 200.0 mA (96036) to 3000 A (96034/35)
 Accuracy:
 Voltage: ±(0.2% rdg. + 0.1% rng.)
 Current/active power: ±(0.6% rdg. + 0.4% rng.) when using clamps 96030, 96031, 96033 and 96036
 : ±(1.0% rdg. + 0.8% rng.) when using clamps 96032, 96034 and 96035

General Specifications

- External dimensions: 206 (W) × 184 (H) × 65 (D) mm
- Weight: Approx. 1.2 kg (without batteries)
- Power: AC adaptor, AA size alkaline battery × 6

Low-cost Tools to Support Your Energy Conservation



CW120 Series

Clamp-on Power Meter

Input system: Single-phase 2 wire to 3-phase 3-wire (CW120), 3-phase 4-wire (CW121)
 Measurement Functions: Voltage, Current, Frequency, Active power, Reactive power, Power factor, Active power, Regenerative power
 Features: Large capacity of memory (ATA flash memory card), Wiring error check function, Support variety of network communication protocols

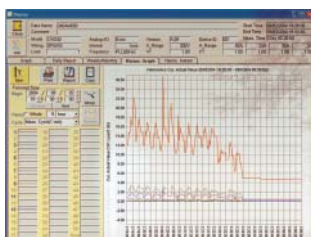
CW120 Series Specifications

Measurement Item:
 Voltage rms (V), Current rms (A), Active Power (W) and Frequency (Hz)
 Wiring:
 CW120: 1P2W, 1P3W and 3P3W and 1P2W × 2
 CW121: 1P2W, 1P3W, 3P3W, 3P4W, 1P2W × 2 and 1P2W × 3
 Range:
 Voltage: 150/300/450 V
 Current: 5/10/20/50/100/200/500/1000 A
 Basic Accuracy:
 Voltage: ±(0.3% rdg. + 0.2% rng.)
 Current/active power: ±(0.8% rdg. + 0.4% rng.) when using clamps 96030, 96031 and 96033
 : ±(1.2% rdg. + 0.8% rng.) when using clamp 96032

General Specifications

- External dimensions: 117 (W) × 161 (H) × 51 (D) mm
- Weight: Approx. 600 g
- Power: AC 100 to 240 V ±10%, 50/60 Hz

Effective power supply quality and power saving management for PCs



AP240E

Data Analytic Program for CW series

- Data Management
- Data Display Selection
- Graph Display
- Daily Report Display, Weekly / Monthly Report Display
- Harmonic Graph Display
- Harmonics Instant Value Display
- Waveform Data Display
- Voltage Change Display

Clamp Probes for CW240/CW120 series

Model	96036	96033	96030	96031	96032	96034	96035
Clamp Probes							
Diameter of measurable conductor	φ 40 mm	φ 18 mm	φ 30 mm	φ 30 mm	φ 65 mm	65 × 100 mm	φ 170 mm
Measuring Range	AC 2 A	AC 50 A	AC 200 A	AC 500 A	AC 700 A (1000 A 5 min)	AC 1000/2000/3000 A	AC 300/3000 A
Output Voltage	AC 50 mV	AC 500 mV	AC 500 mV	AC 500 mV	AC 250 mV	AC 500 mV	AC 500 mV
Frequency Range	20 Hz to 5 kHz	20 Hz to 20 kHz	20 Hz to 20 kHz	20 Hz to 5 kHz	45 Hz to 66 Hz	30 Hz to 1.5 kHz	10 Hz to 20 kHz
External dimensions	70 × 120 × 25 mm	52 × 106 × 25 mm	73 × 130 × 30 mm	73 × 130 × 30 mm	100 × 172.5 × 32 mm	120 × 310 × 48 mm	140 × 64 × 28 mm
Weight	Approx. 300 g	Approx. 220 g	Approx. 300 g	Approx. 300 g	Approx. 500 g	Approx. 1,390 g	Approx. 470 g

* Need to purchase AC adaptor separately

High accuracy and compact design



CA150 Handy Calibrator

Features

- Highly accurate within 0.02% of the DC voltage range for source and measure
- Source and measurement can be performed simultaneously
- Vertical body with large-screen display
- Loop power supply function (24 VDC at a load of max 22 mA)
It is possible to measure current in the mA range while supplying power
- Sink function
- Sweep functions that allow 3 types of continuous outputs:
Step sweep function
Linear sweep function
Program sweep function

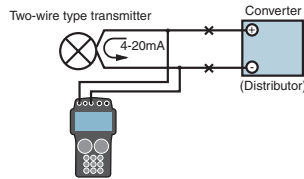
Applications

Two-wire Type Transmitter Applications

Two-wire type transmitter (measurement function) application

Loop check function

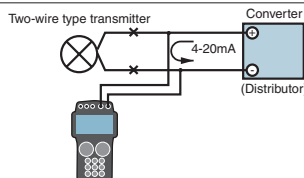
Measures mADC signals output while supplying transmitter power at 24 VDC.



Two-wire type transmitter (source function) application

Sink function

Receives current (Sink) from the power supply at voltages of up to 28 VDC and transmits mADC signals to the loop.



Specifications

Source Unit

	Range	Resolution
DC voltage	100mV	1uV
	1V	10uV
	10V	0.1mV
	30V	10mV
DC current mA SINK	20mA	1uA
	20mASINK	1uA
OHM	500Ω	0.01Ω
	5kΩ	0.1Ω
	50kΩ	1Ω
RTD	PT100 JPT100	0.1°C
Thermocouple	K	0.1°C
	E	
	J	
	T	
	N	
	L	1°C
	U	
	R	
	S	
	B	
Frequency /pulse	100Hz	0.01Hz
	1000Hz	0.1Hz
	10kHz	0.1kHz
	50kHz	1kHz
	CPM	0.1CPM

Measurement Unit

	Range	Resolution
DC voltage	500mV	10uV
	5V	0.1mV
	35V	1mV
DC current	20mA	1uA
	100mA	10uA
OHM	500Ω	0.01Ω
	5kΩ	0.1Ω
	50kΩ	1Ω
RTD	PT100 JPT100	0.1°C
Thermocouple	K	0.1°C
	E	
	J	
	T	
	N	
	L	1°C
U		
R		
S		
B		
Pulse	100Hz	0.01Hz
	1000Hz	0.1Hz
	10kHz	0.001kHz
	CPM	1CPM
	CPH	1CPH
Loop power supply	24V LOOP	

General Specifications

Specifications common to source and measurement

- Communication functions: Serial interface
RS232 D-Sub 9-pin connector
Data can be stored and loaded in setting memory (setting data) and data memory (source/measurement)
- Memory functions:
- Common source specifications
- Power supply: 6 AA size alkaline batteries
AC adapter (sold separately) or dedicated NiMH battery (sold separately)
- Battery life Conditions: Simultaneous Source/measurement
When 6 batteries are used: Approx. 8 hours
When NiMH battery is used: Approx. 10 hours
- Auto power-off: Approx. 10 minutes
- Insulation resistance: Between input terminal and output terminal: 500 VDC, 50 MΩ or more
- Withstand voltage: Between measurement terminal and generation terminal: 350 VAC, 1 minute
- Operating temperature/humidity range: 0 to 40°C, 20 to 80%RH (no condensation)
- Storage temperature range: -20 to 60°C 90%RH or less (no condensation)
- External dimensions: Approx. 251 × 124 × 70 mm
- Weight: Approx. 1000 g (with Batteries)
- Accessories:
Lead cable for generation: 1 set
Lead cable for measurement: 1 set
Carrying case: 1
Terminal adapter: 1
Size AA battery: 6
Instruction Manual: 1
Fuse for measurement: 1 (spare)
- Conforming Standards:
Safety EN61010-1
EMC EN 61326 Class B; EN 55011 Class B Group 1
EN 61000-3-2; EN 61000-3-3, EN61326

Optional Accessories (sold separately)

Product name	AC adapter	RJ sensor	Accessory storage case	NiMH battery	Main body case
Model name	94010	B9108WA	B9108XA	94015	93027
Remark	-D For UL/CSA Standard -F For VDE Standard -H For GB Standard -R For AS Standard -S For BS Standard	For reference junction compensation	Lead cables, RJ sensor, etc. can be stored.	NiMH battery Dedicated	With strap and accessory storage case

Handy Calibrators

CA51/CA71, CA11E, CA12E

<http://www.yokogawa.com/gmi/ca>

Simultaneous Signal Source and Measurement Capability



Specifications

Source Unit

Parameter	Reference	Range	Accuracy (23±5°C per year)	Resolution
DC voltage	100 mV	-10.00–110.00 mV	±(0.02% + 15 μV)	10 μV
	1 V	0–1.1000 V	±(0.02% + 0.1 mV)	0.1 mV
	10 V	0–11.000 V	±(0.02% + 1 mV)	1 mV
	30 V	0–30.00 V	±(0.02% + 10 mV)	10 mV
DC current	20 mA	0–24.000 mA	±(0.025% + 3 μA)	1 μA
	4–20 mA	4/8/12/16/20 mA		4 mA
mA SINK	20 mA	0.1–24.000 mA	±(0.05% + 3 μA)	1 μA
Resistance	400 Ω	0–400.00 Ω	±(0.025% + 0.1 Ω)	0.01 Ω
RTD	PT100	-200.0–850.0°C	±(0.025% + 0.3°C)	0.1°C
	JPT100	-200.0–500.0°C		
TC	K	-200.0–1372.0°C	±(0.02% + 0.5°C)	0.1°C
		-100°C or greater	±(0.02% + 1°C)	
		-200.0–1000.0°C	±(0.02% + 1°C)	
		-100°C or less	±(0.02% + 0.5°C)	
	T	-200.0–400.0°C	±(0.02% + 0.5°C)	0.1°C
		0°C or greater	±(0.02% + 1°C)	
	N	-200.0–1300.0°C	±(0.02% + 0.5°C)	1°C
		0°C or greater	±(0.02% + 1.5°C)	
	L	-200.0–900.0°C	±(0.02% + 1°C)	1°C
		0°C or less	±(0.02% + 2.5°C)	
U	-200.0–400.0°C	±(0.02% + 1.5°C)	1°C	
	0°C or less	±(0.02% + 1.5°C)		
R	0–1768°C	±(0.02% + 2.5°C)	1°C	
		±(0.02% + 1.5°C)		
S	600–1800°C	±(0.02% + 2°C)	1°C	
		±(0.02% + 1.5°C)		
B	600–1800°C	±(0.02% + 1.5°C)	1°C	
		±(0.02% + 1.5°C)		
Frequency, pulse	500 Hz	1.0–500.0 Hz	±0.2 Hz	0.1 Hz
	1000 Hz	90–1100 Hz	±1 Hz	1 Hz
	10 kHz	0.9 kHz–11.0 kHz	±0.1 kHz	0.1 kHz
	Pulse cycle	1–99,999 cycles	–	1 cycle

CA51/CA71

Handy Calibrators

Features

- Source and measure operations can be performed at the same time. (Select from the following source signal and measurement signal options: voltage, current, resistance, thermocouple (TC), resistance temperature detector (RTD), frequency, pulse).
- AC voltages, including supply voltage, can be measured.
- Easy operation.
- Compact size and Lightweight
- Includes a wide array of additional functions.
 - Source
 - Values set in steps of 4–20 mA
 - 24V DC Power Supply to Transmitter
 - Divided output (n/m) function
 - Output settings are divided, eliminating the need for bothersome calculations for percentage output.
 - Autostep function
 - Changes the output value in step form based on the setting from the divided output (n/m) function. Changes can be sourced automatically every 10% or 25%.
 - Online communication (CA71 only)
 - RS-232C-compliant optically isolated interface
 - Sweep function
 - Linearly increases or decrease the output. The increasing/decreasing time can be set to either 16 or 32 seconds.
 - Memory function
 - Source values and measurements forming individual value sets can be saved to or read from the Handy Calibrator's internal memory (maximum 50 value sets).
 - Temperature monitor function

General Specifications

Parameter	Specifications
Power supply	Four AA alkaline batteries, or special AC adapter (sold separately)
Battery life	Measurement off, output 5 V DC/10 kΩ or greater: Approximately 40 hours Simultaneous signal generation/measurement, output 5 V DC/10 kΩ or greater: Approximately 20 hours Simultaneous signal generation/measurement, output 20 mA/5 V: Approximately 12 hours (using alkaline batteries, with backlight off)
Auto-power-off function	Approximately 10 minutes (auto-power-off can be disabled through a DIP switch setting)
Applicable standards	IEC61010-1, IEC61010-2-31 EN61326-1 EN55011, Class B, Group 1
Operating temperature and humidity ranges	0–50°C, 20–80% RH (no condensation)
External dimensions (WHD)	Approximately 190 × 120 × 55 mm
Weight	Approximately 730 g (including batteries)

Measurement Unit

- Both CA51 and CA71

Parameter	Reference	Accuracy (23±5°C per year)	Resolution
DC voltage	100 mV	±(0.025% + 20 μV)	10 μV
	1 V	±(0.025% + 0.2 mV)	0.1 mV
	10 V	±(0.025% + 2 mV)	1 mV
	100 V	±(0.05% + 20 mV)	0.01 V
DC current	20 mA	±(0.025% + 4 μA)	1 μA
	100 mA	±(0.04% + 30 μA)	10 μA
Resistance	400 Ω	±(0.05% + 0.1 Ω)	0.01 Ω
AC voltage	1 V	±(0.5% + 5 dgt)	1 mV
	10 V		0.01 V
	100 V		0.1 V
	300 V		1 V
Frequency, pulse	100 Hz	±2 dgt	0.01 Hz
	1000 Hz		0.1 Hz
	10 kHz		0.001 kHz
	CPM		1 CPM
CPH	1 CPH		

- CA71 only

Parameter	Reference	Accuracy (23±5°C per year)	Resolution
TC	K	±(0.05% + 1.5°C) (-100°C or greater)	0.1°C
	E		
	J		
	T		
	N		
	L		
RTD	PT100	±(0.05% + 2°C) (-100°C or less)	1°C
	JPT100		
	R		
	S		
RTD	PT100	±(0.05% + 2°C) (100°C or greater) ±(0.05% + 3°C) (100°C or less)	1°C
	JPT100		
RTD	PT100	±(0.05% + 0.6°C)	0.1°C
	JPT100		

Source and Measuring of Voltage and Current



CA11E Specifications

- Source
DCV: 30/10/1-5/1 V/100 mV
DCA: 20/4-20 mA SINK
- Measurement
DCA: 30/10/1 V/100 mV
DCA: 20 mA
- General Specifications
- External dimensions: 192 (W) × 90 (H) × 42 (D) mm
 - Weight: Approx. 440 g
 - Power Supply: Four AA (R6) dry cells or AC adaptor

CA11E

Voltage/Current Calibrator

- Signal source:
DCV (Max. 30 V), DCA (Max. 24 mA)
- Measurement:
DCV (Max. 30 V), DCA (Max. 24 mA)
- Features:
Auto step (4 to 20 mA), 20 mA SINK, Sweep function, 24V (20 mA) / Loop check function

Simulator of Common Thermocouples and RTD Sensors



CA12E Specifications

- Source
TC: K/E/J/T/N/R/S/B/L/U
RTD: PT100/JPT100
100 mV, 400Ω
- Measurement
TC: K/E/J/T/N/R/S/B/L/U
RTD: PT100/JPT100
100 mV, 400Ω
- General Specifications
- External dimensions: 192 (W) × 90 (H) × 42 (D) mm
 - Weight: Approx. 440 g
 - Power Supply: Four AA (R6) dry cells or AC adaptor

CA12E

Temperature Calibrator

- Signal source:
TC, RTD PT100, 100 mV, 400Ω
- Measurement:
TC, RTD PT100, 100 mV, 400Ω

Digital Multimeter

733 series, 732 series, 73101

Provides Safety Levels Demanded in Field Work



733 Series

Digital Multimeters

3.5 digits (4,000-count, 40-segment bar graph display), Mean value type (73301, 73302), RMS type (73303)
 Measurement Functions: Voltage, Current, Resistance, Continuity Check, Diode Test, Frequency, Capacitance, Temperature
 Features: User calibration function (73302, 73303), Hi-impact overmold case

733 Series Specifications

		Accuracy: (23°C ±5°C, Less than 80% RH), ±(% rdg + dgt)					
Model		73301			73302		73303
Detection		Mean value			Mean value		Mean value/RMS value (changeover)
Item	Range	Accuracy					
DCV	400.0 mV/4.000 V/ 40.00 V/400.0 V/1000 V	0.3%+1			0.2%+1		
ACV	400.0 mV/4.000 V/ 40.00 V/400.0 V/1000 V	50/60 Hz	40 to 500 Hz	500 to 1 kHz	50/60 Hz	40 to 500 Hz	500 to 1 kHz
		0.5%+2	1%+2	1.5%+4	(73302) 0.5%+2	(73302) 0.75%+2	(73302) 1.5%+4
DCA	400.0 μA/4000 μA/ 40.00 mA/400.0 mA/ 4.000 A/10.00 A	1.0%+2(except for 4A/10 A) 1.2%+2(4A/10 A)			0.5%+2		
ACA	400.0 μA/4000 μA/ 40.00 mA/400.0 mA/ 4.000 A/10.00 A	50/60 Hz	40 to 1 kHz	50/60 Hz		40 to 1 kHz	
		1%+5 (except for 4A /10 A) 1.2%+2 (4 A/10 A)	1.5%+5	0.75%+5 (except for 4 A/10 A) 1.0%+5 (4 A/10 A)		1.5%+5	
Resistance	400.0 Ω/4.000 kΩ/ 40.00 kΩ/400.0 kΩ/ 4.000 MΩ/40.00 MΩ	0.5%+1 1.0%+2		0.4%+1 0.5%+1 1.0%+2		0.4%+1 0.5%+1 1.0%+2	
Frequency	10.00 99.99 Hz/90.0 999.9 Hz 0.900 9.999 kHz/9.00 99.99 kHz	-		0.02% + 1			

General Specifications

- External dimensions:
85 (W) × 191 (H) × 40 (D) mm
- Weight: Approx. 450 g
- Power Supply: Two AA (R6) dry cells

Low-cost Handheld DMM



732 Series

Digital Multimeters

3.5 digits (4,300-count), Mean value type
 Measurement Functions: Voltage, Current, Resistance, Continuity Check, Diode Test, Capacitance
 Features: Auto hold, Auto power-off

732 Series Specifications

		Accuracy: (23°C ±5°C, Less than 80% RH), ±(% rdg + dgt)			
Model		73201	73202	73203	73204
Detection		Mean value			
Item	Range	Accuracy			
DCV	400.0 mV/4.000 V/ 40.00 V/400.0 V/600 V	0.5%+1 0.75%+1	0.5%+1	0.3%+1	0.5%+1
ACV	4.000 V/40.00 V/ 400.0 V/600 V	1.0%+5		0.75%+5	
DCA	400.0 μA/4000 μA/ 40.00 mA/400.0 mA/ 10.00 A	1.0%+2 2.0%+2		-	
ACA (40 to 500 Hz)	400.0 μA/4000 μA/ 40.00 mA/400.0 mA/ 10.00 A	2.0%+20 2.0%+5 2.0%+20 2.0%+5 2.0%+20		-	
Resistance	400.0 Ω/4.000 kΩ/ 40.00 kΩ/400.0 kΩ/ 4.000 MΩ/40.00 MΩ			0.75%+2 0.75%+1 2.0%+1 5.0%+2	

General Specifications

- External dimensions:
74 (W) × 155 (H) × 31 (D) mm
- Weight: Approx. 240 g
- Power Supply:
Two AAA (LR03 or R03) dry cells

Pocket DMM with Superb Portability



73101

Pocket Digital Multimeter

4300 count display
 Continuity Check and Diode Test
 Auto Hold
 Auto Power Off

73101 Specifications

		Accuracy: (23°C ±5°C, Less than 80% RH), ±(% rdg + dgt)		
Item	Range	Accuracy	Input Resistance	
DCV	400.0 mV	1.2%+2	>100 MΩ	
	4.000 V	0.7%+1	11 MΩ	
ACV	40.00/400.0/600 V	1.2%+1	10 MΩ	
	4.000 V	2.0%+5	10 MΩ	
Resistance	400.0 Ω	1.2%+2		
	4.000 kΩ/40.00 kΩ/400.0 kΩ	2.0%+3		
	4.000 MΩ	1.2%+1		
	40.00 MΩ	5.0%+3		
Continuity check	400.0 Ω	-		
Diode test	2.00 V	1.5%+1	Open-circuit Voltage<3.4 V Testing Current<1.0 mA	

General Specifications

- External dimensions:
76 (W) × 117 (H) × 18 (D) mm
- Weight: Approx. 110 g
- Power Supply: Two LR-44 dry cells

Clamp-on Testers

Selection Guide, CL120, CL130/CL135, CL150/CL155, CL220

Model	Diameter of measurable conductor	Range	Accuracy	AC current	DC current	Leak current	DC voltage	AC voltage	Resistance	Continuity check	Frequency	True RMS	Output	Data hold	Peak hold	Filter
CL120	φ24	20 to 200 A	2.0+7	●										●		
CL130	φ33	200 to 600 A	1.5+6	●			●		●	●				●		
CL135	φ33	200 to 600 A	1.5+4	●			●		●	●		●		●		
CL150	φ54	400 to 2000 A	1.0+3	●			●	●	●	●			●	●	●	
CL155	φ54	400 to 2000 A	1.0+3	●			●	●	●	●		●	●	●	●	
CL220	φ24	400 to 300 A	1.0+4	●	●									●		
CL235	φ33	400 to 600 A	1.0+5	●	●		●	●	●	●	●	●		●		
CL250	φ55	400 to 2000 A	1.5+2	●	●		●	●	●	●			●	●		
CL255	φ55	400 to 2000 A	1.5+2	●	●		●	●	●	●		●	●	●	●	
CL320	φ24	20 mA to 200 A	2.0+4	●		●								●		●
CL340	φ40	40 mA to 400 A	1.0+5	●		●								●	●	●
CL345	φ40	40 mA to 400 A	1.0+5	●		●						●		●	●	●
30031	φ40	3 mA to 60 A	1.0+5	●		●								●		
CL360	φ68	200 mA to 1000 A	1.0+2	●		●							●	●	●	●

Light weight & compact design



- CL120**
Clamp-on Tester
- ACA
 - φ 24
 - AC/20 to 200A

CL120 Specifications

Item	Range	Accuracy: (23°C ±5°C, Less than 75% RH), ±(% rdg + dgt)	
		Range	Accuracy
ACA	200A	2.0+7 (50 to 1kHz)	
		2.0+5 (50/60Hz)	
	20A	3.0+10 (40 to 1kHz)	

Both AC/DC Current Measurement



- CL130/135**
Clamp-on Testers
- ACA
 - φ 33
 - AC/200 to 600A
 - AC V/Ω
 - RMS for CL135

CL130/CL135 Specifications

Item	Range	Accuracy: (23°C ±5°C, Less than 85% RH), ±(% rdg + dgt)	
		Range	Accuracy (CL130/CL135)
ACA	200A	1.5+6 (50/60Hz)	1.5+4 (50/60Hz)
		2.0+5 (40 to 1kHz)	2.0+5 (40 to 1kHz)
	600A	1.0+3 (50/60Hz)	1.5+4 (50/60Hz)
		2.0+5 (40 to 1kHz)	2.0+5 (40 to 1kHz)
ACV	200V/600V	1.0+2 (50/60Hz)	1.0+2 (50/60Hz)
Resistance	200Ω	1.5+4 (40 to 1kHz)	1.5+4 (40 to 1kHz)
		1.2+4, Beeps at below 30Ω (continuity check)	

Wide Range of Current Measurement



- CL150/CL155**
Clamp-on Testers
- ACA
 - φ 54
 - AC/400 to 2000 A
 - AC V/DC V/Ω
 - DC Output
 - RMS for CL155

CL150/CL155 Specifications

Item	Range	Accuracy: (23°C ±5°C, Less than 75% RH), ±(% rdg + dgt)	
		Range	Accuracy
ACA	400 A	1.0 + 3 (50/60 Hz)	
		2.0 + 3 (40 to 1 kHz)	
	2000 A (0 to 1500 A)	1.0 + 3 (50/60 Hz)	
		3.0 + 3 (40 to 1 kHz)	
	2000 A (1500 to 2000 A)	3.0 (50/60 Hz)	
ACV	40/400/750 V	1.0 + 2 (50/60 Hz)	
		1.5 + 3 (40 to 1 kHz)	
DCV	40/400/1000 V	1.0 + 2	
Resistance	400/4 k/40 k/400 kΩ	1.5 + 2, Beep sound at less than 50 ±35 Ω	

Both AC/DC Current Measurement



- CL220**
Clamp-on Tester
- ACA/DCA
 - φ 24
 - AC/40 to 300 A
 - DC/40 to 300 A

CL220 Specifications

Item	Range	Accuracy: (23°C ±5°C, Less than 85% RH), ±(% rdg + dgt)	
		Range	Accuracy
ACA	40 A	1.0 + 4	
		1.5 + 4	
	300 A (±20 to ±200 A)	3.0	
		1.0 + 4 (50/60 Hz)	
DCA	40 A	2.5 + 4 (20 to 1 kHz)	
		1.5 + 4 (50/60 Hz)	
	300 A (20 to 200 A)	2.5 + 4 (20 to 1 kHz)	
		3.5 (50/60 Hz)	
	300 A (200 to 300 A)	4.0 (20 to 1 kHz)	

Clamp-on Testers

CL235, CL250/CL255, CL320, CL340/CL345, CL360, 30031

RMS ACA/DCA measurement



CL235

Clamp-on Tester

- ACA/DCA
- ϕ 33
- AC/400 to 600A, DC/400 to 1000A
- AC V/DC V/ Ω /Hz
- RMS

CL235 Specifications

Item	Range	Accuracy: (23°C \pm 5°C, Less than 75% RH), \pm (% rdg + dgt)	
		Accuracy	
ACA	400/600A	1.5+5 (50/60Hz)	
		3.5+5 (40 to 1kHz)	
DCA	400/1000A	1.0+5	
ACV	40/400/600V	1.5+5 (50/60Hz)	
		3.5+5 (40 to 1kHz)	
DCV	40/400/600V	1.0+5	
Resistance	400/4000 Ω	1.0+5, Beeps at below 20 Ω (continuity check)	
Frequency	10 to 3000Hz	1.5+5	

Wide Range of ACA/DCA measurement



CL250/CL255

Clamp-on Testers

- ACA/DCA
- ϕ 55
- AC/400 to 2000A, DC/400 to 2000A
- AC V/DC V/ Ω
- DC Output
- Hz,RMS for CL255

CL250 Specifications

Item	Range	Accuracy: (23°C \pm 5°C, Less than 75% RH), \pm (% rdg + dgt)	
		Accuracy	
DCA	400/2000A	1.5+2	
		1.5+2 (50/60Hz)	
ACA	400A/2000A (0 to 1000A)	3.0+4 (40 to 500Hz)	
		5.0+4 (500 to 1kHz)	
		3.0+2 (50/60Hz)	
	2000A (1001 to 2000A)	3.0+2 (50/60Hz)	

CL255 Specifications

Item	Range	Accuracy: (23°C \pm 5°C, Less than 75% RH), \pm (% rdg + dgt)	
		Accuracy	
DCA	400/2000A	1.5+2	
		1.5+3 (50/60Hz)	
ACA	400A/2000A (150 to 1700A)	3.0+4 (30 to 1kHz)	
		3.5+3 (50/60Hz)	
		2000A (1701 to 2000A)	3.5+3 (50/60Hz)

Compact design of Leakage current measurement



CL320

Leakage Clamp-on Tester

- ACA
- ϕ 24
- AC/20mA to 200A

CL320 Specifications

Item	Range	Accuracy: (23°C \pm 5°C, Less than 85% RH), \pm (% rdg + dgt)	
		Accuracy	
		WIDE (40 to 400Hz)	50/60Hz
ACA	20mA/200mA	2.0+4 (50/60Hz)	
	200A (0 to 100A)	5.0+6 (40 to 400Hz)	3.0+5 (50/60Hz)
	200A (100.1 to 200A)	5.0+4 (50/60Hz)	5.0+5 (50/60Hz)

Leakage current measurement



CL340/CL345

Leakage Clamp-on Testers

- ACA
- ϕ 40
- AC/40mA to 400A
- RMS for CL345

CL340 Specifications

Item	Range	Accuracy: (23°C \pm 5°C, Less than 85% RH), \pm (% rdg + dgt)	
		Accuracy	
		WIDE (20Hz)	50/60Hz
ACA	40mA/400mA	2.5+10 (20 to 1kHz)	1.0+5 (50/60Hz)
	400A (0 to 350A)	2.5+10 (40 to 1kHz)	1.0+5 (50/60Hz)
	400A (350 to 400A)	5.0 (40 to 1kHz)	2.0 (50/60Hz)

CL345 Specifications

Item	Range	Accuracy: (23°C \pm 5°C, Less than 85% RH), \pm (% rdg + dgt)	
		Accuracy	
		WIDE (20Hz)	50/60Hz
ACA	40mA/400mA	2.5+10 (20 to 1kHz)	1.0+5 (50/60Hz)
	400A (0 to 300A)	2.5+10 (40 to 1kHz)	1.0+5 (50/60Hz)
	400A (300 to 400A)	5.0 (40 to 1kHz)	2.0 (50/60Hz)

Wide Range of Leakage current measurement



CL360

Leakage Clamp-on Tester

- ACA
- ϕ 68
- AC/200mA to 1000A
- DC/AC Output

CL360 Specifications

Item	Range	Accuracy: (23°C \pm 5°C, Less than 85% RH), \pm (% rdg + dgt)	
		Accuracy	
		WIDE (40 to 1kHz)	50/60Hz
ACA	20mA/2A/20A	1.0+2 (50/60Hz)	
		3.0+2 (40 to 1kHz)	1.5+2
		1.5+2 (50/60Hz)	
	200A	3.5+2 (40 to 1kHz)	2.0+2
		1.5+2 (50/60Hz)	
	1000A (0 to 500A)	3.5+2 (40 to 1kHz)	2.0+2
		5.0+2 (50/60Hz)	
	1000A (501 to 1000A)	10.0+2 (40 to 1kHz)	5.5

Leakage Currents of 1 mA measurement



30031

Leakage Clamp-on Tester

- ACA
- ϕ 40
- AC/3 mA to 60 A

30031 Specifications

Item	Range	Accuracy: (23°C \pm 5°C, Less than 80% RH), \pm (% rdg + dgt)	
		Accuracy	
ACA	0 to 30 mA	1.0 + 5 (50/60 Hz)	
	0 to 50 A	1.0 + 5 (50/60 Hz)	
	50 to 60 A	5.0 + 5 (50/60 Hz)	

Type	Series/Model	Suffix Code & Backlight	Rating	AC Voltage Measuring range	Display	Additional Function	
Digital Insulation Testers	MY40 CE	01 (EL-illuminated)	125V/200MΩ 250V/200MΩ 500V/2000MΩ 1000V/2000MΩ	0-600V	3 1/2-digit LCD	Automatic discharge Conductor resistance measurement Comparator function Memory function	
Analog Insulation Testers	2406E CE	31 (N/A)	25V/5MΩ	0-300V	Analog	Automatic discharge Battery check	
		41 (EL-illuminated)	50V/10MΩ 125V/20MΩ				
		32 (N/A)	125V/20MΩ				
		42 (EL-illuminated)	250V/50MΩ	0-300V			
		33 (N/A)	125V/20MΩ	0-600V			
		43 (EL-illuminated)	250V/50MΩ 500V/100MΩ				
		34 (N/A)	250V/50MΩ				
		44 (EL-illuminated)	500V/100MΩ 1000V/2000MΩ	0-600V			
		35 (N/A)	250V/500MΩ	0-600V			
	45 (EL-illuminated)	500V/1000MΩ 1000V/2000MΩ					
	36 (N/A)	500V/1000MΩ					
	Single range	MY10 CE	01 (afterglow-illuminated)	125V/20MΩ	0-250V	Analog	Automatic discharge Battery check
			02 (afterglow-illuminated)	250V/50MΩ	0-300V		
			03 (afterglow-illuminated)	500V/100MΩ	0-500V		
			04 (afterglow-illuminated)	500V/1000MΩ	0-500V		
			05 (afterglow-illuminated)	1000V/2000MΩ	0-500V		
	Single range	3213A	41 (N/A)	100V/20MΩ	0-150V	Analog	Battery check
			42 (N/A)	250V/50MΩ	0-250V		
43 (N/A)			500V/100MΩ	0-300V			
44 (N/A)			500V/1000MΩ	0-300V			
45 (N/A)			1000V/2000MΩ	0-300V			
46 (N/A)			125V/20MΩ	0-250V			

Digital model with 4 voltage/resistance ratings



MY40
Digital Insulation Tester

Features

- Multifunction
Insulation resistance, AC voltage and conductor resistance measurement
Insulation test mode: Comparator, memory, auto-hold and discharge functions
All test modes: Live-line alarm (excluding AC voltage measurement), battery check and automatic power-off
- Easy-to-view, fluctuation-free display
- Double-action safety mechanism

General Specifications

Dimensions: 125 (W) × 103 (H) × 53 (D) (mm), excluding protrusions
Weight: 420 g (main unit and batteries only, excluding accessories)
Batteries: Four AA (R6P) batteries

Testing Performance Specifications

Model	Rating	Range Option	Resolution	Measuring Range	Tolerance	Lower Limit of measured Ω	Rated Current	Central Scale Value
MY40-01	125V/200MΩ	.4000	.1kΩ	0-.0199MΩ	± (5% of rdg+6dgt)	0.125MΩ	1mA	5MΩ
		4.000	1kΩ	.0200-10.00MΩ*	± (2% of rdg+6dgt)			
		40.00	10kΩ	10.01-200.0MΩ	± 5% of rdg			
		200.0	100kΩ					
	250V/200MΩ	.4000	.1kΩ	0-.0499MΩ	± (5% of rdg+6dgt)	0.25MΩ	1mA	5MΩ
		4.000	1kΩ	.0500-20.00MΩ*	± (2% of rdg+6dgt)			
		40.00	10kΩ	20.01-200.0MΩ	± 5% of rdg			
		200.0	100kΩ					
	500V/2000MΩ	4.000	1kΩ	0-0.999MΩ	± (5% of rdg+6dgt)	0.5MΩ	1mA	50MΩ
		40.00	10kΩ	1.000-500MΩ*	± (2% of rdg+6dgt)			
		400.0	100kΩ	501-2000MΩ	± 5% of rdg			
		2000	1MΩ					
1000V/2000MΩ	4.000	1kΩ	0-1.999MΩ	± (5% of rdg+6dgt)	2MΩ	0.5mA	50MΩ	
	40.00	10kΩ	2.000-1000MΩ*	± (2% of rdg+6dgt)				
	400.0	100kΩ	1001-2000MΩ	± 5% of rdg				
	2000	1MΩ						

Standard test conditions

Ambient temperature/humidity ranges: 23 ±5°C/45-75% RH

Tolerances under the above-mentioned conditions:

Deviation from zero scale value: 6 digits maximum

Indication of ∞ mark on bar graph: Approx. 4000 MΩ min. (500 V/1000 V)
Approx. 400 MΩ min. (125 V/250 V)

Open circuit voltage: 130% max. of rated voltage

Rated measuring current: 1 mA (0 to 20%) when in first effective measuring range

Short-circuit Current: 2 mA max.

AC voltage measurement (45-400 Hz)

Model	Range	Resolution	Accuracy	Input Impedance
MY40-01	600V	1V	±(2% of rdg + 6dgt)	Approx. 2 MΩ

Conductor resistance measurement

Model	Range	Resolution	Accuracy	Open-circuit Voltage
MY40-01	400Ω	0.1Ω	±(2% of rdg + 8dgt)	Buzzer sound resistance: <40Ω.

* First effective measuring range; ** The minimum value at which the rated voltage can be maintained

Insulation Testers

2406E series, MY10 series, 3213A series

Analog models with two and three ratings



Features

- AC voltage measurement
- Automatic discharge
- Sky blue EL backlight
- Increased safety (covered battery charger)

General Specifications

Dimensions (main unit): Approx. 120 (W) × 110 (H) × 60 (D) (mm)
 Weight: Approx. 500 g (including batteries)
 Batteries: Six AA (R6P) batteries

2406E Series
 Analog Insulation Testers

Testing Performance Specifications

Model	Rating	Effective Measuring range	Central Scale Value	AC Voltage Measuring range	Lower limit of measured Ω	Rated Current
240631	25V/5MΩ	0.001–5MΩ	0.1MΩ	0–300V	0.025MΩ	1mA
240641	50V/10MΩ 125V/20MΩ	0.005–10MΩ 0.01–20MΩ	0.2MΩ 0.5MΩ	0–300V	0.05MΩ 0.125MΩ	1mA 1mA
240632	125V/20MΩ	0.01–20MΩ	0.5MΩ	0–300V	0.125MΩ	1mA
240642	250V/50MΩ	0.01–50MΩ	1MΩ	0–300V	0.25MΩ	1mA
240633	125V/20MΩ	0.01–20MΩ	0.5MΩ	0–600V	0.125MΩ	1mA
240643	250V/50MΩ	0.01–50MΩ	1MΩ	0–600V	0.25MΩ	1mA
240634	500V/100MΩ	0.05–100MΩ	2MΩ	0–600V	0.5MΩ	1mA
240634	250V/50MΩ	0.01–50MΩ	1MΩ	0–600V	0.25MΩ	1mA
240644	500V/100MΩ	0.05–100MΩ	2MΩ	0–600V	0.5MΩ	1mA
240644	1000V/2000MΩ	1–2000MΩ	50MΩ	0–600V	1MΩ	1mA**
240635	250V/500MΩ	0.1–500MΩ	10MΩ	0–600V	0.25MΩ	1mA**
240645	500V/1000MΩ 1000V/2000MΩ	0.5–1000MΩ 1–2000MΩ	20MΩ 50MΩ	0–600V	0.5MΩ 1MΩ	1mA** 1mA**

EL-backlit

Non-backlit

* The minimum value at which the rated voltage can be maintained;
 ** 0.55 mA in the case of the first effective measuring range

Analog models with single rating



Features

- AC voltage measurement
- Automatic discharge
- A wide choice of accessories
 –Designed for shared use with the MY40

General Specifications

Dimensions: Approx. 125 (W) × 103 (H) × 53 (D) (mm), excluding protrusions
 Weight: Approx. 400 g (main unit and batteries only, excluding accessories)
 Batteries: Four AA (R6P) batteries

MY10 Series
 Analog Insulation Testers

Testing Performance Specifications

Model	Rating	Effective Measuring Range	Central Scale Value	AC Voltage Measuring Range	Lower Limit of Measured Ω*	Rated Current
MY10-01	125V/20MΩ	0.01–20MΩ	0.5MΩ	0–250V	0.125MΩ	1–1.2mA
MY10-02	250V/50MΩ	0.01–50MΩ	1MΩ	0–300V	0.25MΩ	1–1.2mA
MY10-03	500V/100MΩ	0.05–100MΩ	2MΩ	0–500V	0.5MΩ	1–1.2mA
MY10-04	500V/1000MΩ	0.5–1000MΩ	20MΩ	0–500V	1MΩ	0.5–0.6mA
MY10-05	1000V/2000MΩ	1–2000MΩ	50MΩ	0–500V	2MΩ	0.5–0.6mA

* The minimum value at which the rated voltage can be maintained

Analog models with single rating



Features

- AC voltage measurement and check live lines such as motive power lines
- One-touch operation Press-and-lock switch for continuous measurement
- A wide choice of accessories to meet various testing requirements
- Vibration- and shock-resistant hand-held compact testers

General Specifications

Dimensions: Approx. 110 (W) × 180 (H) × 60 (D) (mm)
 Weight: Approx. 700 g including batteries, or approx. 1.2 kg including hard case, handle, test leads and batteries
 Batteries: Eight AA (R6P) batteries

3213A Series
 Analog Insulation Testers

Testing Performance Specifications

Model	Rating	Effective Measuring Range	Central Scale Value	AC Voltage Measuring Range	Lower Limit of measured Ω	Rated Current
321341	100V/20MΩ	0.02–20MΩ	0.5MΩ	0–150V	0.1MΩ	1mA
321342	250V/50MΩ	0.05–50MΩ	1MΩ	0–250V	0.25MΩ	1mA
321343	500V/100MΩ	0.1–100MΩ	2MΩ	0–300V	0.5MΩ	1mA
321344	500V/1000MΩ	1–1000MΩ	20MΩ	0–300V	0.5MΩ	1mA**
321345	1000V/2000MΩ	2–2000MΩ	50MΩ	0–300V	1MΩ	1mA**

* The minimum value at which the rated voltage can be maintained; ** 0.55 mA in the case of the first effective measuring range

Earth Tester

323511

Single Dial Measurement Without Range Change



323511

Earth Tester

- 3 terminal measurement of earth resistance
- Accurate, wide-range logarithmic scale
- AC potentiometer bridge, synchronous detector
- Portable yet rugged and shockproof

323511 Specifications

Measuring Range:
 Earth Resistance: 0 to 10 to 100 to 1,000 Ω
 Earth Voltage: 0 to 30 V

Scale:
 Earth Resistance: 3-digit logarithmic continuous scale on measuring dial
 Earth Voltage: Uniform scale on galvanometer

Accuracy:
 Earth Resistance: ±5% of 2 Ω in the range of 0 to 2 Ω
 ±2.5% of 20 Ω in the range of 2 to 20 Ω
 ±2.5% of 200 Ω in the range of 20 to 200 Ω
 ±5% of 1,000 Ω in the range of 200 to 1,000 Ω
 Earth Voltage: ±5% of full scale value

Measuring Frequency: 500 Hz

Ambient Temperature Influence: Variation in indication is within the corresponding one scale division for temperature change by 20±20°C.

Battery Voltage Influence: The accuracy is maintained within the specified limit even if the voltage decreases down to approx. 4 V under operating condition.

Earth Voltage Influence: Variation in indication is within the corresponding one scale division for the earth voltages of up to 10 V at commercial frequency.

Power Source: Four 1.5 V batteries

Insulation Resistance: More than 20 MΩ at 500 V DC between terminals and case

Dimensions: Approx. 122 × 190 × 124 mm not including accessories.

Weight: Approx. 1.5 kg for Instrument only.
 Approx. 3.5 kg including all accessories.

Leakage Current Tester

322610

Handy Universal Tester for Checking Electrical Appliances



322610

Leakage Current Tester

- Three input resistance ranges – 1, 1.5 and 2 kΩ
- Four functions – AC current, DC current, DC + AC current and AC voltage measurements
- ±2.5% full scale accuracy
- 100 μA full scale value
- Shockproof indicator using taut band movement
- Built-in overload protection circuit
- Handy and easy to carry
- Shielded case, resistant to high-frequency fields

322610 Specifications

Range: DC current ... 0.1, 1, 10 mA,
 AC current 0.1, 1, 10 mA,
 (DC + AC) current ... 0.1, 1, 10 mA,
 AC Voltage ... 150, 300 V (50 and 60 Hz)

Accuracy: ±2.5% of full scale value on current and voltage ranges

Input Impedance: Current range; 1 kΩ, 1.5 kΩ, and 2 kΩ
 Voltage range; More than 100 kΩ

Frequency Range: 20 Hz to 5 kHz

Power Source: Two 9 V dry cells,
 Continuous Operating Time; Approx. 290 hours

Overload Protection: Up to 30 mA AC for one minute will not damage instrument on current ranges

Dimensions: Approx. 190 × 124 × 90 mm not including handle
 Weight: Approx. 1.0 kg

Digital Illuminance Meters

510 series

Intensity of illumination can be adjusted at noon



510 Series

Digital Illuminance Meters

Measuring range: 9.99 (51002)/99.9/999/9,990/99,900/999,000 lx
 Accuracy: +/- (4% rdg + 1 dgt) (51001),
 +/- (2% rdg + 1 dgt) (51002)
 Features: Timer hold, Ripple measurement, Average illuminance computation function

510 Series Specifications

Photoelectric Element: Silicon Photodiode
 Measuring Range:
 0.0 to 99.9/999/9,990/99,900/999,000 lx
 Response Time: 5 sec. (Auto Range)
 2 sec. (Manual Range)
 Accuracy: ±4% rdg. ±1 dgt. (51001)
 ±2% rdg. ±1 dgt. (51002)

General Specifications

- External dimensions (main unit):
 Approx. 67 (W) × 177 (H) × 38 (D) (mm)
- Weight: Approx. 260 g
- Batteries: One 9 V 6F22(S-006P)

Digital Thermometers

TX10 series

1-channel Single-function to 2-channel Multifunction



TX10 Series

Digital Thermometers

TX1001:
 1-channel Single-function with data hold function

TX1002:
 1-channel Multifunction with data hold, internal memory, user-calibration and relative display function

TX1003:
 2-channel Multifunction with data hold, internal memory, user-calibration and relative display function

TX10 Series Specifications

- Thermocouple measurement ranges
 Type K: -200 to 1372 deg.C
 Type J: -200 to 1000 deg.C
 Type E: -200 to 700 deg.C
 Type T: -200 to 400 deg.C
- Resolution
 -200.0 to 199.9 deg.C: 0.1 deg.C, 200 deg.C: 1 deg.C (TX1001)
 -200.0 to 199.9 deg.C: 0.1 deg.C or 1 deg.C (when resolution is set at 1 deg.C), 200 deg.C: 1 deg.C (TX1002, 03)
- Accuracy
 -200.0 to -100.1 deg.C: +/- (0.1% of rdg + 1.0 deg.C);
 -100.0 to 199.9 deg.C: +/- (0.1% of rdg + 0.7 deg.C);
 200 deg.C and when resolution is set at 1 deg.C: +/- (0.2% of rdg + 1 deg.C)

General Specifications

- External dimensions:
 56 (W) × 151 (H) × 33 (D) mm
- Weight: Approx. 180 g
- Power: Two AA size (LR6) dry batteries

Thermo-Collectors

TM10, TM20

Temperature measurement and management of temperature data records



TM10/TM20

Thermo-collectors

- Effective for HACCP program implementation.
 - Collect up to 5000 data items with time-stamp, tag name and inspector name.
 - Save 2 weeks continuous data logging with 1 minute interval, (up to 20000 data items, measuring interval is 1sec. to 24 hours.)
- Information on **when**, by **whom** and **what** is measured is saved along with the data.

Optional Accessories for TM10/TM20

Product name	Model
RS-232C cable for PC connection (9-pin)	91011
Printer	97010
AC adapter for printer (Europe)	94006
AC adapter for printer (USA)	94007
Thermal paper for printer (10 rolls)	97080
RS-232C cable for printer connection	91010

Probes for TM10

90010 Standard Needle Probe
90013 Rounded end Probe (for Liquid)

- Measuring range: -30°C to 200°C

Temperature range (T)	Accuracy
-30°C ≤ T < -20°C	±1.0°C (Typical)
-20 ≤ °C ≤ 0	±0.5°C (Typical)
0 < °C < 100	±0.5°C
100 ≤ °C < 150	±1.0°C (Typical)
150 ≤ °C ≤ 200	±2.0°C (Typical)

- Response: Approx. 6 seconds for 90% of final value

90011 High-speed Needle Probe
90012 Surface Probe

- Measuring range: -30°C to 200°C

Temperature range (T)	Accuracy
-30°C ≤ T < -20°C	±2.0°C (Typical)
-20 ≤ °C ≤ 0	±1.5°C (Typical)
0 < °C < 100	±1.5°C (Typical)
100 ≤ °C < 150	±1.5°C (Typical)
150 ≤ °C ≤ 200	±2.5°C (Typical)

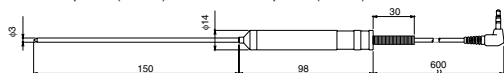
- Response: Approx. 2 seconds for 90% of final value (90011)
Approx. 6 seconds for 90% of final value (90012)

Note: The accuracy ratings above were obtained with the measurement of liquids being agitated.

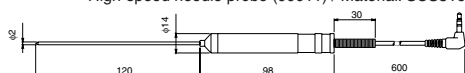
External Dimensions

TM10

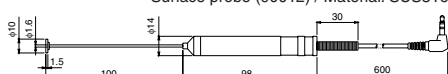
Standard needle probe (90010) / Rounded end probe (90013) / Material: SUS316



High-speed needle probe (90011) / Material: SUS316



Surface probe (90012) / Material: SUS316



Probes for TM20/TX10

Temperature Probe (for type K)

Model	Probe type	Measuring range	Accuracy	Response time (second)	Sensor Diameter / Length (m/m)
90020	rounded end	-50 to 600°C	0.4% or ±1.5°C	1.4	φ3.2 / 200
90021	rounded end	-50 to 600°C	0.4% or ±1.5°C	0.4	φ1.6 / 150
90022	rounded end	-50 to 600°C	0.4% or ±1.5°C	1.4	φ3.2 / 500
90023	needle	-50 to 500°C	0.4% or ±1.5°C	0.4	φ1.6 / 100
90024	needle	-50 to 500°C	0.4% or ±1.5°C	1	φ2.1 / 100
90030	Surface straight	-20 to 250°C	0.75% or ±2.5°C	2	φ15 (temp. sensing portion)
90031	Surface angled	-20 to 250°C	0.75% or ±2.5°C	2	φ15 (temp. sensing portion)
90032	Surface straight	-20 to 500°C	0.75% or ±2.5°C	2	φ15 (temp. sensing portion)
90033	Surface angled	-20 to 500°C	0.75% or ±2.5°C	2	φ15 (temp. sensing portion)
245907	Bead TC	-40 to 260°C	0.75% or ±2.5°C	1200 (included cord)	

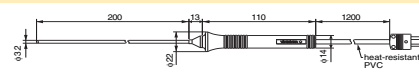
(90% response)

NOTE: 90030 is using polyimide to insulate from objects to be measured. Manufacturers of polyimide are announcing not to apply polyimide directly for food, internal and body fluid.

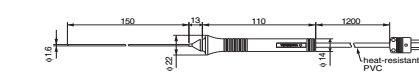
External Dimensions

TM20 TX10

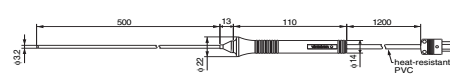
90020
Material:
SUS316



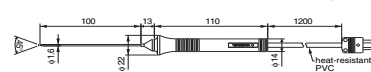
90021
Material:
SUS316



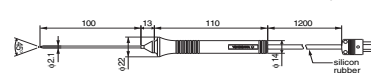
90022
Material:
SUS316



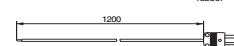
90023
Material:
SUS316



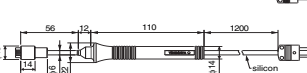
90024
Material:
SUS316



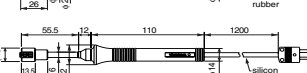
245907



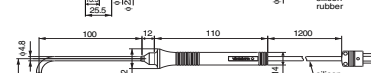
90030
Material: SUS316



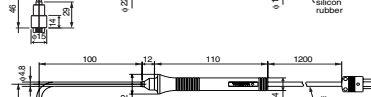
90032
Material: SUS316



90031
Material: SUS316



90033
Material: SUS316



Standard Resistors

2792A series

Metal foil resistors



2792A series Specifications

Model	Nominal value	Accuracy 23°C±2°C
2792A01	0.001 Ω	±100ppm
2792A02	0.01 Ω	±75ppm
2792A03	0.1 Ω	±50ppm
2792A04	1 Ω	±30ppm
2792A05	10 Ω	±30ppm
2792A06	100 Ω	±30ppm
2792A07	1 kΩ	±30ppm
2792A08	10 kΩ	±30ppm

Operating temperature and humidity ranges:
0-50°C / 20-80% RH

Maximum allowable power: 3 W

Test (calibrated) accuracy: ±5 ppm

Power characteristics: ±100 ppm/W

Insulation resistance:

More than 1000 MΩ at 500 V DC

Withstand voltage: 1.5 kV for one minute between measurement terminal and casing

Terminal construction: 4 terminals

External dimensions: Approximately φ104 × 150 mm (current terminal width: approximately 174 mm)

Weight: Approximately 1.2 kg

Accessories: User'S Manual, One Test Certificate

2792A series

Standard Resistors

- Traced to the national standard for high accuracy; test (calibrated) accuracy of ±5 ppm
- Resistance temperature coefficient
- A variety of models
Eight models with nominal resistance values ranging between 0.001 Ω and 10 kΩ
- Precision temperature control equipment, such as an oil bath, not needed for calibration due to marked improvement in resistance temperature coefficient
- Included document: Test certificate

Decade Resistance Boxes

279301/279303

High-accuracy, DC variable resistor with 6 dials



279301 Specifications

Resistance Range: 0.100 to 1,111.210 Ω (Minimum resistance is 0.100 Ω).

Dial Composition: 0.001 × 10 + 0.01 Ω × 10 + 0.1 Ω × 11 + 1 Ω × 10 + 10 Ω × 10 + 100 Ω × 10

Resolution: 0.001 Ω

Accuracy: ± (0.01% + 2 mΩ) at temperature 23 ± 2°C, humidity 45 to 75%, and 0.1 W power application

279301/279303

Decade Resistance Boxes

279301

- High accuracy and stability
- High reproducibility
- 1 mΩ resolution

279303

- Up to 100 MΩ in 100 Ω step
- Low voltage coefficient
- Shock- and vibration-proof construction

279303 Specifications

Resistance Range: 0 to 111.1110 MΩ.

Dial Composition: 100 Ω × 10 + 1 kΩ × 10 + 10 kΩ × 10 + 100 kΩ × 10 + 1 MΩ × 10 + 10 MΩ × 10.

Accuracy: 100Ω, 1 kΩ, 10 kΩ and 100 kΩ steps ... ± (0.05% + 0.05Ω)

1 MΩ and 10 MΩ steps ... ±0.2% (At temperature 23 ± 2°C, humidity below 75%, including residual resistance of approx. 0.05 Ω).

Decade Resistance Boxes

278610/278620

Quick and easy setting



278610/278620 Specifications

Available Models:

Model Number	Resistance Range
278610	0.1 to 111,111 Ω (six decade dials)
278620	1 to 1,111,110 Ω (six decade dials)

Residual Resistance: Less than 23 mΩ.

Power Rating: 0.3W/step, within 3W for overall instrument.

Maximum Allowable Input: 0.5W/step, 5W for overall instrument.

Maximum Circuit Voltage: 250 V.

Operating Temperature Range: 0 to 40°C

Storage Temperature Range: -10 to 50°C

Humidity Range: 25 to 85%, relative humidity.

Insulation Resistance: More than 500 MΩ at 500 V DC.

Dielectric Strength: 1,500 V AC for one minute.

278610/278620

Decade Resistance Boxes

Models 278610 and 278620 six-dial decade resistance boxes allow quick and easy setting of a wide range of resistance. These resistance boxes are used in combination with voltage or current standards to adjust voltage or current, as dummy load resistances or as an arm of AC bridges.

Slide Resistors

2791 series

Used in testing laboratory and industrial test



2791 series Specifications

Available Models:

Code	Nominal Value	Allowable Input Current
279101	4,800 Ω	0.18 A
279102	1,400 Ω	0.35 A
279103	600 Ω	0.5 A
279105	170 Ω	1.0 A
279108	39 Ω	2.0 A
279110	10 Ω	4.0 A
279112	4.7 Ω	6.0 A

Allowable Deviation: ±20% of nominal value.
Insulation Resistance: More than 5 MΩ at 500 V DC between terminal and case.

Dielectric Strength: 1,000 V AC for one minute between terminal and case.

2791 Series

Slide Resistors

Model 2791 is composed of resistance wire with an insulating coating wound on a frame of special ceramic and a sliding brush that maintains contact with the wire. Resistance is continuously variable and can be increased or decreased as desired.

Portable Wheatstone Bridge

2755

1Ω to 10MΩ by operation of dials and switches



2755

Portable Wheatstone Bridge

Model 2755 measures resistances from 1 Ω to 10 MΩ by operation of dials and switches. Batteries and a galvanometer are self-contained. The front control panel is provided with power and galvanometer circuit selectors, one ratio arm dial, and four measuring arm dials.

2755 Specifications

Measuring Range: 1,000 Ω to 10.00 Ω.

Measuring Arms: 1Ω × 10 + 10 Ω × 10 + 100 Ω × 10 + 1,000 Ω × 10 (min. one step: 1 Ω).

Ratio Arms (Multiplier): × 0.001, × 0.01, × 0.1, × 1, × 10, × 100, × 1,000 (M10, M100, M1000 ... Murray & Varley loop testing).

Accuracy: ±0.1% of reading on 100 Ω to 100 kΩ range, ±0.3% of reading on 10 Ω to 1 MΩ range, ±0.6% of reading on 1Ω to 10 MΩ range.

Temperature Coefficient of Resistance Elements:

±5 × 10⁻⁷/°C at ambient temperature of 5 to 35°C, ±2 × 10⁻⁵/°C at ambient temperature 20 to 35°C.

Galvanometer: Sensitivity ... 0.9 μA/div., internal resistance ... Approx. 150 Ω, external critical damping resistance ... Approx. 800 Ω, period ... within 1.5 seconds.

Power Source: Three 1.5 V batteries (built-in). Operating Temperature Range: 5 to 35°C.

Humidity Range: 85% max., relative humidity. Outer Case: ABS resin.

Accessory supplied at no extra cost: Carrying case.

Portable Double Bridge

2769

0.1mΩ to 110Ω with four plugs and one measuring dial



2769

Portable Double Bridge

Model 2769 is a compact, portable Kelvin double bridge designed for measuring low resistance from 0.1 mΩ to 110 Ω with four multiplication plugs and one measuring dial. It has built-in standard resistors, bridge power source and high-sensitivity taut-band suspension system electronic DC galvanometer.

2769 Specifications

Measuring Range: 0.1 mΩ* to 110 Ω.

Measuring Dial: 1.00 to 11.00 Ω at × 1.

Multipliers: × 0.0001*, × 0.001, × 0.01, × 0.1, × 1, × 10 (plug-in system).

Min. Division: 0.005 mΩ at × 0.0001*, 0.05 mΩ at × 0.001, 0.5 mΩ at × 0.01, 5 mΩ at × 0.1, 50 mΩ at × 1, 0.5 Ω at × 10.

Accuracy: ± (0.05 Ω × multiplier + 0.01 mΩ)

Current Rating: 10 A at × 0.0001* (0.01 Ω), 3A at × 0.001 (0.1 Ω), 1A at × 0.01 (1 Ω), 0.3A at × 0.1 (10 Ω), 0.1A at × 1 (100 Ω), 0.01A at × 10 (1,000 Ω).

Galvanometer: Built-in electronic DC galvanometer, voltage sensitivity ... approx. 20 μV/div.

sensitivity changeover; G₀ ... (Input resistance: approx. 11 kΩ).

G₁ ... approx. 1/11 of G₀ sensitivity. G₂ ... approx. 1/110 of G₀ sensitivity.

Operating Temperature Range: 5 to 35°C Humidity Range: Less than 85%

Bridge Power Source: Tow 1.5 V batteries, External power source is also usable.

*Note: Standard Resistor (Model 2771) is required for measurement on 0.1 to 1.1 mΩ range at 0.0001 multiplier.

Portable Instruments



201314



205206

2011 to 2053

Portable Instruments

- Compliance with JIS C1102-1997
- Taut-band suspension system eliminates friction and provides strong resistance to shock impact.
- Stable performance for long term use.
- Products have been widely used over many years as an industry standard at various customers such as industries, power plants, research laboratories and schools, etc.

Line-up

DC Ammeters and Voltmeters	2011, 2012
AC Ammeters and Voltmeters	2013, 2014
High-frequency AC Ammeters and Voltmeters	2016
Audio-frequency AC Voltmeters	2017
Frequency Meters	2038
Power Factor Meters	2039
Wattmeters	2041, 2042
Miniature DC Ammeters and Voltmeters	2051
Miniature AC Ammeters and Voltmeters	2052, 2053

Switchboard Instruments



2100A Series

Switchboard Instruments

- Compliance with JIS C1102-1997

Line-up

DC Ammeters and Voltmeters	2101A, 2181A
AC Ammeters and Voltmeters	2102A, 2182A 2105A, 2185A
Wattmeters	2106A, 2186A
Varmeters	2107A, 2187A
Power Factor Meters	2108A, 2188A
Frequency Meters	2109
Synchroscope	2109

Front Cover Dimensions (Width x Height mm)

210□A	110x110
218□A	80x80

Panel Meters



Clearline Series



FS,FL Series

* Cover with set pointer

Clearline Series and FS,FL Series

Panel Meters

- Compliance with JIS C1102-1997
- Clearline Series
Two types of movement suspension systems, Taut-band and Pivot & Jewel, are available to fit to various applications.
- FS,FL Series
High visibility by adopting clear front cover.

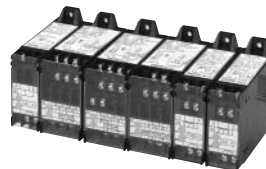
Line-up

• Clearline Series (2071 to 2076A, 2081 to 2086A, 2093A and 2094A)	DC Ammeters and Voltmeters, AC Ammeters and Voltmeters and Frequency Meters
• FS,FL Series	DC Ammeters and Voltmeters, AC Ammeters and Voltmeters, Frequency Meters, Wattmeters, Varmeters and Power Factor Meters

Front Cover Dimensions (Width x Height mm)

2071, 2081:	52x44
2072, 2082:	57x48
2073, 2083:	69x58
2074A, 2084A, FL80:	82x69 (FL80: 80x67)
2075A, 2085A, FL10:	102x85 (FL10: 100x83)
2076A, 2086A:	122x102
2093A, FS60:	60x60
2094A, FS80:	80x80
FS10:	100x100

0.5 Class Transducer for Power Applications



2370A Series

0.5 Class Transducer for Power Applications

- Compliance with JIS C1111-1989
- Available for DIN rail and panel mountings

Line-up

DC-DC isolator	2371A
AC Voltage, current (average rectified)	2372A
AC Voltage, current (RMS rectified)	2373A
AC Voltage, current (True RMS rectified)	2374A
Power	2375A
Reactive power	2376A
Phase	2377A
Power factor	2377A
Frequency	2378A

Dimensions (mm)

2371A, 2372A, 2373A, 2374A, 2378A:	127(H) x 40(W) x 130(D)
2375A, 2376A, 2377A:	127(H) x 55(W) x 130(D)

SALES/SERVICE OFFICES & REPRESENTATIVES

Worldwide Network

TMI: test and measurement

PCI: industrial automation and control

COMM: communication and network
(incl. former ANDO products)

NORTH AMERICA

■ U.S.A.

Yokogawa Corporation of America
TMI & PCI & COMM

Headquarters & Plant

2 Dart Road, Newnan
Georgia 30265-1094
Tel: (1)-800-888-6400 or (1)-770-253-7000
Fax: (1)-770-251-6427
URL: www.yokogawa.com/us/

■ CANADA

Electro Meters TMI
900 McKay Road, Unit 2
Pickering, Ontario L1W 3X8
Tel: (1)-905-428-3413
Fax: (1)-905-428-6086
URL: www.electro-meters.com

CB Engineering Ltd. PCI
TORONTO (East)
Unit #2, 110 Snow Blvd.
Vaughan ON L4K 4B8
Tel: (1)-905-760-9399
Fax: (1)-905-760-9319
URL: www.cbeng.com

Calgary (West)
#20, 5920 11th Street, SE
Calgary, AB T2H 2M4
Tel: (1)-403-259-6220
Fax: (1)-403-259-3377

CENTRAL & SOUTH AMERICA

■ ARGENTINA

Hertig S.A. TMI
Calle Bolivar, 1335
Buenos Aires
Tel: (5411)-4361-7136
Fax: (5411)-4300-3372

CV Control S.A. PCI
Av. Independencia, 3700
Buenos Aires
Tel: (5411)-4932-2322
Fax: (5411)-4932-1186

■ BOLIVIA

TRITEC S.R.L. TMI & PCI
Av. Oquendo, 0452 Edif. Santa Maria 4to.
Piso, Cochabamba
Tel: (591)-4425-6993
Fax: (591)-4425-0981

OMTEC S.R.L. TMI & PCI
B. Petrolero Guaracachi UV 80 C/E No. 88
Santa Cruz
Tel: (591)-3346-8439
Fax: (591)-3347-0516

■ BRAZIL

Yokogawa America Do Sul Ltda
TMI & PCI
Praça Acapulco, 31
04675-190
Sao Paulo/SP
Tel: (55)-11-56812400
Fax: (55)-11-55225231
URL: www.yokogawa.com.br/

■ CHILE

Y.E.W Chile Ltda TMI & PCI
Calle Rosario Sur, 91 Oficina 508
Las Condes Santiago
Tel: (56)-2-229-1513
Fax: (56)-2-229-0648

■ COLOMBIA

Soluciones Automatica TMI & PCI
Diagonal 152A, No.35 A-44
Bogota, DC
Tel: (571)-626-6668
Fax: (571)-216-1369

IA-INDUSTRIAL AUTOMATION

TMI & PCI & SYSTEMS
CLL 22F No.40 - 10 OFC. 301
Bogota
Tel: (571)-244-0804
Fax: (571)-269-6547

■ COSTA RICA

DITESA
Carretera Interamericana
Entrada a Cartago Barrio La Lima
Cartago
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Fax: (506)-573-7800
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