PSS® Programmable Safety and Control Systems

pilz

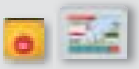
Programmable safety systems PSSmodular, PSScompact, decentralised I/O system PSSuniversal, safe bus system SafetyBUS p, wireless system InduraNET p, real-time Ethernet SafetyNET p

One system for safety and standard.

the spirit of safety

Business activities

Components

Sensor technology	▸ Safe proximity switches ▸ Safe rope pull switches ▸ Safety switches ▸ Safety bolts ▸ Safe hinge switches ▸ Safety gate systems ▸ Safety light beams/curtains/grids ▸ Camera-based protection and measuring systems ▸ Safe camera systems	
Control technology	▸ Relays for electrical safety ▸ Relays for functional safety ▸ Configurable control systems ▸ Compact programmable control systems ▸ Modular programmable control systems ▸ Decentralised periphery	
Networks	▸ Network components ▸ Industrial communication	SafetyNET p®
Drive technology	▸ Motion control systems ▸ Servo amplifiers ▸ Motors	
Operator and visualisation systems	▸ Control and signal devices ▸ Operator terminals	
Software	▸ System software and tools ▸ Application software	

Systems

Automation system PSS 4000	▸ Control systems ▸ Real-time Ethernet ▸ Software platform	 SafetyNET p® PAS 4000

Services

Consulting and engineering	▸ Risk Assessment ▸ Safety Concept ▸ Safety Design ▸ System Implementation ▸ Safety Validation	▸ CE Marking ▸ International Compliance Services ▸ Plant Assessment ▸ Inspection of ESPE	
Training	▸ Seminars ▸ Courses		

Support

Technical help round the clock!

Technical support is available from Pilz round the clock. This service is provided free of charge beyond standard business hours.

Americas
- Brazil
  +55 11 8245-8267
- Mexico
  +52 55 5572 1300
- USA (toll-free)
  +1 877-PILZUSA (745-9872)

Asia
- China
  +86 21 62494658-216
- Japan
  +81 45 471-2281
- Korea
  +82 2 2263 9540

Australia
- Australia
  +61 3 95446300

Europe
- Austria
  +43 1 7986263-0
- Belgium, Luxembourg
  +32 9 3217575
- England
  +44 1536 462203
- France
  +33 3 88104000
- Germany
  +49 711 3409-444
- Ireland
  +353 21 4804983
- Italy
  +39 031 789511
- Scandinavia
  +45 74436332
- Spain
  +34 938497433
- Switzerland
  +41 62 88979-30
- The Netherlands
  +31 347 320477
- Turkey
  +90 216 5775552

You can reach our international hotline on:

+49 711 3409-444
support@pilz.com

Pilz GmbH & Co. KG
Felix-Wankel-Straße 2
73760 Ostfildern, Germany

Telephone: +49 711 3409-0
Telefax: +49 711 3409-133
E-Mail: pilz.gmbh@pilz.de
Internet: www.pilz.com

Pilz – Complete automation

Total customer proximity

Pilz has a tradition as a family-run company stretching back over 60 years. Real proximity to customers is visible in all areas, instilling confidence through individual consultation, total flexibility and reliable service. Worldwide, round the clock, in 24 subsidiaries and branch offices.

Benefit-oriented innovations

Our customer proximity is the basis for our innovative strength. We are always oriented towards current market requirements, which is why we can offer innovative automation solutions in every case. Market leadership in safe automation secures our leadership in research and technology. Customer proximity and innovation belong together and are mutually dependent.

Overall solutions

Pilz is your solution supplier for all automation functions. Including standard control functions. Pilz developments protect man, machine and the environment. Our automation solutions incorporate our knowledge and experience from the stringent demands of safety technology, as well as the sum of our knowledge gained from over 60 years' experience of general automation technology.

All our experience and knowledge go into individual products and sophisticated system solutions.

- Sensor technology
- Control technology
- Networks
- Drive technology
- Operator and visualisation systems
- Software
- Automation system PSS 4000
- Consulting and engineering
- Training

the spirit of safety

With their knowledge, enthusiasm, creativity and courage to take the unconventional route, our staff have made us what we are today: one of the leading brands in automation technology.

More than 1 300 staff, each one of them an ambassador for safety, make sure that your company's most valuable asset – your staff – can work safely and free from injury.

Contents

Safe automation from Pilz

As flexible as your plant is

On complex machinery and distributed plants, PSS programmable safety and control systems monitor safety-related functions and/or undertake complete control of the machine – whether centralised or decentralised via the safe, open bus system SafetyBUS p.

Pilz PSS programmable safety and control systems control and monitor the widest range of applications worldwide. The comprehensive control system portfolio provides flexibility in the way devices are combined, so that numerous application options are covered.

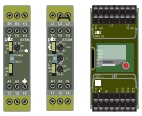
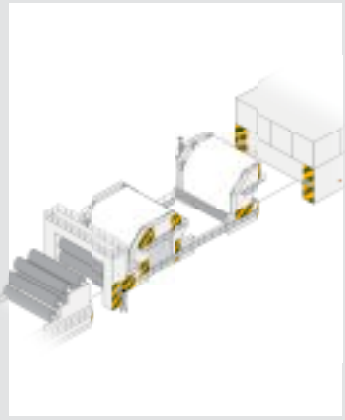
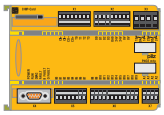
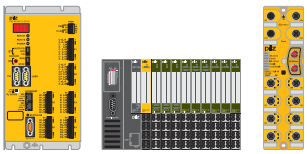
Innovation is our motto!
We work closely with customers to continually develop the PSS programmable safety and control systems. New technologies – such as the real-time Ethernet system SafetyNET p or the wireless InduraNET p system for industrial use – open up new horizons in control technology.

Solution suppliers for safety and standard

Pilz offers a universal concept for solutions that can be applied right across industry. Whether you need safety or standard control functions, machine or plant, centralised or decentralised, a single product or a total solution: With Pilz you will definitely find a solution for your automation function.

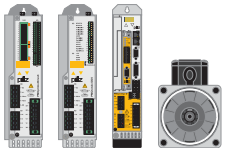
Are you looking for a flexible solution for your automation functions?

- **PMD:** Electronic monitoring relays such as voltage or true power monitors, for example.
- **PNOZ:** Safety relays for simple plant and machinery with up to four safety functions. Safe monitoring of emergency stops, safety gates and light curtains/ light grids, for example.
- **PNOZmulti:** The safety circuit is created using a simple configuration tool. Can be used from four safety functions.
- **PSS:** Programmable control systems for use on complex machinery or distributed plants, to monitor safety-related functions and/or for complete machine control.
- **Industrial communication:** Transfer input/output signals and control data reliably and safely.

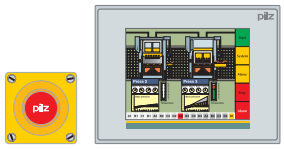
Your requirements:	Our solution:
	 *PMD relays for electrical safety*
	 *PNOZ relays for functional safety*
	 *PNOZmulti configurable control system*
	 *PSS programmable control systems*
	SafetyBUS p® indura NET p® SafetyNET p® *Industrial communication networks*

Supplementary product areas:

Sensor technology



Drive technology



Operator and visualisation systems

Software

Services

Products and systems for safety and standard

Besides “Control technology” and “Networks”, other product ranges also contain first-class components, which you can use individually or combine to form a system.

Sensor technology, used in conjunction with Pilz safe control technology, offers a co-ordinated, complete solution that’s economical, approved and safe. The focus is always on the protection of man and machine, in compliance with the standards and regulations.

Drive technology provides overall solutions for automating your machinery. From controller operation through to movement of highly dynamic drives, including all safety aspects.

Operator and visualisation systems provide diagnostic and visualisation devices, plus control and signal devices as part of the Pilz solution. The focus is always on fast, simple configuration. Machine downtimes are clearly reduced thanks to the overall diagnostic concept PVIS.

Software includes system software, user software and software tools. Here you’ll find the right tool for every task. From product-related software to diagnostic software, through to the PAScal Safety Calculator.

Automation system PSS 4000 for standard and safety is the ideal system for automation solutions in all industries. Reduce engineering effort and costs, now!

Services in the machine safety field are available from Pilz for all phases of the machine lifecycle: from identification of the danger points through to implementation of safety concepts and overall solutions. From risk assessment through to ESPE inspection. Pilz also offers a comprehensive range of training courses and seminars, covering generic issues relating to machinery safety as well as Pilz products.

The whole range of business activities at a glance:

Webcode 0326

Online information at www.pilz.com

PSS® – The solution for standard and safety

Safe, economical, powerful

You can use Pilz PSS programmable safety and control systems and the corresponding communication networks to implement the widest range of automation solutions – from the monitoring of safety-related functions through to the complete control of plant, machinery and process cycles.

Your requirements determine the system structure

- Stand-alone machine or plant
- Centralised or decentralised architecture
- Safety-related or standard control functions

Industrial communication

With Pilz industrial communication systems you can transfer input/output signals safely and reliably. Opt for the open, real-time Ethernet SafetyNET p, for example, which connects the drive, safety and control functions. Or you can network your plant and machinery using the safe, open bus system SafetyBUS p. As a further innovation, with the wireless system InduraNET p Pilz has developed a wireless solution for an industrial environment.

PSS programmable safety and control systems

PSS programmable safety and control systems are available in a compact or modular design, central and decentralised, for direct field application.

PSSmodular

For safety and control: Assemble your individual solution for centralised and decentralised tasks – in accordance with your requirements.

PSScompact

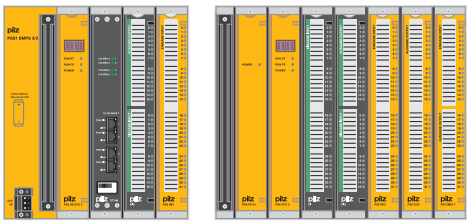
Six series covering safety and control: Benefit from an extensive selection of versatile, space-saving control solutions.

PSSuniversal

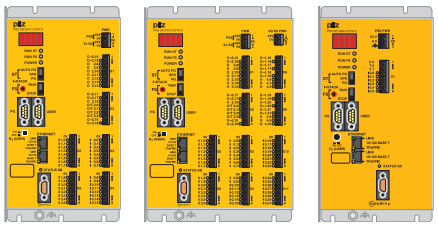
The decentralised I/O system for safety and control: Cover the complete input/output level with just one system.

System software for PSS programmable safety and control systems

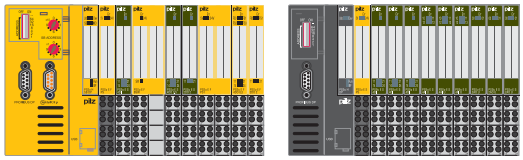
Practical software tools and an extensive selection of approved software function blocks provide support as you design and program your PSS safety and control systems – from planning through to diagnostics.



PSSmodular



PSScompact



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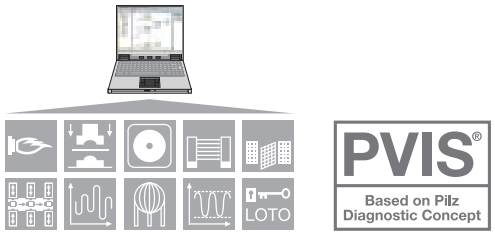


System software

Keep up-to-date on PSS programmable safety and control systems:

Webcode 0527

Online information at www.pilz.com

Backbone of safe automation

**Data transfer –
Safe and reliable**

Automation solutions are based on reliable communication networks. With its different networks, Pilz offers the solution for a range of requirements. Whether you want wireless data transfer or real-time – you're well advised to go for Pilz communication networks.

Thanks to interfaces to all other common fieldbus systems and Ethernet, you remain independent in your choice of control concept.

SafetyNET p – Real-time Ethernet for complete automation.

SafetyBUS p – The safe, open bus system.

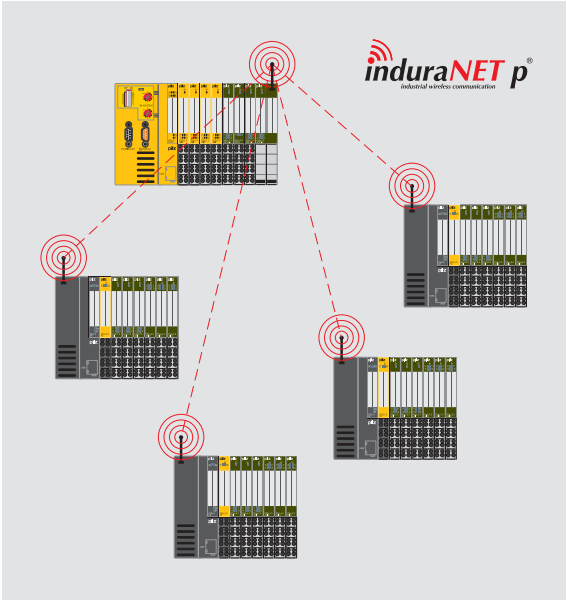
*InduraNET p – Reliable wireless technology
for the rugged everyday industrial environment.*

CANopen
EtherNet/IP
DeviceNet
INTERBUS
PROFIBUS
PROFINET

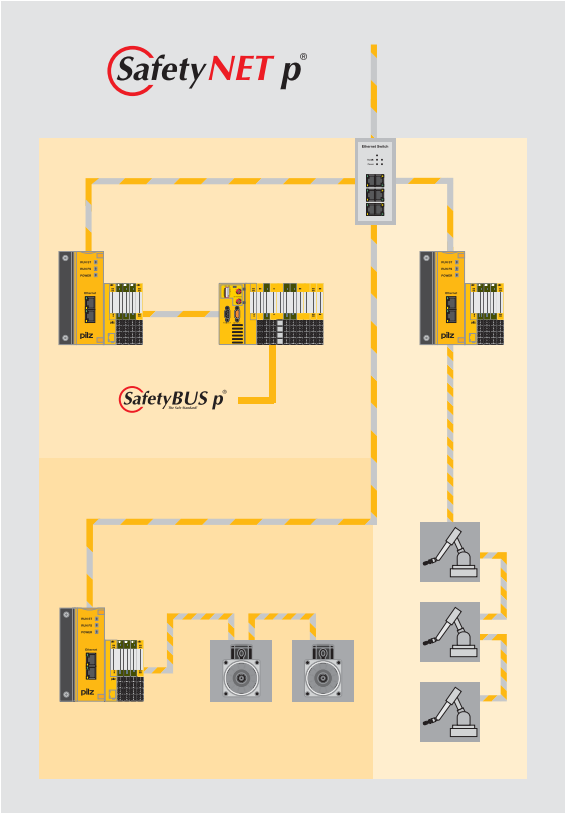
Optimum integration – Thanks to an open system connection.

Pilz network systems

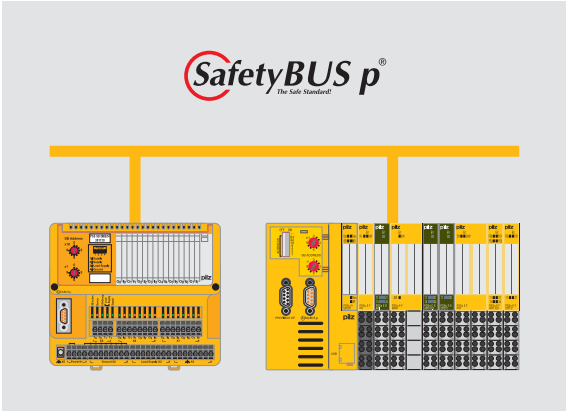
On large, complex and distributed plants, control signals are input/output directly in the field. This requires powerful, available automation networks.



- With the wireless InduraNET p system, which has been specially developed for industrial use, signals can be exchanged with mobile devices, for example.



- The open Ethernet system SafetyNET p can be used for the safe transfer of time-critical data as well as for standard communication of the complete plant control system. With dynamic applications, data is transmitted in real-time.



- With the safe, open bus system SafetyBUS p, time-critical information can safely be transmitted decentrally at field level.

Keep up-to-date on:

- *SafetyBUS p*

Webcode 2469

- *SafetyNET p*

Webcode 2541

- *InduraNET p*

Webcode 2605

Online information at www.pilz.com

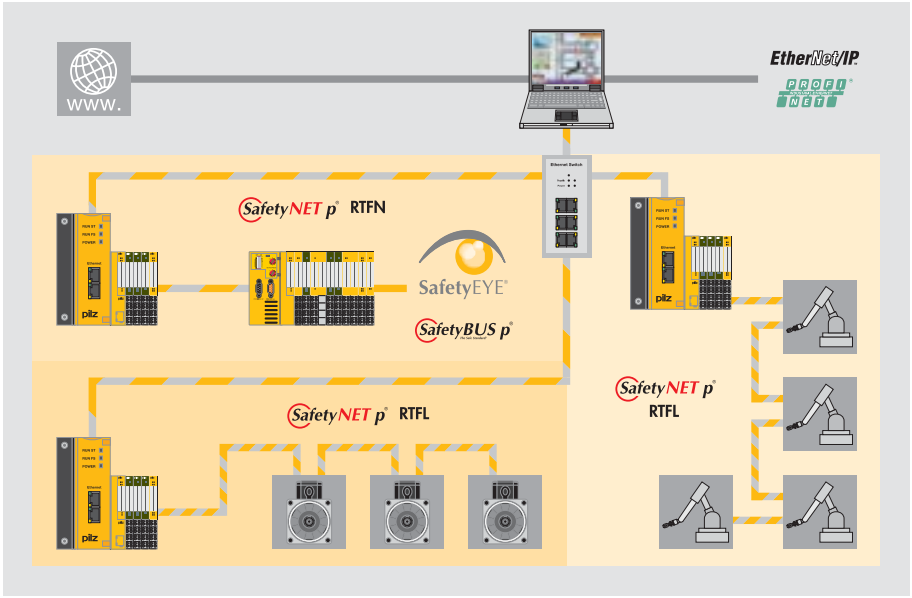
SafetyNET p® – Networking of plant and ma

Real-time Ethernet for complete automation

SafetyNET p is based on standard Ethernet and can be used simultaneously for real-time, standard and safety-related communication functions in industrial automation:

- For the safe transfer of time-critical, safety-related data
- For transferring information from the standard control process
- For real-time communication of all signals in highly dynamic, synchronised applications

All of a plant and machine's control functions are networked using a single system.



Investment protection and independence with an open system

- Existing SafetyBUS p and fieldbus installations can be connected to SafetyNET p and operate in co-existence
- Existing installations with other industrial Ethernet systems such as PROFINET and Ethernet/IP can be connected to SafetyNET p
- Any Ethernet device, e.g. PC, camera, printer, etc. can be connected to SafetyNET p; IP-based Ethernet utilities such as E-Mail, Internet or streaming can also be used across the network

New horizons in control technology

SafetyNET p enables new flexibility at optimum cost for complete networking of plant and machinery. So the system based on the Ethernet standard opens up new horizons in control technology:

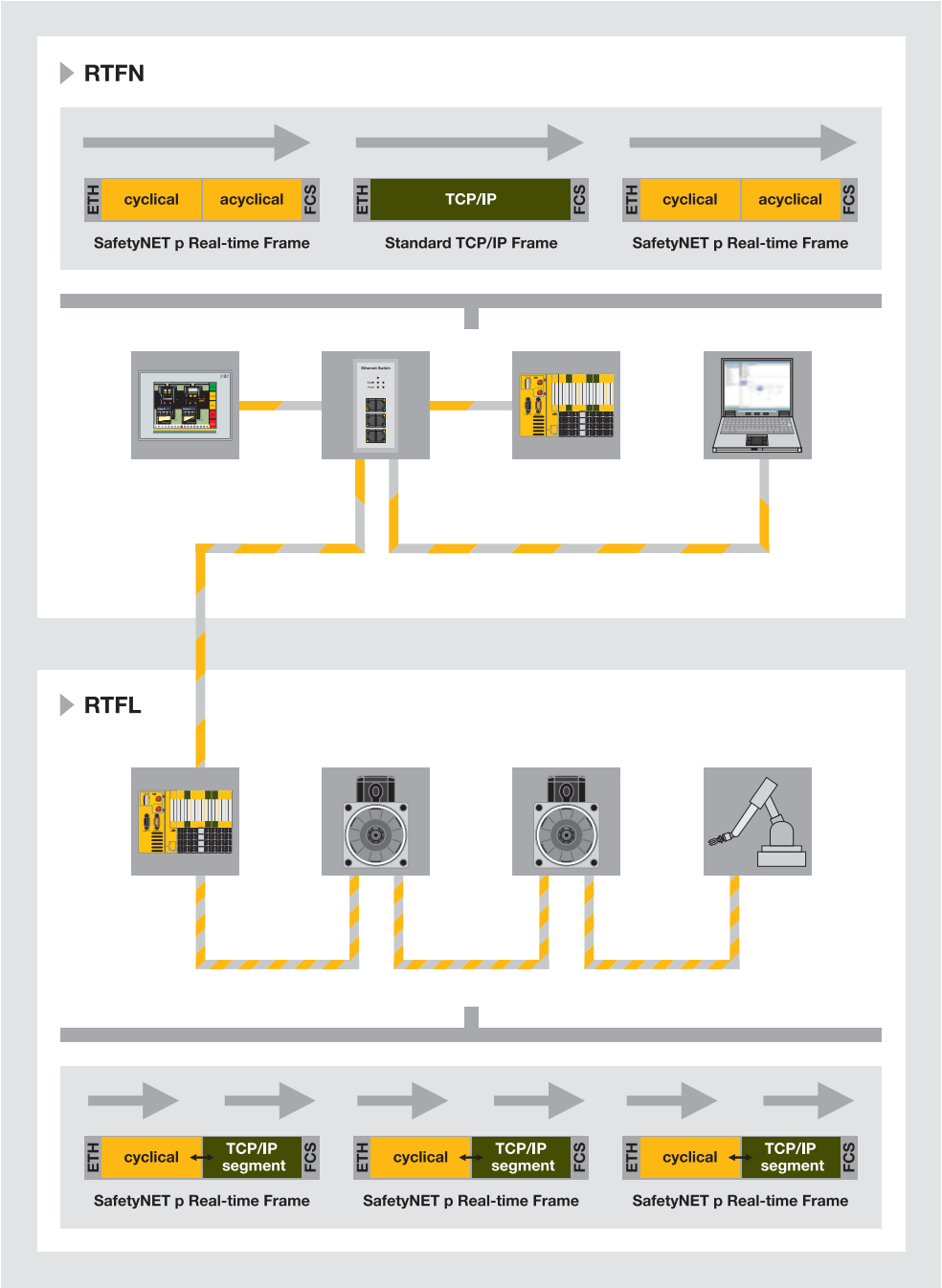
- Decentralisation of the control intelligence directly to field level
- Ability to maintain a centralised view
- Long-term, implementation of functional machine modules

chinery

Individually adaptable system standard with two speed classes: RTFN and RTFL

You can adapt SafetyNET p to the widest range of automation technology requirements and so achieve the optimum cost-benefit ratio for your network design, using just one system:

- For real-time communication in highly dynamic applications, e.g. on filling and packaging machinery, use the RTFL speed class (Real Time Frame Line) with deterministically guaranteed scan times of 62.5 µs and below
- For fieldbus class communication and for networking individual production cells, use the RTFN speed class with processing cycles of approx. 1 ms – this is designed for connecting a large number of subscribers and for large network extensions



SafetyNET p® – As flexible as your plant is

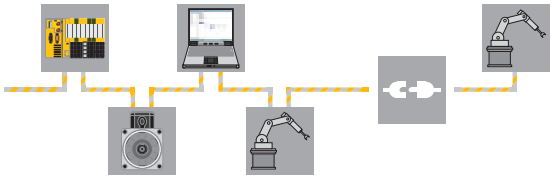
Flexible topologies and dynamic structures

SafetyNET p supports the widest range of topologies. The application options are many and varied:

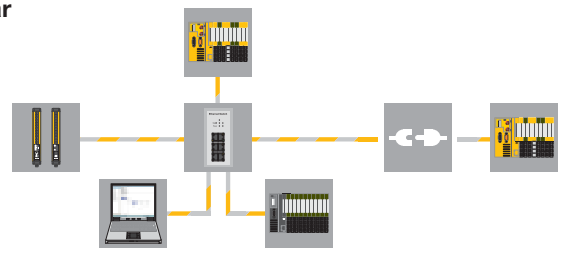
- Linear structure – optimised for rapid scan times and the integration of existing bus structures
- Star structure – data exchange via a central node (e.g. CPU), flexibility in the way devices can be connected and disconnected from the network
- Tree structure – combination of network segments with equal or varied performance, ideal for large, complex networks
- Ring structure – Redundancy is guaranteed; if a component should fail, a second route can be used

All of the structures are dynamic. Network subscribers can be deactivated and replaced without the need to reconfigure the network. So you can connect mobile devices if necessary, during maintenance and diagnostics for example, and implement variable configurations within the production process, e.g. tool change.

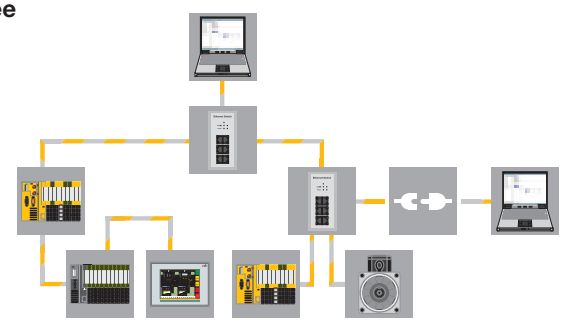
Linear



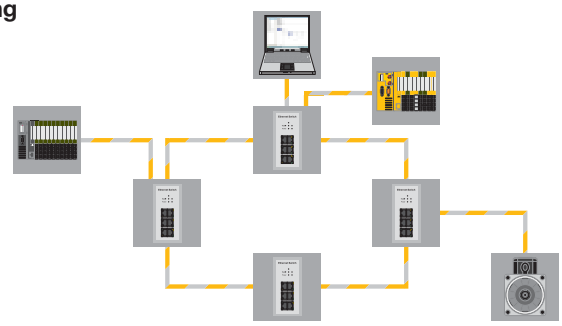
Star

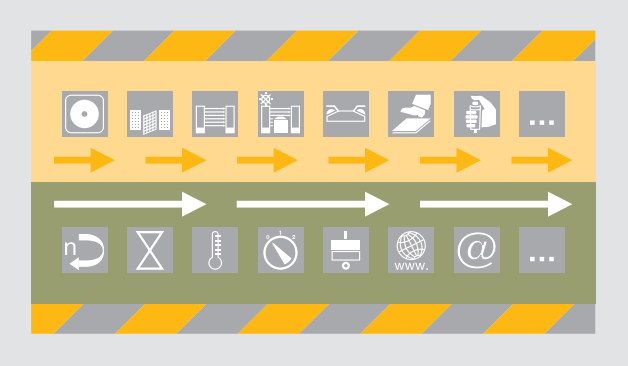


Tree



Ring



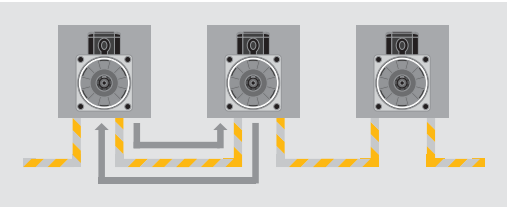


Safety right from the start

With SafetyNET p, the transfer of safety-related data and standard control information across a system is physically mixed but logically separate, and therefore free from feedback. The safety protocol is considered within the system right from the start and not just added later: The protocol structure guarantees stable network communication; telegrams containing safety-related information, such as a person entering a plant's danger zone, arrive safely at the intended recipient.

Your benefits at a glance

- Open, individually adaptable network solution for all automation functions
- Safety right from the start
- Based on the Ethernet standard
- Real-time communication for highly dynamic applications
- Flexible topology design
- Dynamic structures when swapping subscribers
- Short scan times of up to 62.5 µs
- High performance through cross-communication
- Open connection to existing system architectures



Keep up-to-date on SafetyNET p:

Webcode 2541

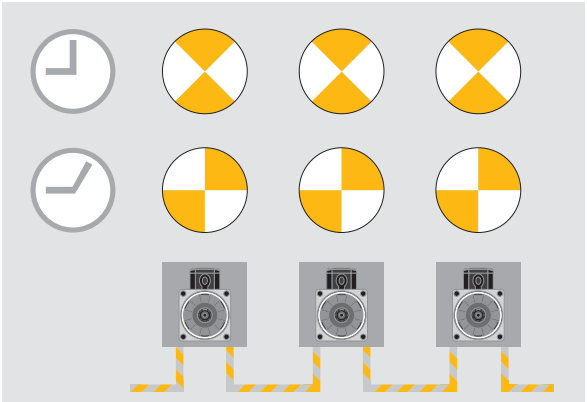
Online information at www.pilz.com

High performance through cross-communication

All network components have equal rights and can both use and provide utilities. Cross-communication enables the decentralised processing of data between two subscribers, without calling on a central instance (producer/consumer model). This saves time and increases the network performance.

Rapid reaction to time-critical events

When used with distributed real-time applications, information processing is synchronous in accordance with IEE 1588. A guaranteed system reaction occurs at a precisely definable time. With SafetyNET p networking, each device has a real-time clock with interrupt function to enable a rapid reaction to time-critical events.



SafetyBUS p® – Safe communication

In the fast lane with SafetyBUS p

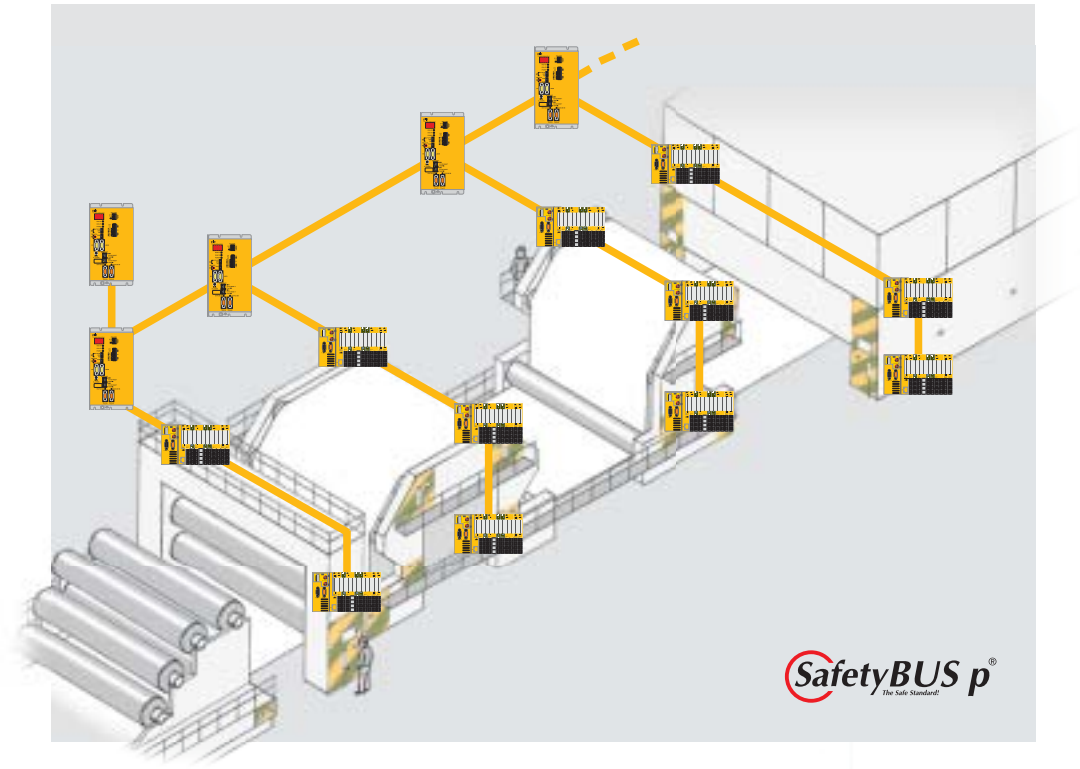
SafetyBUS p is used for the safe, fast transfer of time-critical information on decentralised control structures. In a range of industries, such as the automotive or packaging industry, for example.

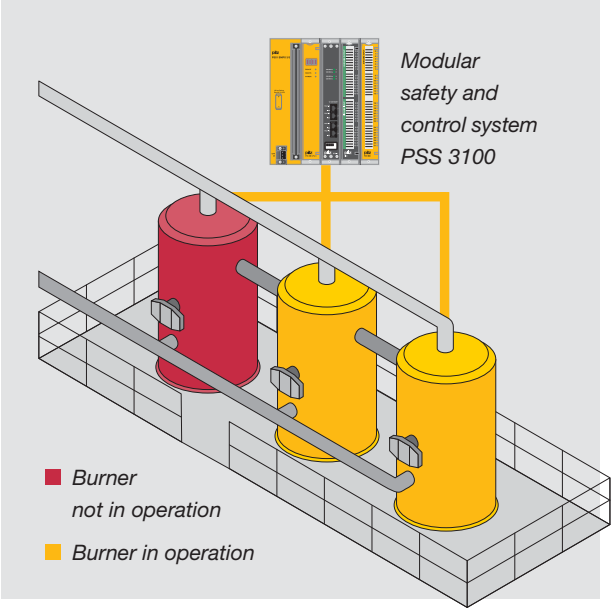
The bus system is based on the CAN fieldbus that is widely used worldwide and has an additional safety protocol that has been approved by TÜV and BG. So SafetyBUS p meets the increased requirements of a safety bus in terms of reaction times, safety and absence of feedback during signal transfer.

Parallel structure of safety bus and fieldbus

A plant's standard automation process must not be able to influence the safety functions in the case of an emergency. This guarantees safe communication with SafetyBUS p, without feedback.

Design guidelines issued by manufacturers and users often call for a strict separation of safety and standard control technology – particularly on hazardous process and manufacturing cycles. Separation guarantees transparency and the allocation of responsibility is clearly defined.





Few downtimes thanks to safe selective shutdown

Each SafetyBUS p subscriber can be assigned to a group. Within an application, plant sections that belong together logically can be configured as groups and switched off separately in the case of an error. The rest of the production cycle continues unhindered – enabling productive work practices. Generic functions, such as an emergency stop of the entire plant, are assigned to all groups. With up to 32 groups within a SafetyBUS p network, it is possible to build up complex structures.

Your benefits at a glance

- Decentralised, safe networking of sensors and actuators
- The safety technology does not have to be hard-wired, as the signal is transferred via the bus cable
- Meets the highest safety requirements in accordance with international standards
- Rapid reaction times to hazardous events thanks to event-driven communication
- Extremely short error reaction times of 25 ms and shorter
- Few downtimes thanks to integrated diagnostics
- Large network extension up to 4,032 inputs and outputs

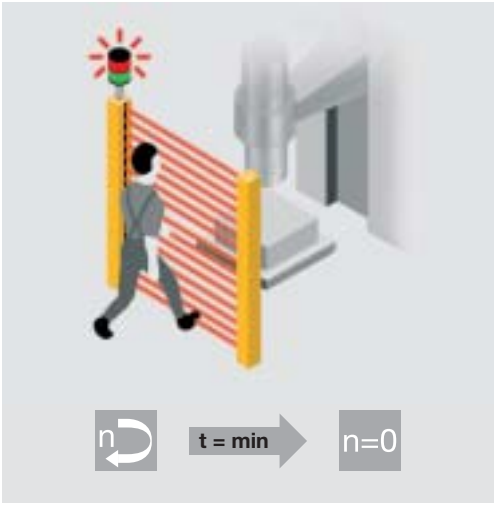
Keep up-to-date on SafetyBUS p:

Webcode 2469

Online information at www.pilz.com

Fast reaction times thanks to event-driven communication

SafetyBUS p operation is event-driven. This means that messages are only sent when the status changes at the centralised/decentralised inputs/outputs or at the bus subscribers. For this reason, SafetyBUS p is especially suitable for networking plants with different signalling rates and high reaction time requirements. Short reaction times have the additional advantage that protective measures (e.g. safety gates or light grids) can be positioned close to the danger zone – saving space and costs.



If a hazardous event occurs, the PSS programmable safety and control systems will react particularly quickly.

SafetyBUS p® – proven across industry

Visible success

The safe bus system SafetyBUS p is used for the safe, fast transfer of time-critical information on decentralised control structures. It is used across a range of industries in conjunction with PSS programmable safety and control systems:

Automotive industry – Monitoring production processes in the press shop, body plant, transmission, final assembly and paint shop

Cablecar technology – Monitoring the entire route, from entry to exit, distance between the cars and recognition of rope layers

Process technology – Safe monitoring and control of furnaces, monitoring valves, fill levels and fuel/air ratios

Conveyor technology – Safe track and load monitoring, collision detection on crane and harbour applications, container loading and lifting platforms

Airport automation – Flexible control and safe monitoring of filling stations, combined heat and power stations, rolling hangar doors, baggage handling systems and transport systems

Steel and aluminium processing – Safe monitoring during maintenance and restart

Packaging industry – Safe monitoring of filling, picking and packaging processes

Presses – Economical application on stand-alone presses or on press lines

Safety Network International e. V.

The open forum for safety and automation

Safety Network International e. V. is an independent organisation which, as well as promoting the proven SafetyBUS p system, also supports the Ethernet-based system SafetyNET p.

Members include users, integrators and manufacturers of both systems. The organisation was founded in 1999 and now has 70 member companies.

The work carried out by Safety Network International e. V. guarantees users and participating manufacturers that the SafetyNET p system will remain open and future-proof.

Tasks and projects:

- Investment protection for users and manufacturers through continual development and support of SafetyBUS p and SafetyNET p technology
- Sales promotion through active press relations and exhibition attendance
- Development of profiles and specifications to simplify handling of SafetyBUS p and SafetyNET p
- Quality assurance through the establishment of test laboratories, device certification, monitoring of interoperability and conformity
- Lobbying within standards committees and associations on behalf of the member companies of Safety Network International e. V.
- Assure worldwide propagation by influencing international standardisation

Machinery safety forum

With the machine safety forum, Safety Network International e. V. has created an important medium for providing quick, effective communication regarding changes within the standards field and new regulations.

Safety Network Academy

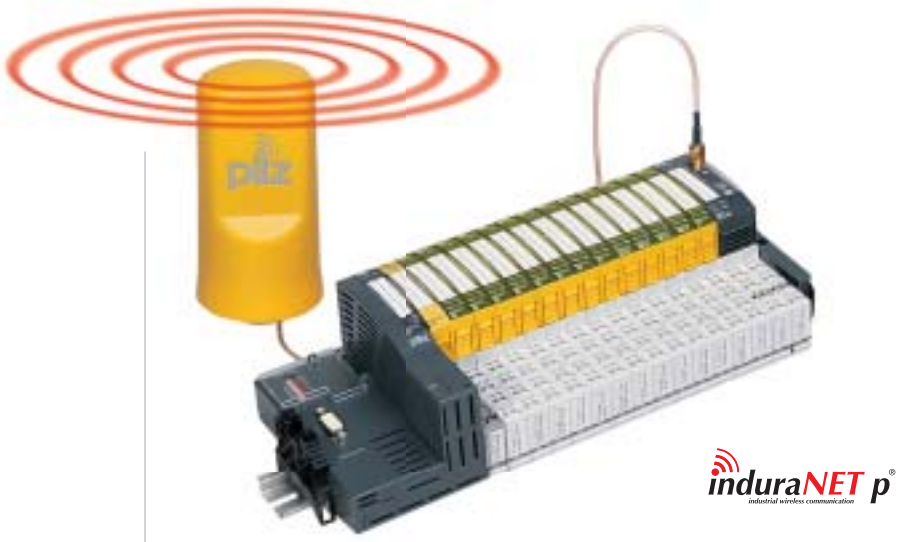
Safety Network International e. V. promotes the Safety Network Academy in conjunction with its member organisations. The network's aim is to encourage knowledge transfer among the participating institutions and organisations.

Safety Network integration

As the umbrella organisation for SafetyBUS p and SafetyNET p, Safety Network International e. V. hosts events to present automation suppliers with options for implementing these technologies in their own devices and components.

Find out more about Safety Network International e. V.: www.safety-network.de

InduraNET p® – Reliable wireless technolo

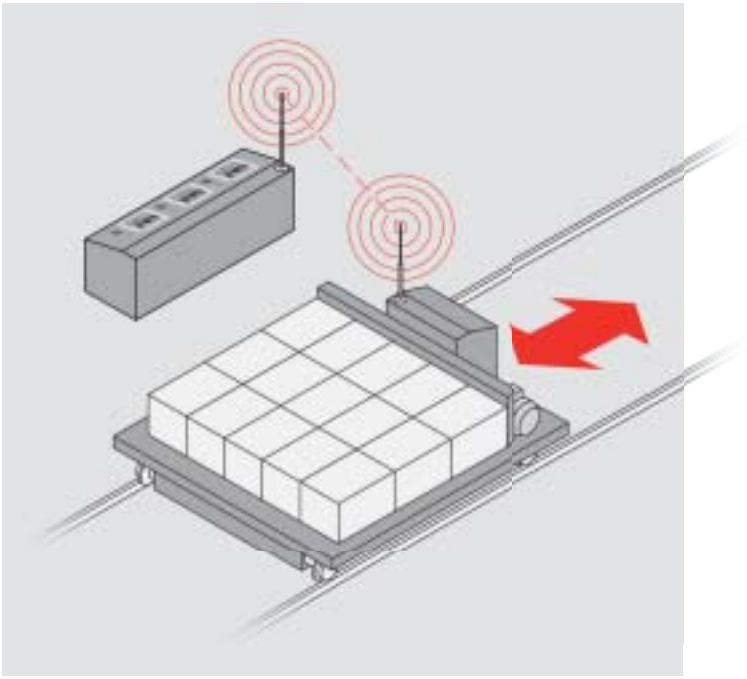


A different way of broadcasting

The wireless system InduraNET p (Industrial Radio Network) is specifically designed for use in an industrial environment. Anywhere that a cable-based solution is difficult if not impossible to install, InduraNET p can help. Key features include a particularly robust communication technology, high availability due to a new type of antenna system and a high coexistence capability with other wireless services.

Wireless compensates for the disadvantages of contact-based solutions

Mobile devices frequently use trailing cable and drag chains, rotary transformers and slip ring transmitters, as well as data light beam devices and cables. These moving parts are subject to wear, maintenance intensive and complex to install. With its special technology, the wireless InduraNET p system compensates for the weaknesses of contact-based solutions.

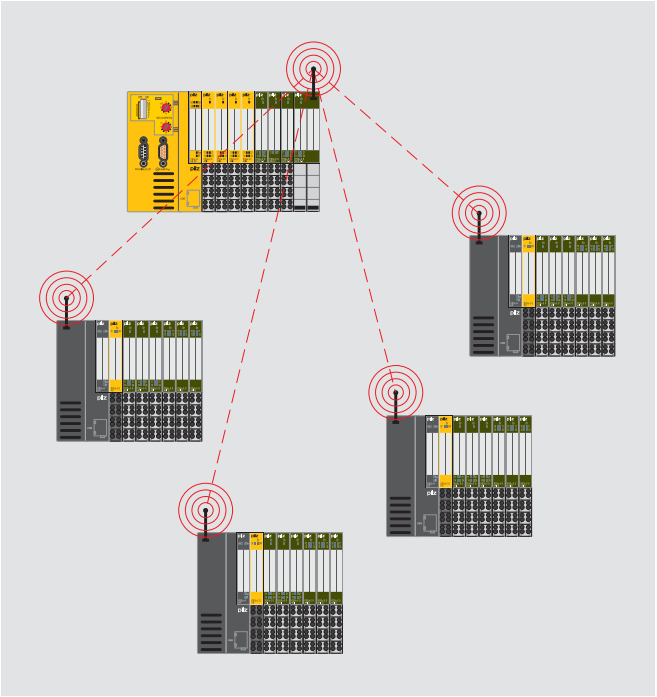


Wireless signal transfer via InduraNET p in plants with moving parts.

gy for industry

System solution with PSSuniversal

InduraNET p is integrated within the decentralised I/O system PSSuniversal. A module is incorporated into the base station in order to be able to use the wireless technology. All remote stations follow the slot addressing of the base station, without occupying a slot themselves. The head module on the base station "sees" all the remote components as a series of electrical modules. Up to four remote stations that are used in parallel can be connected to each base station.

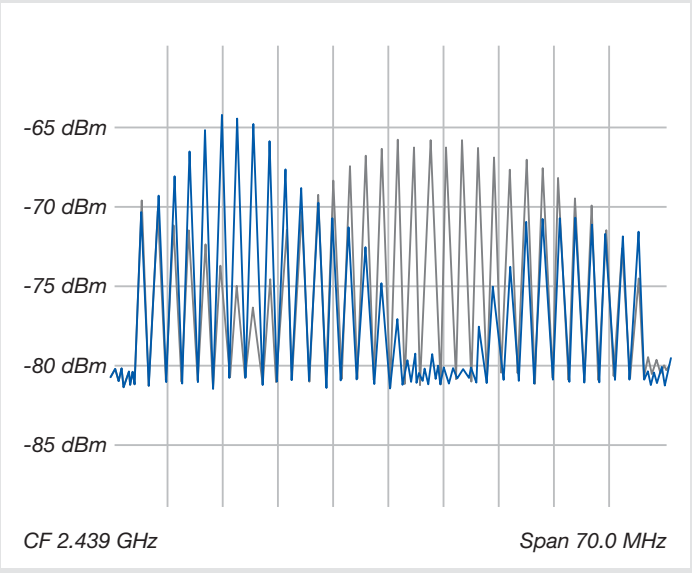


Decentralised signal transfer via InduraNET p – Centralised view of a decentralised structure.

The wireless modules, antennas etc. for the decentralised I/O system can be found on page 54/55.

High availability thanks to a special antenna system

Antennas are required to enable the PSSuniversal head modules to process wireless information. Both a single and a dual antenna are available for InduraNET p. The dual antenna contains multiple subantennas, from which the best receiver at any given time can be used. This compensates for any interference in the wireless zone. The dual antenna is mainly used where communication conditions are poor.



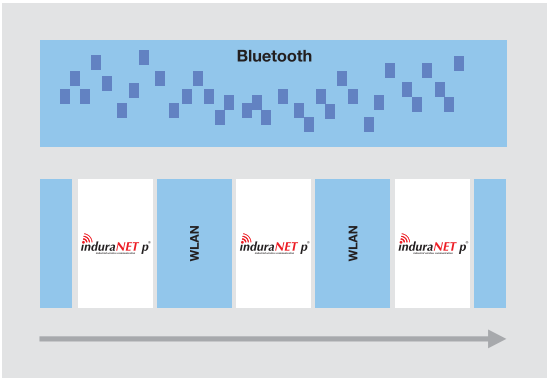
Consistently high reception quality: If one subantenna is barely able to receive a usable signal, the other antenna will have a good signal.

Keep up-to-date on InduraNET p:

Webcode 2605

Online information at www.pilz.com

InduraNET p® – Innovative wireless system



Coexistence with other wireless services.

Your benefits at a glance

- Easy accessibility within the zone, which would not be achievable with such flexibility using a cable connection
- Particularly robust communication technology
- Constant high quality wireless connection thanks to the innovative antenna system
- Coexists with other wireless services thanks to intelligent frequency management
- Easy to expand the existing infrastructure, so the work involved in project configuration and installation is reduced
- Licence-free, uses the free worldwide ISM frequency bands
- Cost savings, as there is less planning, installation and maintenance work

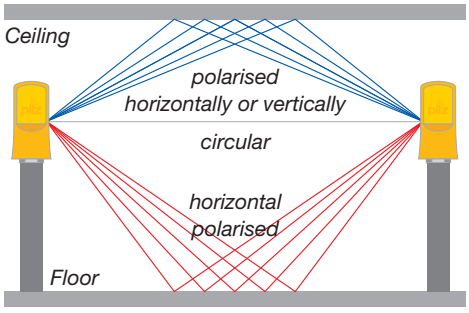
Keep up-to-date on InduraNET p:

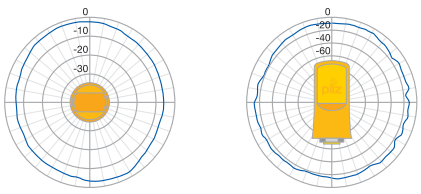
Webcode 2605

Online information at www.pilz.com

Coexistence with other wireless services

Unlike Bluetooth wireless systems, for example, InduraNET p does not influence any other industrial wireless systems thanks to its intelligent frequency management (CFM). In addition to the protocol mechanism, the access mechanism “Listen before talk” guarantees that the radio channel is available and is not in use by any other wireless services. At the same time, the WLAN channels that are identified as busy are permanently “marked” and hidden. This means that collisions or mutual interference with WLAN are excluded.





Receive diagram horizontal

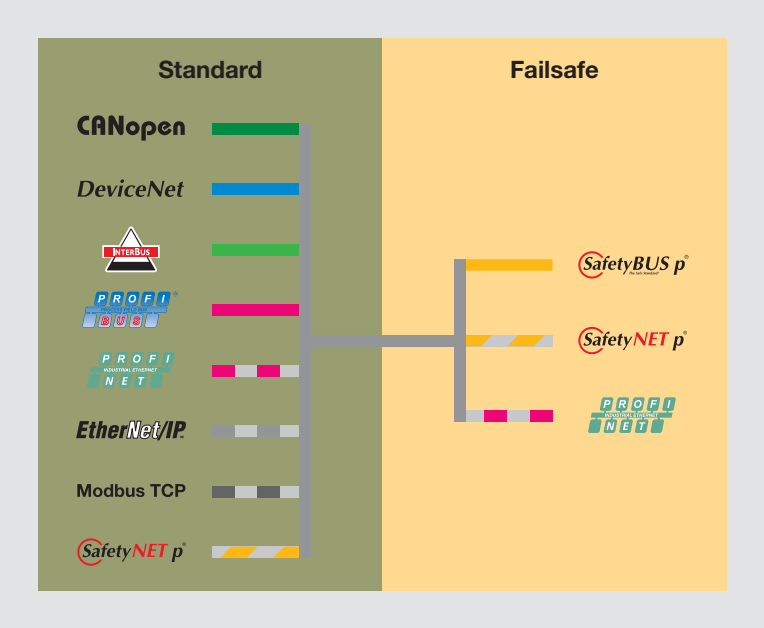
Receive diagram vertical

Environment influences wireless quality

Walls, suspended ceilings, shelves, door and window frames and insulating glass panels can all produce attenuation or reflection that would affect wireless communication in the 2.4 GHz ISM band. To achieve a wide operating range and constant availability, it's important to establish the optimum installation site for the antenna. Analysis methods and tools available with InduraNET p enable the signal’s field strength to be assessed quite easily. The high reception dynamic of InduraNET p also compensates for physical properties such as reflections, which may lead to errors.

Appropriate antenna technology compensates for multipath fading and reflection.

Networks – Open, safe, economical



Networks – Reliable data transfer medium

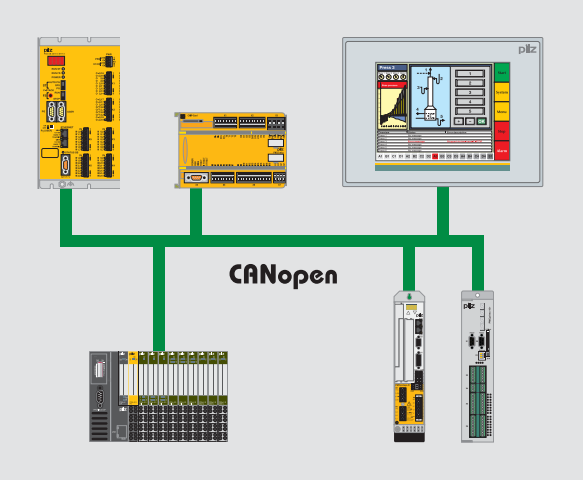
The openness and flexibility of individual bus systems and their various topologies enable you to incorporate systems and their add-ons. The use of standardised bus systems means that standard-compliant components made by a variety of manufacturers may easily be connected. You can quickly and easily integrate PSS programmable safety and control systems into existing architectures or adapt them to suit changed system requirements. That way you maintain your independence in your choice of control concept.

Ethernet interface ETH-2 – Remote diagnostics

Lengthy travel times are now a thing of the past. When servicing is required, diagnostic data can be accessed simply and quickly from a remote location via the ETH-2 Ethernet interface on the PSS programmable safety and control systems PSS (PSS 3047-3 ETH-2, PSS SB 3047-3 ETH-2 and PSS SB 3075-3 ETH-2). Complete networks can be built up thanks to its master functionality.

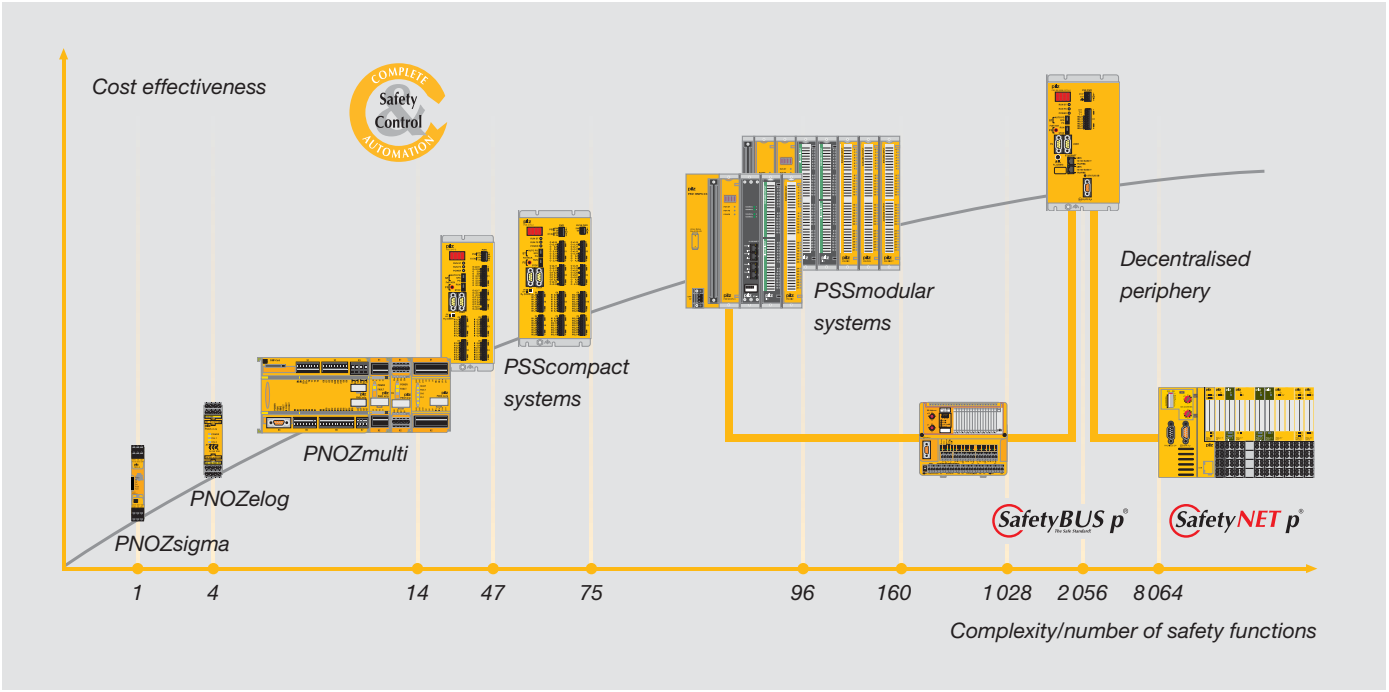
The complete solution for your automation function with CANopen

Combined with PSS programmable safety and control systems and other products with CANopen interfaces, you now have total flexibility in your applications. Pilz offers a co-ordinated solution comprising control system, actuator technology and visualisation.



Complete solution from Pilz with CANopen.

Intelligent, future-proof control



The appropriate solution – meeting your exact requirements: For simple plants with up to four safety functions, safety relays PNOZ X, PNOZsigma or PNOZelog; for four safety functions and above, the PNOZmulti safety system; for complex plant and machinery, PSS programmable safety and control systems.

The appropriate solution for every requirement

With the extensive control portfolio from Pilz you can cover a wide range of applications. PSS programmable safety and control systems are the ideal solution for safety-related and standard control functions:

- For complex stand-alone machines with high safety requirements, such as presses
- For interlinked plants with decentralised networking, such as packaging machines
- For complete plant lines with decentralised networking, such as transfer lines

Intelligent, future-proof investment

The complete solution from Pilz is perfectly compatible. The programmable safety and control systems are subject to continuous development, based on many years of experience and in constant consultation with customers, guaranteeing long-term investment protection. Thus they meet both current and future requirements for safe, economical automation solutions. In addition to the PSS product group, the Pilz portfolio also includes the PNOZ product group, which also stands for safe control.

Keep up-to-date on PNOZ safety relays:

Webcode 0199

Online information at www.pilz.com

Standards for safety

Compliance with international safety standards

Pilz's thorough expertise in safety technology pays off. PSS programmable safety and control systems meet the highest safety requirements and therefore comply with international standards for machine safety:

- EN 954-1 up to Category 4
- EN/IEC 61508 up to SIL CL 3
- EN/IEC 62061 up to SIL CL 3
- EN ISO 13849 up to PL e
- EN 60204-1
- NFPA 79

Represented in various industries

The programmable safety and control systems are easy to use in the most wide-ranging applications and industries. They comply with various application-specific standards.

Presses
EN 692,
EN 693,
EN 12622

Traffic systems
EN 50126,
EN 50128,
EN 50129
each to SIL CL 3,
EN 50159-1,
EN 50159-2

Cablecar technology
EN 13243 AK4

Burner management, process technology
EN 289

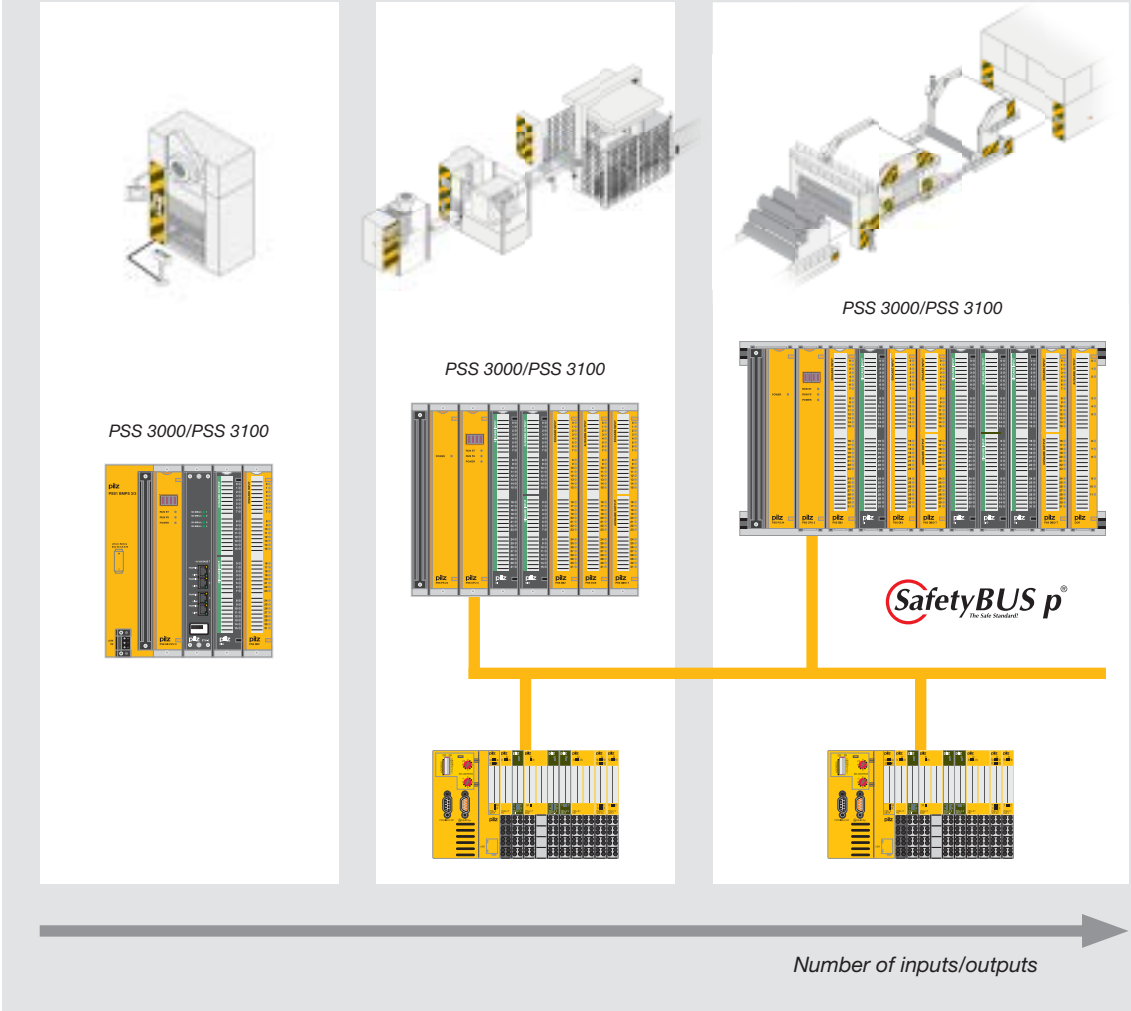
PSS programmable safety and control systems are approved by BG, TÜV and UL/cUL.

Keep up-to-date on laws and standards:

Webcode 0240

Online information at www.pilz.com

PSSmodular systems



PSS 3000 and PSS 3100 – Make your control solution flexible and individual.

Two series covering safety and control: PSS 3000 and PSS 3100

The modular safety and control systems PSS 3000 and PSS 3100 monitor safety-related functions and perform standard control functions at the same time:

- Centrally – on complex, independent stand-alone machines, or
- Decentrally – on interlinked plants extending over a wide area

Communication interfaces to fieldbus systems, to the safe, open bus system SafetyBUS p and to Ethernet, enable the units to be integrated quickly into the plant's full control sequence.

When do I use which system?

The PSS 3000 modular system is suitable for rugged application conditions, e.g. for press controllers, fairground rides or in cablecars. All components feature a sturdy aluminium housing and can withstand increased mechanical loads. In applications requiring a large number of standard inputs and outputs, additional standard I/O modules can be added to the PSS 3000 via 2 expansion module racks.

On the PSS 3100, the modules are not enclosed in a housing and the printed circuit boards are visible, so they are suitable for production environments with low mechanical stress.

Modular hardware structure

Just assemble the hardware components to match your own individual project requirements:

- Module rack – with optional integral power supply
- Central processing unit CPU – with optional SafetyBUS p connection
- Digital and analogue input/output modules – for safety-related control functions
- Digital and analogue input/output modules – for standard control functions
- Communication modules for all common fieldbuses and Ethernet

Your benefits at a glance

- One control system for safety-related and standard control functions
- Flexible and adaptable thanks to the modular hardware structure
- Highest performance thanks to fast program processing
- Wide range of application areas thanks to digital and analogue processing
- Open connection to standard fieldbuses, Ethernet and SafetyBUS p
- Modules are simple and quick to install

For decentralised input/output, use one system for safety and standard: PSSuniversal – Read more from page 40.

Safety and control – One system for all control functions, e.g. on cablecars, fairground rides, presses, and many more

Keep up-to-date on PSSmodular systems:

Webcode 0911

Online information at www.pilz.com

Selection guide – PSSmodular systems

Central processing units – PSSmodular controller

PSS1 SB CPU3

PSS 3000 series Type Order number	PSS 3100 series Type Order number
PSS CPU3 ..... 301 064	-
PSS SB CPU3 ..... 301 071	-
PSS SB CPU3 ETH-2 ..... 301 081	-
-	**PSS1 CPU3** 302 064
-	**PSS1 SB CPU3** 302 071
-	**PSS1 SB CPU3 ETH-2** 302 081

Module racks – PSSmodular controller

PSS1 BMPS 3/3

PSS 3000 series Type Order number	PSS 3100 series Type Order number
PSS BM 4 ..... 301 001	-
PSS BMP 4/2 ..... 301 006	-
PSS BM 8 ..... 301 000	-
PSS BMP 8 ..... 301 005	-
-	**PSS1 BMPS 3/3** 302 008
-	**PSS1 BMP 5/2** 302 006

Power supplies – PSSmodular controller

PSS1 PS 24

PSS 3000 series Type Order number	PSS 3100 series Type Order number
PSS PS 301 050	-
PSS PS 24 ..... 301 051	-
-	**PSS1 PS 24** 302 051

Features	Communication SafetyBUS p
▸ Data memory: Failsafe section: 64 KByte, standard section: 170 KByte	-
▸ Program memory: Failsafe section: Integral 512 KByte Flash-EPROM memory, Standard section: Integral 512 KByte Flash-EPROM memory	1
▸ Dimensions (H x W x D): 257 x 41 x 220 mm (PSS 3000), 265 x 41 x 218 mm (PSS 3100)	1
▸ Application range: Failsafe applications to EN 954-1, EN/IEC 61508	-
▸ Interfaces: Combined RS 232/RS 485 interface for programming device, Combined RS 232/RS 485 interface as user interface	1 1

Electrical data	Free slots		Size (H x W x D)
Supply voltage	Number	Use	
-	4	For failsafe modules	277.5 x 280 x 244 mm
-	4	For failsafe modules, 2 can be used for standard modules	277.5 x 280 x 244 mm
-	9	For failsafe modules	277.5 x 482.6 x 244 mm
-	9	For failsafe and standard modules, plug in anywhere	277.5 x 482.6 x 244 mm
24 VDC	3	For failsafe and standard modules, plug in anywhere, integral power supply	266 x 259.4 x 245 mm
-	5	For failsafe modules, 2 can be used for standard modules	266 x 340.6 x 241 mm

Electrical data		
Supply voltage	Power consumption	Continuous current
115/230 VAC, selectable	80 W	10 A
24 VDC	80 W	10 A
24 VDC	50 W	5 A

Technical documentation on PSSmodular systems:

Webcode 0685

Online information at www.pilz.com

Selection guide – PSSmodular systems

Input/output modules for functional safety – PSSmodular I/O

PSS DI2O T

PSS1 DOR

PSS 3000 series Type Order number	PSS 3100 series Type Order number	Inputs Digital	Inputs Analogue -10 V … +10 V
PSS AI 301 121	**PSS1 AI** 302 121	-	6
PSS AI Ip 301 123	**PSS1 AI Ip** 302 123	-	-
PSS DI 2 ..... 301 101	**PSS1 DI 2** 302 101	32	-
PSS DIF 301 105	**PSS1 DIF** 302 105	16	-
PSS DIF 2 ..... 301 106	**PSS1 DIF 2** 302 106	16	-
PSS DI2O T 301 112	**PSS1 DI2O T** 302 112	16	-
PSS DI2O Z 301 109	**PSS DI2O Z** 302 109	16	-
PSS DOS 301 111	**PSS1 DOS** 302 111	-	-
PSS DOR 301 122	**PSS1 DOR** 302 122	-	-

Common features:

- Application range: Failsafe applications to EN 954-1, EN/IEC 61508

Input/output modules for standard applications – PSSmodular I/O

PSS DIO

PSS 3000 series Type Order number	PSS 3100 series Type Order number	Inputs Digital	Inputs Analogue -10 V … +10 V 0 … 20 mA
P10 AIO 304 120	**P9 AIO** 303 120	-	6
P10 DI 304 100	**P9 DI** 303 100	32	-
P10 DIO 304 107	-	16	-
-	**P9 DIO** 303 108	16	-
P10 DO 304 110	-	-	-
-	**P9 DO** 303 111	-	-
P10 DOR 16 ..... 304 122	**P9 DOR 16** 303 122	-	-

Common features:

- Application range: Non-safety-related standard applications

	Outputs			Features
4 … 20 mA	Single-pole	Dual-pole	Relay	
-	-	-	-	Analogue voltage inputs
6	-	-	-	Analogue current inputs
-	-	-	-	Digital inputs to EN 954-1 up to Cat. 4 with test pulses
-	-	-	-	Digital inputs for alarms, input delay 0.5 ms
-	-	-	-	Digital inputs for alarms, input delay 3 ms
-	16	-	-	Digital inputs to EN 954-1 up to Cat. 4 with test pulses; digital 2 A outputs, can also be used as test pulses
-	-	8	-	Digital inputs, dual-pole outputs (2 A)
-	32	-	-	Digital 1.5 A outputs
-	-	-	12	Relay outputs with positive-guided contacts AC1: max. 250 V/0.1 … 4 A/1 000 VA DC1: max. 250 V/0.4 A/100 W, 24 V/4 A/100 W

	Outputs Digital		Analogue	Features
	Semi-conductor	Relay	-10 V … +10 V 0 … 20 mA	
	-	-	2	Analogue current/voltage inputs and outputs
	-	-	-	Digital inputs
	16	-	-	Digital inputs, digital 2 A outputs
	16	-	-	Digital inputs, digital 0.5 A outputs
	32	-	-	Digital 2 A outputs
	32	-	-	Digital 0.5 A outputs
	-	16	-	Relay outputs AC: max. 250 V/2 A/500 VA DC: max. 100 V/0.5 A/50 W

[1] not for input/output modules for standard applications

[1]

[1]

Technical documentation on PSSmodular systems:

Webcode 0685

Online information at www.pilz.com

Selection guide – PSSmodular systems

Communication modules for fieldbus systems and Ethernet – PSSmodular COM

PSS ETH-2

PSS1 DN-S

PSS1 SER

PSS 3000 series Type Order number	PSS 3100 series Type Order number
PSS Ethernet 301 157	**PSS1 Ethernet** 302 157
PSS ETH-2 ..... 301 160	**PSS1 ETH-2** 302 160
PSS DP-S 301 151	**PSS1 DP-S** 302 151
PSS DN-S 301 152	**PSS1 DN-S** 302 152
PSS IBS-S PCP 301 154	**PSS1 IBS-S PCP** 302 154
PSS ControlNet Adapter 301 156	**PSS1 ControlNet-Adapter** 302 156
PSS CANopen 301 155	**PSS1 CANopen** 302 155
PSS SER 301 159	**PSS1 SER** 302 159

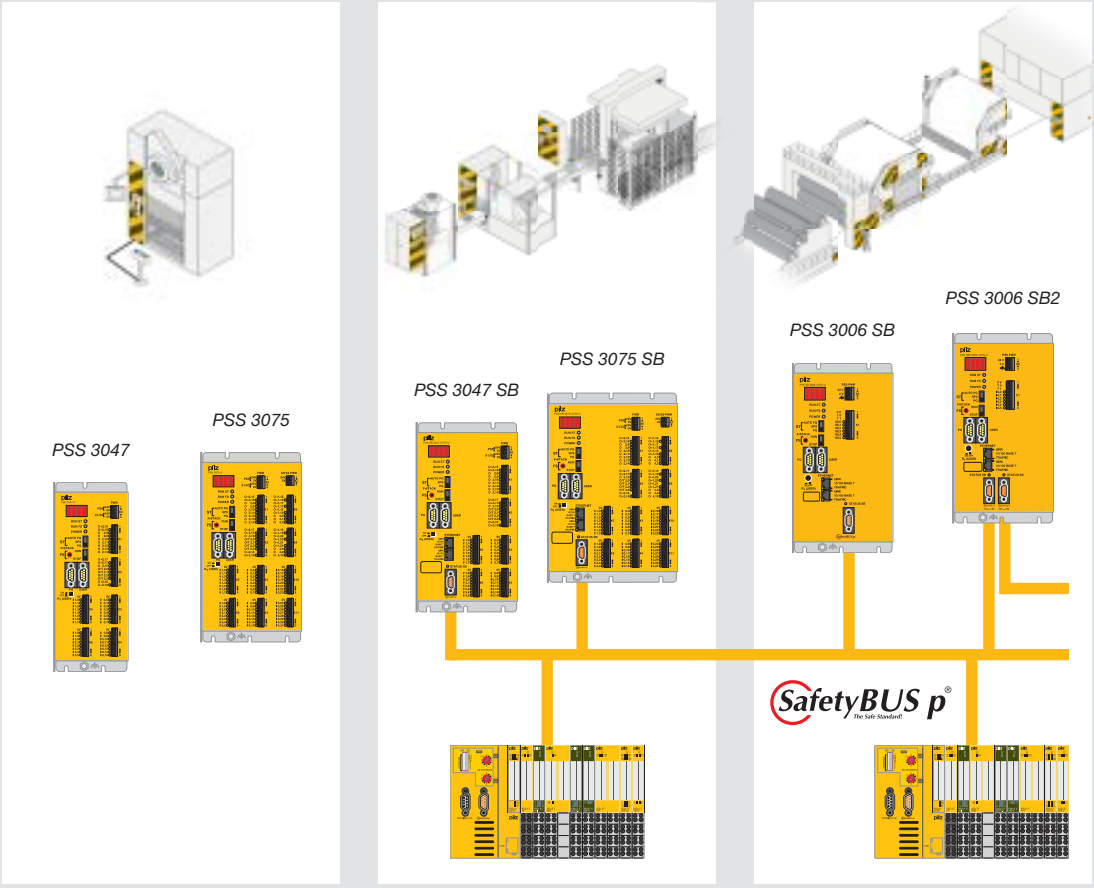
Function	Features
Ethernet	▸ Ethernet interfaces: Twisted Pair (RJ45)/AUI (IEEE 802.3) ▸ IP address: Selectable via configuration software or DHCP ▸ Transmission rate: 10 MBit/s
Ethernet	▸ Ethernet interfaces: Twisted Pair (RJ45)/4 Ports ▸ IP address: Selectable via configuration software or DHCP ▸ Transmission rate: 10/100 MBit/s
PROFIBUS-DP	▸ Device type: Slave ▸ Transmission rate: 9.6/19.2/93.75/187.5/500 kBit/s, 1.5/3/6/12 MBit/s ▸ Data length: max. 488 Bytes
DeviceNet	▸ Device type: Slave ▸ Transmission rate: 125/250/500 kBit/s, selectable via rotary switch ▸ Data length: 0 … 32 words, selectable
INTERBUS	▸ Device type: Slave with PCP channel ▸ Transmission rate: 500 kBit/s or 2 MBit/s, selectable ▸ Data length: 0 … 32 words, selectable (incl. PCP) ▸ PCP channel: 0, 1, 2 or 4 words, selectable
ControlNet	▸ Device type: Adapter ▸ ControlNet interface in accordance with ControlNet International ▸ Transmission rate: 5 MBit/s ▸ Data length: scheduled messages 0 … 128 words, unscheduled messages 32 words
CANopen	▸ Device type: Slave ▸ CANopen interface in accordance with CiA DS 301 V3.0 and CiA DS 102 V2.0 ▸ Transmission rate: 6/10/12.5/20/33/50/66/100/125/333/500/666/1 000 kBit/s ▸ Data length: max. 512 Words
Serial interface	▸ COM1/COM2: RS 232/RS 485 (combined) ▸ Transmission rate: 150/300/600/1 200/2 400/4 800/9 600/19 200/38 400/57 600/76 800/115 200 Bit/s ▸ Data length: 1 024 Words

Technical documentation on PSSmodular systems:

Webcode 0685

Online information at www.pilz.com

PSScompact systems



Choose the control solution that's right for you from our comprehensive portfolio.

Numerous application options

Different projects require different control solutions. PSScompact systems are versatile, so you always have the right solution – whether on stand-alone machines or extended plants.

Centralised control of stand-alone machines

With a constant number of sensors and actuators, the PSScompact is the right solution:

- PSS 3047 – Centralised system with 47 failsafe inputs and outputs
- PSS 3075 – Centralised system with 75 failsafe inputs and outputs

Application examples:
Machining centres, presses

Centralised control with optional decentralised expansion via SafetyBUS p

Reduced wiring on large stand-alone machines, so flexible when it comes to subsequent changes and expansions:

- PSS 3047 SB – Centralised system with 47 failsafe inputs and outputs and decentralised expansion options via SafetyBUS p
- PSS 3075 SB – Centralised system with 75 failsafe inputs and outputs and decentralised expansion options via SafetyBUS p

Centrally driven stand-alone machines can be interconnected via SafetyBUS p in order to exchange safety-related information.

Application examples:
Press brakes, mechanical and hydraulic presses, cable cars

Decentralised control of extended plants via SafetyBUS p

Create the optimum structure for plant lines extending over a large physical area and/or connect independent machine units to form interlinked plants:

- PSS 3006 SB – Decentralised system with up to 4,032 failsafe inputs and outputs via SafetyBUS p

Application examples: Large presses, packaging machines

Double the network extension with SafetyBUS p

Network distributed plants with network extensions of up to 7,000 metres through a second SafetyBUS p interface:

- PSS 3006 SB2 – For up to 8,064 decentralised failsafe inputs and outputs via SafetyBUS p

Up to 126 bus subscribers can be connected without problem.

Application examples:
Cablecar technology, press lines, paint lines

Your benefits at a glance

- One control system for safety-related and standard control functions
- Open connection to standard fieldbuses, Ethernet and SafetyBUS p
- Comprehensive product portfolio for a wide range of applications
- Rapid processing of time-critical cycles and short reaction times due to alarm processing

Rugged and safe

With the rugged version of the PSScompact systems PSS 3047-3 AI Ip-R you can comply with all the requirements for vibration and shock. Even with sinusoidal continuous duty with sliding frequency in all three spatial directions, vibration resistance is guaranteed. Shock resistance is also guaranteed with up to 1,000 half sine shocks.

For decentralised input/output, use one system for safety and standard: PSSuniversal – Read more from page 40.

Keep up-to-date on PSScompact systems:

Webcode 0914

Online information at www.pilz.com

Selection guide – PSScompact systems

Centralised safety system with 47 inputs/outputs – PSS 3047

PSS 3047-3

Type	Inputs Digital (6 are alarm outputs)	Inputs Analogue		Outputs
		-10 V ... +10 V	0 ... 25.5 mA	Single-pole (4 are test pulse outputs)
PSS 3047-3	32	-	-	12
PSS 3047-3 DP-S	32	-	-	12
PSS 3047-3 ETH-2	32	-	-	12
PSS 3047-3 CANopen	32	-	-	12
PSS 3047-3 AI	32	6	-	12
PSS 3047-3 AI Ip	32	-	6	12
PSS 3047-3 AI Ip-R	32	-	6	12

Centralised safety system with 47 inputs/outputs and decentralised expansion options via SafetyBUS p – PSS

PSS SB 3047-3 ETH-2

Type	Inputs Digital (6 are alarm outputs)	Inputs Analogue		Outputs
		-10 V ... +10 V	0 ... 25.5 mA	Single-pole (4 are test pulse outputs)
PSS SB 3047-3 ETH-2	32	-	-	12
PSS SB 3047-3 DP-S	32	-	-	12
PSS SB 3047-3 AI ETH-2	32	6	-	12
PSS SB 3047-3 AI Ip ETH-2	32	-	6	12

Common features:

- Supply voltage: 24 VDC
- Data memory: Failsafe section: 64 kByte, standard section: 170 KByte
- Program memory: Failsafe section: Integral 512 kByte Flash-EPROM memory, standard section: Integral 512 kByte Flash-EPROM memory
- Dimensions (H x W x D): 246.4 x see table x 162 mm
- Application range: Failsafe applications to EN 954-1, EN/IEC 61508
- Interfaces: Combined RS 232/RS 485 interface for programming device, combined RS 232/RS 485 interface as user interface

Dual-pole	Communication: SafetyBUS p	Communication: PROFIBUS-DP	Communication: CANopen	Communication: Ethernet	Size: Width	Order number	Accessories, connector sets: Screw terminals	Accessories, connector sets: Spring-loaded terminals
3					87.0 mm	300100	PSS ZKL 3047-3 Order number: 300900	PSS ZKF 3047-3 Order number: 300904
3		◆			123.6 mm	300105		
3				◆	123.6 mm	300120		
3			◆		123.6 mm	300130		
3					123.6 mm	300110	PSS ZKL 3047-3 AI Order number: 300902	PSS ZKF 3047-3 AI Order number: 300906
3					123.6 mm	300115		
3					138.6 mm	300215		

3047 SB

Dual-pole	Communication: SafetyBUS p	Communication: PROFIBUS-DP	Communication: CANopen	Communication: Ethernet	Size: Width	Order number	Accessories, connector sets: Screw terminals	Accessories, connector sets: Spring-loaded terminals
3	◆			◆	123.6 mm	300150	PSS ZKL 3047-3 Order number: 300900	PSS ZKF 3047-3 Order number: 300904
3	◆	◆			160.2 mm	300160		
3	◆			◆	160.2 mm	300170	PSS ZKL 3047-3 AI Order number: 300902	PSS ZKF 3047-3 AI Order number: 300906
3	◆			◆	160.2 mm	300180		

SafetyBUS p

CANopen

Ethernet

Technical documentation on PSScompact systems:

Webcode 0685

Online information at www.pilz.com

Selection guide – PSScompact systems

Centralised safety system with 75 inputs/outputs – PSS 3075

PSS 3075-3

Type	Inputs Digital (6 are alarm outputs)	Inputs Analogue		Outputs
		-10 V ... +10 V	0 ... 25.5 mA	Single-pole (4 are test pulse outputs)
PSS 3075-3	48	-	-	18
PSS 3075-3 DP-S	48	-	-	18

Centralised safety system with 75 inputs/outputs and decentralised expansion options via SafetyBUS p – PSS

PSS SB 3075-3 ETH-2

Type	Inputs Digital (6 are alarm outputs)	Inputs Analogue		Outputs
		-10 V ... +10 V	0 ... 25.5 mA	Single-pole (4 are test pulse outputs)
PSS SB 3075-3 CANopen	48	-	-	18
PSS SB 3075-3	48	-	-	18
PSS SB 3075-3 ETH-2	48	-	-	18
PSS SB 3075-3 DP-S	48	-	-	18

Common features:

- Supply voltage: 24 VDC
- Data memory: Failsafe section: 64 kByte, standard section: 170 KByte
- Program memory: Failsafe section: Integral 512 kByte Flash-EPROM memory, standard section: Integral 512 kByte Flash-EPROM memory
- Dimensions (H x W x D): 246.4 x see table x 162 mm
- Application range: Failsafe applications to EN 954-1, EN/IEC 61508
- Interfaces: Combined RS 232/RS 485 interface for programming device, combined RS 232/RS 485 interface as user interface

Dual-pole	Communication				Size	Order number	Accessories, connector sets	
	SafetyBUS p	PROFIBUS-DP	CANopen	Ethernet	Width		Screw terminals	Spring-loaded terminals
9					123.6 mm	300200	PSS ZKL 3075-3 Order number: 300910	PSS ZKF 3075-3 Order number: 300912
9		◆			160.2 mm	300205		

3075 SB

Dual-pole	Communication				Size	Order number	Accessories, connector sets	
	SafetyBUS p	PROFIBUS-DP	CANopen	Ethernet	Width		Screw terminals	Spring-loaded terminals
9	◆		◆		196.8 mm	300230	PSS ZKL 3075-3 Order number: 300910	PSS ZKF 3075-3 Order number: 300912
9	◆				160.2 mm	300240		
9	◆			◆	160.2 mm	300250		
9	◆	◆			196.8 mm	300255		

SafetyBUS p

CANopen

Ethernet

Technical documentation on PSScompact systems:

Webcode 0685

Online information at www.pilz.com

Selection guide – PSScompact systems

Decentralised safety system with up to 4,032 inputs/outputs via SafetyBUS p – PSS 3006 SB

Common features:

- Supply voltage: 24 VDC
- Data memory:
  Failsafe section: 64 kByte,
  standard section: 170 KByte
- Program memory:
  Failsafe section: Integral 512 kByte
  Flash-EPROM memory,
  standard section: Integral 512 kByte
  Flash-EPROM memory
- Dimensions (H x W x D):
  246 x 123 x 161 mm
- Application range:
  Failsafe applications to
  EN 954-1, EN/IEC 61508
- Interfaces: Combined
  RS 232/RS 485 interface for
  programming device, combined
  RS 232/RS 485 interface as
  user interface

PSS SB 3006-3 ETH-2

Type	Inputs Digital
PSS SB 3006-3 ETH	6
PSS SB 3006-3 ETH-2	6
PSS SB 3006-3 DP-S	6
PSS SB 3006-3 IBS-S	6
PSS SB 3006-3 DN-S	6
PSS SB 3006-3 CN-A	6
PSS SB 3006-3 ETH DP-S	6
PSS SB 3006-3 ETH IBS-S	6
PSS SB 3006-3 ETH-2 IBS-S	6
PSS SB 3006-3 ETH-2 DP-S	6

Decentralised safety system with up to 8,064 inputs/outputs via SafetyBUS p – PSS 3006 SB2

Common features:

- Supply voltage: 24 VDC
- Data memory:
  Failsafe section: 64 kByte,
  standard section: 170 KByte
- Program memory:
  Failsafe section: Integral 512 kByte
  Flash-EPROM memory,
  standard section: Integral 512 kByte
  Flash-EPROM memory
- Dimensions (H x W x D):
  246 x 123 x 161 mm
- Application range:
  Failsafe applications to
  EN 954-1, EN/IEC 61508
- Interfaces: Combined
  RS 232/RS 485 interface for
  programming device, combined
  RS 232/RS 485 interface as
  user interface

PSS SB2 3006-3 ETH-2

Type	Inputs Digital
PSS SB2 3006-3 DP-S	6
PSS SB2 3006-3 IBS-S	6
PSS SB2 3006-3 DN-S	6
PSS SB2 3006-3 CN-A	6
PSS SB2 3006-3 ETH-2	6
PSS SB2 3006-3 ETH-2 DP-S	6
PSS SB2 3006-3 ETH-2 IBS-S	6

Outputs	Communication						Order number	Accessories, connector sets	
Test pulses	SafetyBUS p	PROFIBUS-DP	INTERBUS	ControlNet	DeviceNet	Ethernet		Screw terminals	Spring-loaded terminals
2	◆					◆	301 630	PSS ZKL 3006-3 Order number: 300 914	PSS ZKF 3006-3 Order number: 300 916
2	◆					◆	301 780		
2	◆	◆					301 600		
2	◆		◆				301 610		
2	◆				◆		301 750		
2	◆			◆			301 620		
2	◆	◆				◆	301 650		
2	◆		◆			◆	301 660		
2	◆		◆			◆	301 800		
2	◆	◆				◆	301 790		

Outputs	Communication						Order number	Accessories, connector sets	
Test pulses	SafetyBUS p	PROFIBUS-DP	INTERBUS	ControlNet	DeviceNet	Ethernet		Screw terminals	Spring-loaded terminals
2	◆ (2 x)	◆					301 680	PSS ZKL 3006-3 Order number: 300 914	PSS ZKF 3006-3 Order number: 300 916
2	◆ (2 x)		◆				301 690		
2	◆ (2 x)				◆		301 770		
2	◆ (2 x)			◆			301 700		
2	◆ (2 x)					◆	301 640		
2	◆ (2 x)	◆				◆	301 710		
2	◆ (2 x)		◆			◆	301 720		

SafetyBUS p

DeviceNet

Ethernet

Technical documentation on PSScompact systems:

Webcode 0685

Online information at www.pilz.com

Decentralised periphery and network com

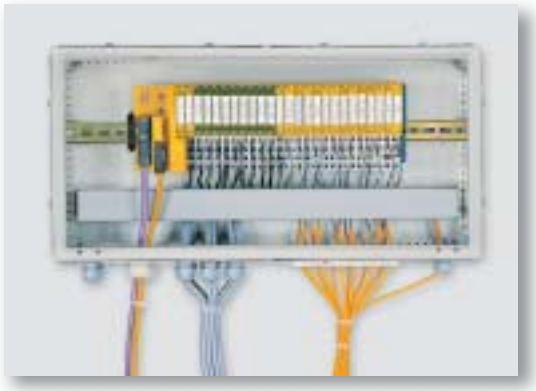
Input/output on interlinked plants extending over a wide area

Are you looking for a convincing solution at field level? Then Pilz's decentralised components are an advised choice – whether you are looking for a complete system for the I/O periphery or an IP67 input module.

PSSuniversal – One system for the whole I/O periphery

With the decentralised I/O system PSSuniversal, safety-related and/or standard control functions are performed decentrally at field level. Communication at control level is via common fieldbus systems and/or the safe, open bus system SafetyBUS p.

All sensor and actuator signals are connected to one module. So clear cabling is assured and errors during installation can be avoided.



Temperature-resistant modules

Rugged environments demand components that will operate reliably where there are high temperature fluctuations. Special PSSuniversal modules, which are identified by a T in the type description, can be used in places where cabinet heating would be very costly or uneconomical, or where heat is a key factor. In a temperature range of -30 °C to +60 °C they can easily withstand moisture and condensation within the scope of pollution degree 2.

ponents

PSS67 – Resistant to dirt and water in accordance with IP67.

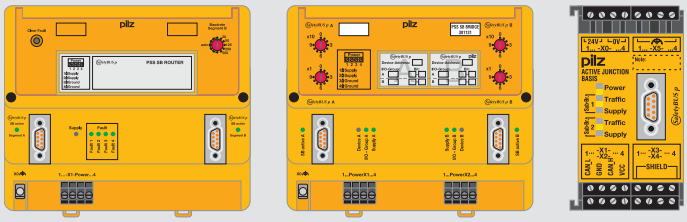
PSS67 – Input module for cabinet-free installation

The digital input module PSS67 monitors safety functions decentrally in the field. Both the module and the M12 connections offer IP67 protection. Simple screw assembly minimises your planning, design and installation work. Direct on-site installation also saves you space in the control cabinet. Thanks to the extended temperature range of -40 °C to +60 °C, you can now be flexible in your applications.

Network components – For a clear, powerful network

Network components make extended plants with distributed control logic more powerful. Network components enable:

- The bus architectures to be clearly structured
- The networks to be divided into individual bus segments
- Several networks to be linked together



Router *Bridge* *Active Junction*

Components for SafetyBUS p networks:

- Router – Logical division of your bus structure, particularly when the individual bus subscribers are physically separated over a long distance.
- Bridge – The link to rapid data transfer, to an increase in the number of bus subscribers and to the network's maximum overall length.
- Active Junction – Modular, flexible isolation of sub branches

Keep up-to-date on:

- *Decentralised periphery*

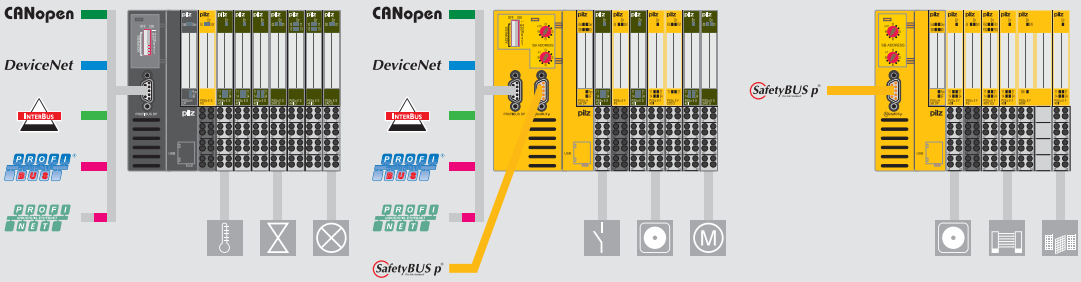
Webcode 0930

- *Network components*

Webcode 0934

Online information at www.pilz.com

Decentralised I/O system PSSuniversal



Modular system structure

Assemble the input and output modules on the decentralised I/O system individually in accordance with your requirements and adapt the system structure of the PSSuniversal modules to meet your exact needs. When adjustments are made to the system at a later date, simply add new modules or exchange existing ones.

1 Head module

Connects the sensor/actuator level to master control systems via SafetyBUS p for safety-related functions and/or standard fieldbus systems for standard control functions.

2 Input/output modules

For safety-related or non-safety-related digital or analogue signal processing. Up to 64 input/output modules can be installed in any order.

3 Supply voltage module

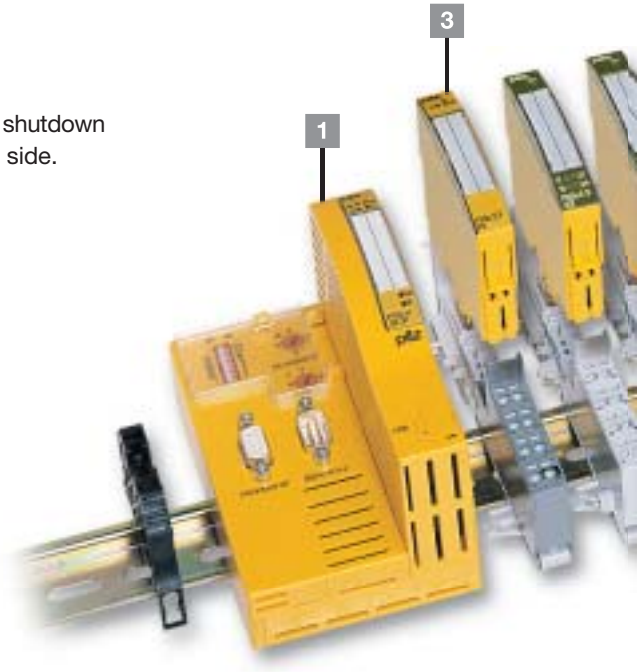
For the internal supply voltage and the formation of different supply groups.

4 Safe block switching module

For the formation of safe shutdown groups on the hardware side.

5 Base modules

Carrier units for the input/output modules, the supply voltage modules and the block switching module. These are simply inserted on to the base modules and are easy to change when adjustments are made to the system.



1. The head module is attached to the top hat rail.

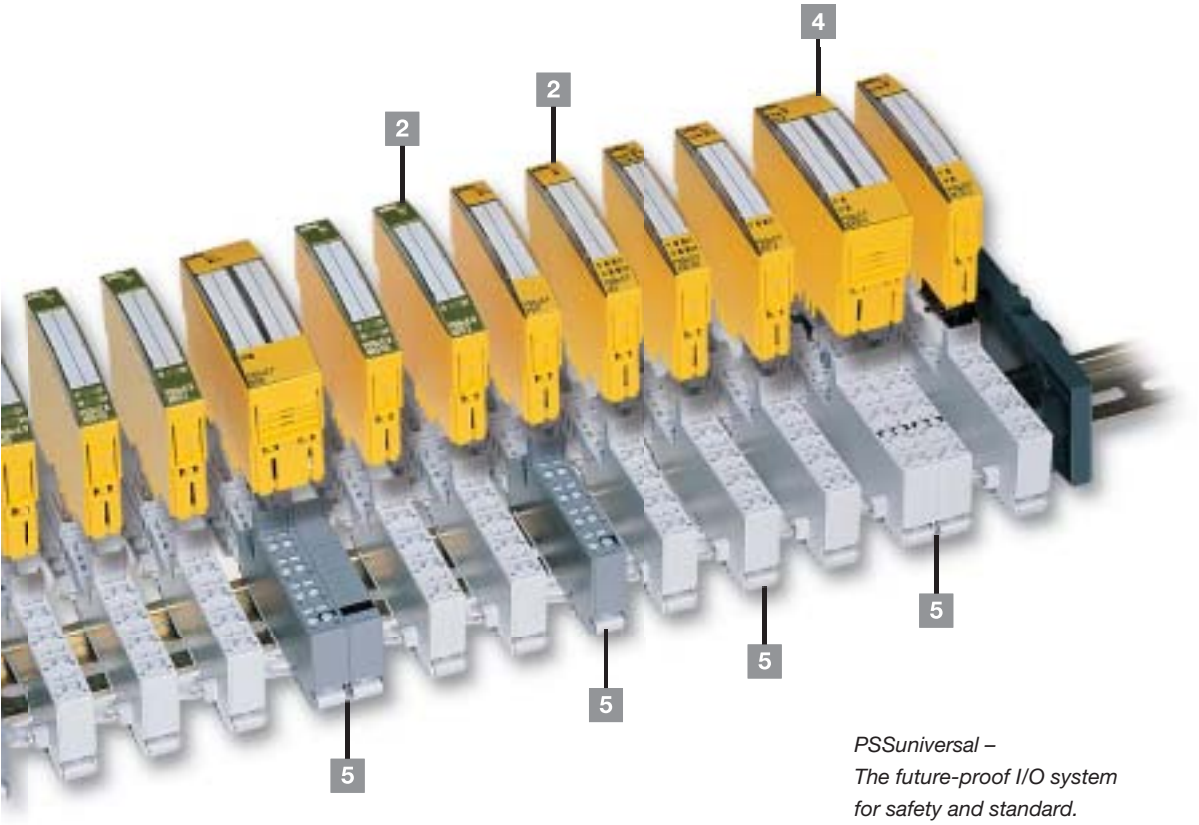
2. The relevant base modules are attached to the top hat rail.

3. The modules are attached and connected.

4. The terminating plate is attached with an end bracket.

5. With just one click: the relevant electronic modules are connected.

6. The modules are labelled.



PSSuniversal –
The future-proof I/O system for safety and standard.

Module selection made simple – with the PSSuniversal Assistant:

Webcode 1250

Online information at www.pilz.com

PSSuniversal – The future-proof I/O solution

Intelligent dovetailing of standard and safety

On the decentralised I/O system PSSuniversal, safety-related and standard control functions are mixed in physical terms, but separate in terms of logic. The requirements for extremely short reaction times and absence of feedback can therefore be met. The system is designed completely in accordance with Category 4 of EN 954-1 and SIL CL 3 of IEC 61508.

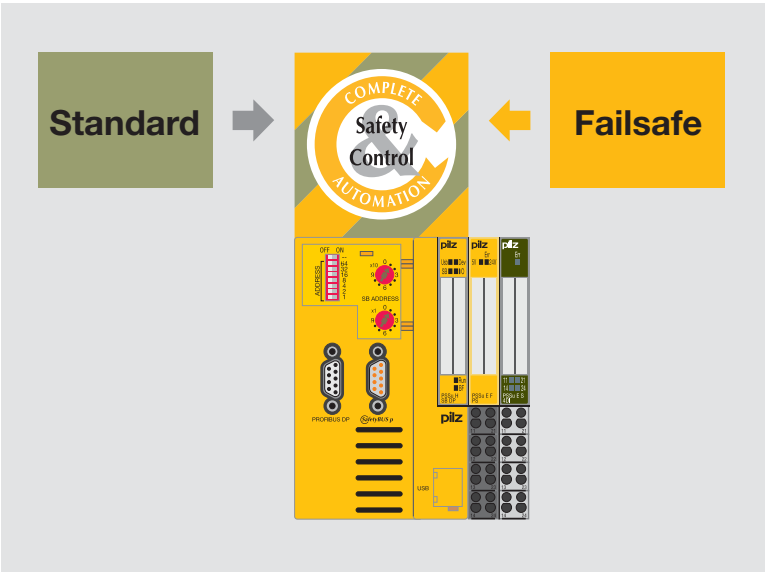
Sheer diversity

The PSSuniversal has various head modules, so you can operate flexibly to suit your requirements. The failsafe head modules are equipped with interfaces to common communication networks such as CANopen, DeviceNet, PROFIBUS, PROFINET, INTERBUS and SafetyBUS p; the standard head modules can communicate with CANopen, DeviceNet, PROFIBUS, PROFINET and INTERBUS. This means you can retain your existing system architectures.

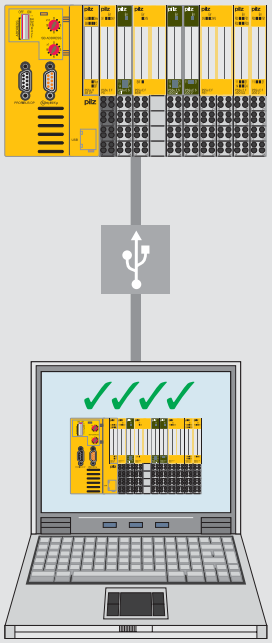
Local enable principle reduces response times

The local enable principle on the PSSuniversal compares the incoming switch signals from the process controller at field level with the safe enable information on the PSS system. It then enables the signals when safe operation of the plant is guaranteed.

By shifting the enable principle to field level, reduced demands are placed on the system in terms of CPU cycle time and bus transmission time. Comparative measurements have shown that this can reduce actual response times by more than 60 %.



The local enable principle guarantees the safe operations of your plant.



Rapid commissioning

The PSSuniversal Startup Software can be used to carry out initial cable and function tests before the plant or machine is assembled. That way all of the periphery is tested and functional when you come to commission the control software. So commissioning work can be carried out independently and in parallel, reducing dependencies and saving time.

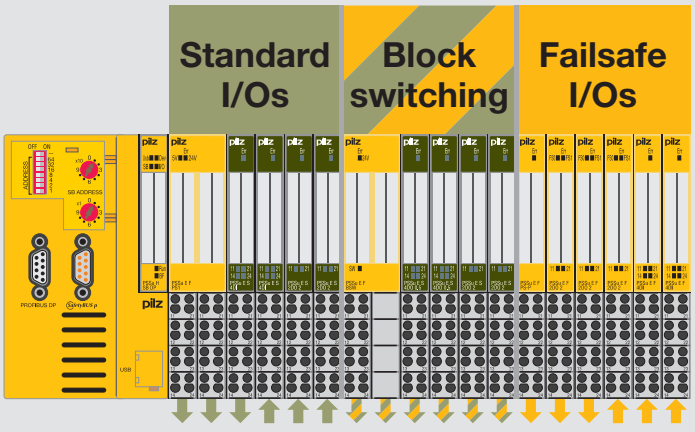
Cable and function tests are simply run through the USB port on the notebook.

Your benefits at a glance

- Input/output of safety-related and standard control signals
- Modular system structure for flexible applications
- Extensive selection of modules to meet your requirements
- Digital and analogue processing
- Response times reduced by over 60 % thanks to the local enable principle
- Optimum availability thanks to safe block switching
- Rapid installation, rapid module exchange
- Rapid commissioning due to the independent periphery test

Safe block switching of individual plant sections

Block switching is used to shut down the supply voltage to a group of standard outputs (e.g. several motors) when a hazardous event occurs. So when a hazardous event does occur – e.g. an emergency stop pushbutton is operated – the safe shutdown of a complete plant section is guaranteed, while other sections can continue to operate.



When a fault occurs, safe block switching guarantees that a particular plant section is shut down safely, while other sections can continue to operate.

Keep up-to-date on decentralised periphery:

Webcode 0930

Online information at www.pilz.com

Selection guide – Decentralised I/O system

Head modules for functional safety and standard control functions – PSSuniversal COM

PSSu H SB DP

PSSu H DP

Type	Application area		Communications interfaces		
	Failsafe functions	Standard functions	SafetyBUS p	CANopen	DeviceNet
PSSu H SB	◆		◆		
PSSu H SB DP	◆	◆	◆		
PSSu H SB DN	◆	◆	◆		◆
PSSu H SB CAN	◆	◆	◆		◆
PSSu H CAN		◆		◆	
PSSu H DP		◆			
PSSu H DN		◆			◆
PSSu H SB IBSe	◆	◆	◆		
PSSu H SB IBSo	◆	◆	◆		
PSSu H IBSe		◆			
PSSu H IBSo		◆			
PSSu H F PN	◆	◆			
PSSu H S PN		◆			

Head modules for the automation system PSS 4000

Part of PSS 4000

PSSu H F PLC1 FS SN SD

Type	Application area		Communications interfaces		
	Failsafe functions	Standard functions	SafetyNET p	PROFIBUS-DP	Ethernet
PSSu H PLC1 FS SN SD	◆	◆	◆		
PSSu H PLC1 FS DP SN SD	◆	◆	◆	◆	
PSSu H m F DP SN SD	◆	◆	◆	◆	
PSSu H m F DP ETH SD	◆	◆ [2)]	◆		◆
PSSu H FS SN SD	◆	◆ [2)]	◆		
PSSu H FS SN RF	◆	◆	◆		

Common features:

- Integrated power supply
- Integrated switch function for linear topology

PSSuniversal

PROFIBUS-DP	INTERBUS	PROFINET	Size H x W x D	Order number Regular version	Coated version
			128.4 x 50.2 x 72.6 mm	312010	314010
◆			128.4 x 75.2 x 79.4 mm	312025	314025
			128.4 x 75.2 x 79.4 mm	312030	314030
			128.4 x 75.2 x 79.4 mm	312035	314035
			128.4 x 75.2 x 79.4 mm	312047	314047
◆			128.4 x 75.2 x 79.4 mm	312045	314045
			128.4 x 75.2 x 79.4 mm	312046	314046
	◆		128.4 x 75.2 x 79.4 mm	312015	-
	◆		128.4 x 75.2 x 79.4 mm	312020	-
	◆		128.4 x 75.2 x 79.4 mm	312048	-
	◆		128.4 x 75.2 x 79.4 mm	312049	-
		◆	128.4 x 75.2 x 79.4 mm	312040 (312043) [1]	-
		◆	128.4 x 75.2 x 79.4 mm	312041	-

[1] *Half-byte version*

Programming	Size H x W x D	Order number Regular version	Coated version
▸ IEC 61131-3 programming languages ▸ PASmulti programming language ▸ Ethernet TCP/IP	125.6 x 130 x 83.7 mm	312070	-
▸ IEC 61131-3 programming languages ▸ PASmulti programming language ▸ Ethernet TCP/IP	125.6 x 130 x 83.7 mm	312071	-
PASmulti programming language	125.6 x 130 x 83.7 mm	312065	-
PASmulti programming language	125.6 x 130 x 83.7 mm	312060	-
-	125.6 x 130 x 83.7 mm	312085	-
-	125.6 x 130 x 83.7 mm	312080	314080

[2] *Standard I/O functions, 1 failsafe control task*

Technical documentation on the decentralised periphery:

Webcode 0685

Online information at www.pilz.com

Selection guide – Decentralised I/O system

Supply modules, junction modules and safe block switching module – PSSuniversal I/O

PSSu E F PS

PSSu E PD

Type	Function	Application area		Electrical data	
		Failsafe functions	Standard functions	Supply voltage	Current load capacity Module supply
PSSu E F PS	Power supply	◆	◆	24 VDC	max. 1.5 A
PSSu E F PS1	Power supply, buffered	◆	◆	24 VDC	max. 2.0 A
PSSu E F PS-P	Power supply, periphery	◆	◆	24 VDC	-
PSSu E PD	Voltage distribution		◆	-	-
PSSu E PD1	Voltage distribution		◆	-	-
PSSu S PD-D	Voltage distribution		◆	-	-
PSSu E F BSW	Block switching function	◆	◆	24 VDC	-
PSSu E PS-P 5 V	Voltage distribution		◆	24 VDC	-
PSSu E PS-P +/- 10 V	Voltage distribution		◆	24 VDC	-
PSSu E PS-P +/- 15 V	Voltage distribution		◆	24 VDC	-

PSSuniversal

Current load capacity Periphery supply	Order number	Screw terminals [1]												Cage clamp terminals [1]										
	Order number	312600	312610	312618	312618	312622	312628	312630	312650	312652	312654	312656		312601	312611	312619	312619	312623	312629	312631	312651	312653	312655	312657
	Suitable base module	PSSu BP 1/8 S [2]	PSSu BP-C 1/8 S [3]	PSSu BP 1/12 S	PSSu BP-C1 1/12 S	PSSu BP-C 1/12 S	PSSu BP 2/16 S	PSSu BP-C 2/16 S	PSSu BS 1/8 S	PSSu BS-R 1/8 S	PSSu BS-R 2/8 S	PSSu BS 2/8 S		PSSu BP 1/8 C [2]	PSSu BP-C 1/8 C [3]	PSSu BP 1/12 C	PSSu BP-C 1/12 C	PSSu BP-C1 1/12 C	PSSu BP 2/16 C	PSSu BP-C 2/16 C	PSSu BS 1/8 C	PSSu BS-R 1/8 C	PSSu BS-R 2/8 C	PSSu BS 2/8 C
max. 10 A	312190 [1]								◆	◆											◆	◆		
max. 10 A	312191 [1]										◆	◆											◆	◆
max. 10 A	312185 [1]								◆												◆			
-	312195 [1]	◆	◆	◆	◆									◆	◆	◆	◆							
-	312196 [1]						◆	◆											◆	◆				
-	312197	◆	◆	◆		◆								◆	◆	◆		◆						
max. 8 A	312230 [1]											◆												◆
-	312590	◆		◆	◆									◆		◆	◆							
-	312591	◆		◆	◆									◆		◆	◆							
-	312592	◆		◆	◆									◆		◆	◆							

[1] A coated version of the modules is also available for use where there are increased environmental requirements on temperature and humidity. The order numbers for the coated version of the modules are 314… rather than 312…

[2] without C-rail [3] with C-rail

SafetyBUS p

CANopen

DeviceNet

PROFIBUS

Technical documentation on the decentralised periphery:

Webcode 0685

Online information at www.pilz.com

Selection guide – Decentralised I/O system

Digital inputs and outputs

PSSu E F 4DI

PSSu E F 2DOR 8

PSSu E S 4DI

Type	Function	Application area: Failsafe functions	Application area: Standard functions
PSSu E F 4DI	4 digital inputs	◆	
PSSu E F 4DO 0.5	4 digital outputs	◆	
PSSu E F 2DO 2	2 digital outputs	◆	
PSSu E F DI OZ 2	1 digital input, 1 digital outputs	◆	
PSSu E F 2DOR 8	2 relay outputs	◆	
PSSu E S 4DI	4 digital inputs		◆
PSSu E S 4DO 0.5	4 digital outputs		◆
PSSu E S 2DO 2	2 digital outputs		◆
PSSu E S 2DOR 10	2 relay outputs		◆
PSSu E S 2DOR 2	2 relay outputs		◆
PSSu K S 8DI 8DO 0.5	8 digital outputs, 8 digital inputs		◆
PSSu K S 16DI	16 digital inputs		◆
PSSu K S 16DO 0.5	16 digital outputs		◆

Common features:

- Supply voltage from module supply: 5 VDC
- Separation of supply

PSSuniversal

Electrical data	Order number		Screw terminals [1]							Cage clamp terminals [1]						
Feature Inputs Outputs	Regular version [1]	Diagnostic modules (-D)	Suitable base module Order number	PSSu BP 1/8 S [2] 312600	PSSu BP-C 1/8 S [3] 312610	PSSu BP 1/12 S.....312618	PSSu BP-C 1/12 S....312620	PSSu BP-C1 1/12 S...312622	PSSu BP 2/16 S.....312628	PSSu BP-C 2/16 S....312630	PSSu BP 1/8 C [2] 312601	PSSu BP-C 1/8 C [3]....312611	PSSu BP 1/12 C 312619	PSSu BP-C 1/12 C 312621	PSSu BP-C1 1/12 C...312623	PSSu BP 2/16 C 312629	PSSu BP-C 2/16 C 312631
-	312200			◆		◆		◆			◆		◆		◆		
0.5 A	312210			◆	◆	◆		◆			◆	◆	◆		◆		
2 A	312215			◆	◆	◆		◆			◆	◆	◆		◆		
1 (2 A), dual-pole 1 test pulse output	312220			◆	◆	◆		◆			◆	◆	◆		◆		
2 N/O AC1: 250 V/8 A; 2000 V DC1: 24 V/8 A	312225								◆	◆						◆	◆
-	312400	312401		◆	◆	◆		◆			◆	◆	◆		◆		
0.5 A	312405	312406 [1]		◆	◆	◆		◆			◆	◆	◆		◆		
2 A	312410	312411 [1]		◆	◆	◆		◆			◆	◆	◆		◆		
2 N/O	312510								◆	◆						◆	◆
2 N/O	312511			◆	◆	◆		◆			◆	◆	◆		◆		
0.5 A	312431																
-	312430																
0.5 A	312432																

[1] A coated version of the modules is also available for use where there are increased environmental requirements on temperature and humidity. The order numbers for the coated version of the modules are 314… rather than 312… Exception: PSSu K S 8DI 8DO 0.5; PSSu K S 16DI; PSSu K S 16DO 0.5

[2] without C-rail [3] with C-rail

★ *Type recommended by Pilz for the majority of your applications*

Technical documentation on the decentralised periphery:

Webcode 0685

Online information at www.pilz.com

Selection guide – Decentralised I/O system

Analogue inputs and outputs

PSSu E F AI I

PSSu E S 2AI U

Type	Function	Application area: Failsafe functions	Application area: Standard functions
PSSu E F AI I [4]	Analogue input, passive	◆	
PSSu E F AI U [4]	Analogue input	◆	
PSSu E S 2AI U	2 analogue inputs		◆
PSSu E S 4AI U	4 analogue inputs		◆
PSSu E S 2AI I se	2 analogue inputs		◆
PSSu E S 2AO U	2 analogue outputs		◆
PSSu E S 4AO U	4 analogue outputs		◆
PSSu E S 2AO I	2 analogue outputs		◆
PSSu E S 2AI RTD	2 analogue inputs		◆
PSSu E S 2AI TC	2 analogue inputs		◆

Counter modules

PSSu E F INC

PSSu E F ABS SSI [4]	Absolute encoder SSI	◆	
PSSu E F INC [4]	Incremental encoder	◆	
PSSu E S ABS SSI	Absolute encoder SSI		◆
PSSu E S INC	Incremental encoder		◆
PSSu E S INC 24 se	Incremental encoder		◆

Electronic module with serial interface

PSSu E S RS232

PSSu E S RS232	RS232 interface		◆
PSSu E S RS485	RS 485 interface		◆

PSSuniversal

Electrical data Feature Inputs Outputs	Order number [1]	Screw terminals [1]									Cage clamp terminals [1]								
		Order number Suitable base module	PSSu BP 1/8 S [2] 312600	PSSu BP-C 1/8 S [3] 312610	PSSu BP 1/8 S-J 312602	PSSu BP-C 1/8 S-J...312612	PSSu BP 1/12 S.....312618	PSSu BP-C 1/12 S....312620	PSSu BP-C1 1/12 S...312622	PSSu BP 2/16 S.....312628	PSSu BP-C 2/16 S....312630	PSSu BP 1/8 C [2] 312611	PSSu BP-C 1/8 C [3] 312612	PSSu BP 1/8 C-J.....312603	PSSu BP-C 1/8 C-J...312613	PSSu BP 1/12 C 312619	PSSu BP-C 1/12 C ..312621	PSSu BP-C1 1/12 C ..312623	PSSu BP 2/16 C 312629	PSSu BP-C 2/16 C 312631
0 … 25 mA	312260		◆	◆			◆	◆				◆	◆			◆	◆			
-10 … +10 V	312265		◆	◆			◆	◆				◆	◆			◆	◆			
0 … 10 V s.e.; diff; -10 … +10 V	312440		◆	◆								◆	◆							
0 … 10 V s.e.	312445		◆	◆			◆	◆				◆	◆			◆	◆			
0 … 20 mA; 4 … 20 mA	312450		◆	◆								◆	◆							
0 … 10 V; -10 … +10 V	312460		◆	◆								◆	◆							
0 … 10 V	312465		◆	◆			◆	◆				◆	◆			◆	◆			
0 … 20 mA; 4 … 20 mA	312470		◆	◆								◆	◆							
-	312490						◆	◆								◆	◆			
Thermocouples	312500				◆	◆								◆	◆					
SSI	312275		◆	◆			◆	◆				◆	◆			◆	◆			
INC	312280									◆	◆								◆	◆
SSI	312480		◆	◆								◆								
INC	312485									◆	◆								◆	◆
INC	312486									◆	◆								◆	◆
-	312515		◆	◆			◆	◆				◆	◆			◆	◆			
-	312516		◆	◆			◆	◆				◆	◆			◆	◆			

[1] *A coated version of the modules is also available for use where there are increased environmental requirements on temperature and humidity. The order numbers for the coated version of the modules are 314… rather than 312…*
[2] *without C-rail* [3] *with C-rail* [4] *can only be used in the automation system PSS 4000*

★ *Type recommended by Pilz for the majority of your applications*

Technical documentation on the decentralised periphery:

Webcode 0685

Online information at www.pilz.com

Selection guide – Decentralised I/O system

Part of PSS 4000

Link module cable

PSSu CB F

Type	Function
★ **PSSu CB F** [1)]	Base station used to extend the PSSu module bus by 100 m
★ **PSSu CR F** [1)]	Remote station used to extend the PSSu module bus by 100 m

Extension modules

PSSu XB F-T

PSSu XB F-T	Basis station used to extend the PSSu module bus by 0.5 m or 1 m, inside the control cabinet
PSSU XR F	Remote station used to extend the PSSu module bus by 0.5 m or 1 m, inside the control cabinet

Wireless link module and InduraNET p antennas

PSSu WB S IDN

PSS ANT 1 IDN

PSSu WB S IDN	Base station with antenna connection
PSSu WR S IDN	Remote station with antenna connection
PSS ANT 1 IDN	InduraNET p single antenna with 2 m cable
PSS ANT 2 IDN	InduraNET p dual antenna with 2 m cable

link modules

Application area	Order number	In use with ...
Standard/failsafe functions	312090	▸ PSSu BP 2/16 S ..... 312628 ▸ PSSu BP 2/16 C ..... 312629 ▸ PSSu BP-C 2/16 S ..... 312630 ▸ PSSu BP-C 2/16 C 312631
Standard/failsafe functions	312091	-

Standard/failsafe functions	314092	▸ PSSu BP 2/16 S ..... 312628 ▸ PSSu BP 2/16 C ..... 312629 ▸ PSSu BP-C 2/16 S ..... 312630 ▸ PSSu BP-C 2/16 C 312631
Standard/failsafe functions	314093	Connection cable PSSu A RJ45-CAB 1.5M 314094

Standard function	312095	▸ PSSu BP 2/16 S ..... 312628 ▸ PSSu BP 2/16 C ..... 312629 ▸ PSSu BP-C 2/16 S ..... 312630 ▸ PSSu BP-C 2/16 C 312631
Standard function	312096	-
Standard function	312995	-
Standard function	312995	-

[1] Can only be used in the automation system PSS 4000

★ *Type recommended by Pilz for the majority of your applications*

Technical documentation on the decentralised periphery:

Webcode 0685

Online information at www.pilz.com

Selection guide – Network components

Network components for SafetyBUS p

Router – Logical division of your bus architecture

- Galvanic isolation via optocoupler

Bridge – The link between two networks for rapid data transfer

- Galvanic isolation via optocoupler

Active Junction – Modular, flexible isolation of sub branches

- Galvanic isolation between the SafetyBUS p main branch and the sub branches via optocoupler
- Max. 3 A load current per sub branch, electronic short circuit protection
- Main branch: Female D-SUB connector (9-pin)
- Sub branches: 4-pin screw connectors

Active Junction Expansion – Expansion module for Active Junction

- Galvanic isolation between the SafetyBUS p main branch and the sub branches via optocoupler
- Max. 3 A load current per sub branch, electronic short circuit protection
- Sub branches: 4-pin screw connectors

PSS SB BRIDGE

PSS SB ACTIVE JUNCTION BASIS

Type	Function
PSS SB Router1	Segmentation for SafetyBUS p
PSS SB BRIDGE	Coupling device for SafetyBUS p
PSS SB ACTIVE JUNCTION BASIS	Active Y-junction with repeater function – Active Junction for SafetyBUS p
PSS SB ACTIVE JUNCTION EXPANSION	Expansion module for Active Junction for SafetyBUS p

Electrical data			SafetyBUS p		Size (H x W x D)	Order number
Galvanic isolation	Sub-branches	Virtual cable runs	Connection	Data width		
◆	-	-	2 female D-SUB connectors (9-pin)	-	140 x 170 x 50 mm	311 055
◆	-	-	2 female D-SUB connector (9-pin)	32 Bit as virtual input/ outputs (per SafetyBUS p network)	140 x 170 x 50 mm	301 131
◆	2	50 m	1 female D-SUB connector (9-pin)	-	94 x 49.2 x 126 mm	311 056
◆	2	-	-	-	94 x 26.5 x 121 mm	311 057

Technical documentation on network components:

Webcode 0685

Online information at www.pilz.com

Selection guide – SafetyBUS p® accessories

Bus connector for SafetyBUS p

PSS SB SUB-D4

PSS SB SUB-D4 DIAG

Type
PSS SB SUB-D4
PSS SB SUB-D4 DIAG
PSS SB SUB-D-F01

Bus cable for SafetyBUS p

PSS SB BUSCABLE0 MOVE

Type	Application range	
	Data transfer	Supply for field devices
PSS SB BUSCABLE0	◆	
PSS SB BUSCABLE0 MOVE	◆	
PSS SB BUSCABLE0 LC	◆	◆
PSS SB BUSCABLE0 HC	◆	◆

Network tester for SafetyBUS p

PSS SB TESTER

Type	Application range
PSS SB TESTER	Network tester for SafetyBUS p

Features	Order number
▸ Connector for SafetyBUS p ▸ Dimensions (H x W x D): 81 x 47 x 16 mm ▸ Female D-SUB connector, 9-pin ▸ Connection for permitted cable types PSS SB BUSCABLE0 and PSS SB BUSCABLE0 MOVE: IDC terminals, cable diameter: 7.6 … 8.2 mm ▸ Single-core cross section: max. 0.75 mm²	311 040
▸ Connector for SafetyBUS p ▸ Dimensions (H x W x D): 81 x 47 x 16 mm ▸ Female D-SUB connector, 9-pin ▸ Male D-SUB connector (diagnostics), 9-pin ▸ Connection for permitted cable types PSS SB BUSCABLE0 and PSS SB BUSCABLE0 MOVE: IDC terminals, cable diameter: 7.6 … 8.2 mm ▸ Single-core cross section: max. 0.75 mm²	311 041
▸ Fibre-optic coupler for SafetyBUS p ▸ Dimensions (H x W x D): 84 x 48 x 16 mm ▸ Female D-SUB connector, 9-pin ▸ Fibre-optic cable, ST connection for transmitter and receiver ▸ Graded index glass fibre 50/125 µm or 62.5/125 µm ▸ Eye safety: Laser Class 3a ▸ Supply voltage: 5 VDC through the bus subscriber's SafetyBUS p interface	311 053

Fixed installation	Plug connection	Mobile installation	Field installation	Wires	Order number
◆	◆			3	311 070
	◆	◆		3	311 071
◆			◆	4[1)]	311 074
◆			◆	4[1)]	311 076

[1)] plus shielding

Features	Order number
▸ Power supply: Ni-Cd battery, 4.8 VDC, 1,000 mAh ▸ Charger: 110/230 VAC, 50 Hz ▸ Display type: Single-colour graphic LC display ▸ Resolution: 128 x 64 pixels ▸ Interfaces: SafetyBUS p, USB ▸ Dimensions (H x W x D): 232 x 97 x 52 mm	German..... 311 090 English..... 311 091 French 311 092

Selection guide – Input module PSS67 and

PSS67 – Module

PSS67 F 16DI SB-T

Type	Function	Application area		Number of inputs (value)
		Failsafe functions	Standard functions	
PSS67 F 16DI SB-T	Digital inputs	◆		16

PSS67 – Cable

PSS67 Cable

Type	Function	Socket
PSS67 Cable M8sf M12sm	Sensor cable	M8
PSS67 Cable M8af M12sm	Sensor cable	M8
PSS67 Cable M12sf M12sm	Sensor cable	M12
PSS67 Cable M12af M12am	Sensor cable	M12
PSS67 Supply Cable IN sf OUT sm, B	Supply cable	-
PSS67 Supply Cable IN af OUT am, B	Supply cable	-
PSS67 Supply Cable IN sf, B	Supply cable	-
PSS67 Supply Cable IN af, B	Supply cable	-
PSS67 SB LC Cable IN sf OUT sm, A	SafetyBUS p cable	-
PSS67 SB LC Cable IN af OUT am, A	SafetyBUS p cable	-
PSS67 SB LC Cable IN sf, A	SafetyBUS p cable	-
PSS67 SB LC Cable IN af, A	SafetyBUS p cable	-

- *af = angled, socket*
- *sf = straight, socket*
- *sm = straight, connector*
- *am = angled, connector*
- *IN = incoming cable*
- *OUT = outgoing cable*

PSS67 – Adapter

PSS67 Adapter

Type
PSEN mag ad
PSEN cs ad
PSEN op1.1 ad
PSEN op1.2 ad
PSEN M8 M12 Transmitter ad
PSEN op 2H Receiver ad
PSEN op M12 V1 Receiver ad
PSEN op M12 V2 Receiver ad
PSEN T M12

accessories

Number of test pulse outputs (value)	Communications interfaces SafetyBUS p interfaces	Ambient temperature	Supply voltage	Dimensions (H x W x D)	Order number
4	1	-40 °C ... +60 °C	24 VDC	215 x 60 x 35.5 mm	311 300

Connector	Order number			
	3 m length	5 m length	10 m length	30 m length
M12	380 200	380 201	380 202	380 203
M12	380 204	380 205	380 206	380 207
M12	380 208	380 209	380 210	380 211
M12	380 212	380 213	380 214	380 215
-	380 250	380 251	380 252	-
-	380 253	380 254	380 255	-
-	380 256	380 257	380 258	-
-	380 259	380 260	380 261	-
-	380 500	380 501	380 502	-
-	380 503	380 504	380 505	-
-	380 506	380 507	380 508	-
-	380 509	380 510	380 511	-

Application area	Order number
Adapter for connection to PSENmag	380 300
Adapter for connection to PSENcode	380 301
Adapter for connection to PSEN op1.1 and PSEN op1.3	380 302
Adapter for connection to PSEN op1.2	380 303
Adapter for connection to PSEN op4F-s, PSEN op4H-s, PSEN op4F-m, PSEN op4H-m transmitter	380 304
Adapter for connection to PSEN op2H receiver	380 305
Adapter for connection to PSEN op4F-s, PSEN op4H-s, PSEN op4F-m, PSEN op4H-m receiver	380 306
Adapter for connection to PSEN op2B, PSEN op4F, PSEN op4H, PSEN op4B receiver	380 307
T-Adapter for connection to 2 PSEN	380 350

PSS system software

Solutions for the whole engineering process

Practical software solutions are available when designing and programming PSS safety and control systems – providing support from planning to diagnostics.

System software PSS WIN-PRO offers a wide function range

- Copy function – existing plant projects can be transferred into new projects
- Block encryption – to protect against manipulation and unauthorised access
- Language switching – for worldwide use
- Online handling – which makes troubleshooting easier in the test and commissioning phase

PSS WIN-PRO as full version or service version

PSS WIN-PRO is available as a full version and a service version. The full version contains the PVIS diagnostic concept, with which you can quickly and easily integrate unique plain text messages, location information and step-by-step instructions into your diagnostics.

The service version can be used to evaluate maintenance and diagnostic information.

Further information on PVIS can be found on page 68.

PSS WIN-PRO – Universal system software with practical tools

PSS WIN-PRO contains practical add-on tools to make configuration easier:

- PSSuniversal Startup Software – including the PSSuniversal Assistant for configuration and for the independent periphery test of the decentralised I/O system PSSuniversal
- SafetyBUS p Configurator – for configuration of the safe bus system SafetyBUS p
- Ethernet Configurator – for setting up complete Ethernet networks

The add-on tools are also available separately.

Your benefits at a glance

- PSS WIN-PRO available as full version and service version
- Practical add-on tools for rapid configuration of the whole control solution
- Copy function for existing plant projects
- Extensive selection of software function blocks
- Manipulation protection through block encryption
- Integrated PVIS diagnostic concept

Simple to program thanks to software function blocks

With an extensive selection of software function blocks for safety and control, we make it easier for you to program standardised control sequences. Instead of complex programming you just have to set the parameters – and that requires a lot less effort!

Software function blocks for the plant's safety-related section:

- To control and monitor presses, transfer lines, general emergency stop, safety gate and light grid functions
- To enter plant-specific parameters
- Approved by BG and TÜV

Software function blocks for the plant's standard section:

- Can be integrated into existing fieldbus and Ethernet networks via the relevant drivers
- Direct connection via communication modules or user interfaces

An overview of the function blocks can be found on page 66.

Keep up-to-date on system software:

Webcode 1531

Online information at www.pilz.com

Selection guide – System software

System software and configuration tools for PSS programmable safety and control systems

	Type	Features
	**PSS WIN-PRO CD** System software	▸ Programming software PSS WIN-PRO ▸ Windows-based user interface: German, English, French, Spanish (selectable) ▸ Programming languages: IL, LD, FBD (selectable) ▸ Online help ▸ Also contains: - PSSuniversal Assistant configuration software - PSSuniversal Startup Software - Ethernet Configurator - SafetyBUS p Configurator - Diagnostic concept PVIS
	**PSSuniversal Startup Software incl. PSSuniversal Assistant** Configuration and independent periphery test of the decentralised I/O system PSSuniversal	▸ Function test performed on a PSSuniversal system via the integral USB port, without the controller connected ▸ FS and ST outputs are switched on/off ▸ Input status display (supports the panel builder, for example, during the wiring test) ▸ Online help
	**PVIS OPC Server, PVIS ActiveX Control, PVIS OPC Configurator** Diagnostic software	▸ Diagnostics displayed on Pilz operator terminals PMIvisu, PMIopen or industrial computers, in accordance with the Pilz PVIS diagnostic concept ▸ The triggering fault is displayed along with step-by-step remedy information for the operator ▸ Diagnostic texts and remedies are created simply by selecting from the list of ready-made texts in PSS WIN-PRO ▸ Diagnostic data is called up from the control system through PVIS ActiveX Control or other OPC Clients ▸ Process data is called up from the control system through other OPC Clients (e.g. graphics software) ▸ PVIS OPC Server is configured via the PVIS OPC Configurator

Planning and product selection guides

Pilz Service Applications CD 2D and 3D product macros for EPLAN 5.70 and eCabinet	▸ User interface: German and English

System requirements	Order number
▸ Operating system: Windows® 2000 or XP ▸ Standard PC with min. 1 GHz processor ▸ RAM: min. 256 MByte ▸ Hard drive: ca. 500 MByte of available disk space	**PSS WIN-PRO software on CD** [1] ..... 301 290D **Full version for system configuration and programming** [2] ▸ Single-user licence (Basic) ..... 301 288B ▸ Additional licence (User) for an additional workstation ..... 301 288K ▸ Multi-user licence (Multi-User)..... 301 288M **Service version for starting/stopping the PSS system, maintenance and diagnostic information** [2] ▸ Single-user licence (Basic) ..... 301 289B ▸ Additional licence (User) for an additional workstation ..... 301 289K ▸ Multi-user licence (Multi-User)..... 301 289M
▸ Operating system: Windows® 2000 or XP ▸ Standard PC with min. 1 GHz processor ▸ RAM: min. 256 MByte ▸ Hard drive: ca. 100 MByte of available disk space	▸ Software CD-ROM..... 312 890 ▸ Single-user licence (Basic) [3] ..... 312 890B ▸ Additional licence (User) [3] for an additional workstation 312 890K
PVIS OPC Server and PVIS ActiveX Control: ▸ Operating system: Windows® 2000 or XP ▸ Standard PC with min. 1 GHz processor ▸ RAM: min. 256 MByte ▸ Hard drive: ca. 60 MByte of available disk space or ▸ PMIvisu, PMIopen **PVIS OPC Configurator:** ▸ Operating system: Windows® 2000 or XP ▸ Standard PC with min. 1 GHz processor ▸ RAM: min. 256 MByte ▸ Hard drive: ca. 100 MByte of available disk space	▸ Software CD-ROM..... 261 904 ▸ Runtime licence for Pilz PMI operator terminals (1:1 connection)..... 261 905 ▸ Runtime licence for Pilz PMI operator terminals (for up to 8 subscribers) ..... 261 906 ▸ Runtime licence for PC (1:1 connection)..... 261 907 ▸ Runtime licence for PC (unlimited subscribers) 261 908

[1] Also available with manual

[2] Further licensing conditions available on request

[3] Free licence for Startup Software PSSuniversal Assistant

Technical documentation on the system software:

Webcode 0685

Online information at www.pilz.com

▸ Operating system: Windows® 95, 98 and NT	301 995

Selection guide – Software function blocks

Software function blocks for functional safety (Safety)

Type	Function	Order number
PSS-SB-NOT **Emergency stop software package**	Software function blocks for monitoring and evaluating emergency stop functions	301 176…
PSS-SB-TRA **Transfer line software package**	Software function blocks for electrically monitored safety devices on interlinked plants	301 175…
PSS-SB-EXZ2 **Eccentric press software package**	Software function blocks for safety devices on eccentric presses or press lines	301 172…
PSS-SB-HYD **Hydraulic press software package**	Software function blocks for safety devices on hydraulic presses or press lines	301 173…
PSS-SB-AKAS **Fiessler-AKAS software package**	Software function block SB230 for controlling and monitoring the AKAS press brake protection device	301 188…
PSS-SB-AI2 **Analogue input software package**	Software function blocks for monitoring and reading analogue values from the PSS input modules	301 183…
PSS-SB-GTL **Tank farm installation software package**	Software function blocks to monitor safety-related functions on tank farm installations	301 177…
PSS-SB-FT **Burner management software package**	Software function blocks for flexible generation of programs to drive and monitor various types of burner	301 181…
PSS-SB-REGLER **Control engineering software package**	Software function blocks for failsafe control and monitoring of a burner's fuel/air ratio, plus a PID controller for regulating furnaces and process engineering functions	301 187…
PSS-SB-VSTOPP **Locked stop software package**	Software function blocks for bringing a plant to a locked stop and for preventing a machine from starting up unintentionally	301 184…
PSS-SB-SENSOR **IFM sensor software package**	Software function block for evaluating IFM's inductive safety switch	301 189…

Software function blocks for the standard section (Control)

Type	Application range	Order number
ST-SB-IBS-S **Driver software package**	Standard function blocks for INTERBUS-S Slave communication	301 253…
ST-SB-DP-S **Driver software package**	Standard function blocks for PROFIBUS-DP Slave communication	301 259…
ST-SB-RK512 **Driver software package**	Standard function blocks for RK512 passive	301 260…
ST-SB-DN-S **Driver software package**	Standard function blocks for DeviceNet-DN-Slave communication	301 262…
ST-SB-Mod RTU-S **Driver software package**	Standard function blocks for Modbus	301 263…
ST-SB-CANopen **Driver software package**	Standard function blocks for CANopen	301 266…
ST-SB-ControlNet **Driver software package**	Standard function blocks for ControlNet	301 268…
ST-SB-Ethernet **Driver software package**	Standard function blocks for Ethernet	301 273…
ST-SB-SER **Driver software package**	Standard function blocks for serial interface	301 279…
ST-SB-PSS-CNC Cyb **CNC software package for Cybelec**	Standard function blocks SB157 and SB158 for data exchange between a PSS and a Cybelec CNC controller	301 278…

When ordering: please state the code for the type of licence you require (B = Basic licence, K = Copy licence, U = Update licence, G = General licence).

Technical documentation on software function blocks:

Webcode 0685

Online information at www.pilz.com

Diagnostics made simple – With the diagn

PVIS®
Based on Pilz
Diagnostic Concept

Minimum downtimes

Plant and machinery must be producing. As efficiently and economically as possible, and without interruption. It's not until the machine suffers an unscheduled stop that you recognise the value of good, user-friendly diagnostics.

A sophisticated concept developed from practice is a prerequisite. At Pilz we call it PVIS for short. It's a universal diagnostic concept for small machines to large plants.

Two recognised factors were key for development. Machine manufacturers require programming to be simple, involving minimum effort. Operators, on the other hand, need clear, unambiguous instructions to enable them to rectify faults efficiently. PVIS satisfies both sides.

Configuration features

- Diagnostic projects are created with just a few clicks, using familiar programming software (PSS WIN-PRO or PNOZmulti Configurator).
- Pre-defined plain text messages and remedy messages are available for devices and blocks. Texts can be copied, adapted or created from new.
- All pre-defined texts are stored in multiple languages.
- Diagnostic messages can be extended based on bit and word information from the control systems.

Operational features

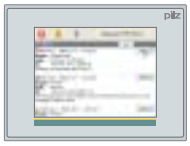
- Clear information on the fault that has occurred: The operator is able to act quickly in the event of a fault.
- Targeted support for trouble-shooting and fault recovery: This increases your ability to act in the case of a malfunction and thus your productivity. The remedy messages for the safety devices are already pre-defined and stored in the tools.
- Analysis included: For later analysis, PVIS stores every event with details of incoming and outgoing times in an "Event Log" ring memory.

PVIS event message components

- Plain text message for the event
- Remedy messages for each event (up to eight actions)
- Text-based location information on equipment identifier, scope and responsibility
- Messages are prioritised – the triggering event is always displayed first

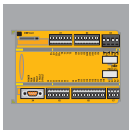
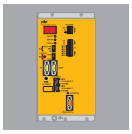
The texts are stored in the relevant PSS or SafetyBUS p project. For further details please refer to our System Description! Webcode 0685 www.pilz.com

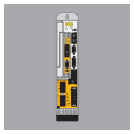
ostic concept PVIS®


Fits perfectly into any customer topology

PVIS



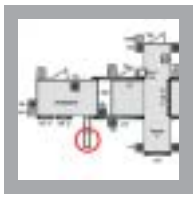

For safety systems, control systems, sensor technology and motion control

PVIS



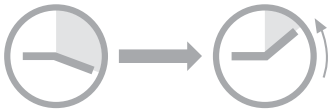
Configuration with just a few clicks


First failure detection



Graphical location information

Practical solution proposals – step-by-step



Save time during engineering

PVIS

Save time during operation

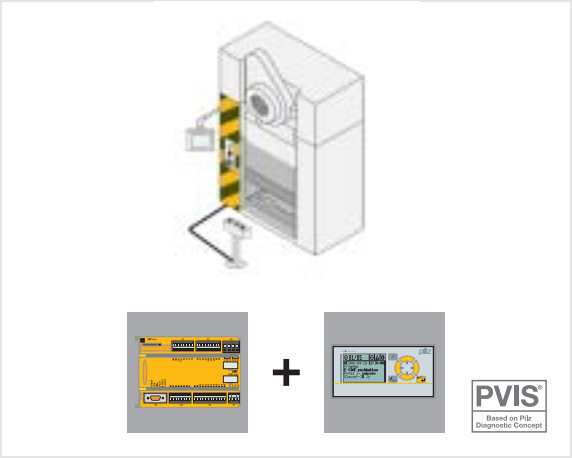
PVIS

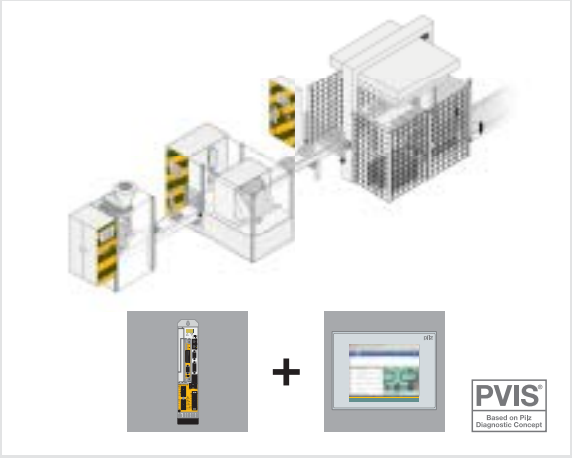
Keep up-to-date on the diagnostic concept PVIS:

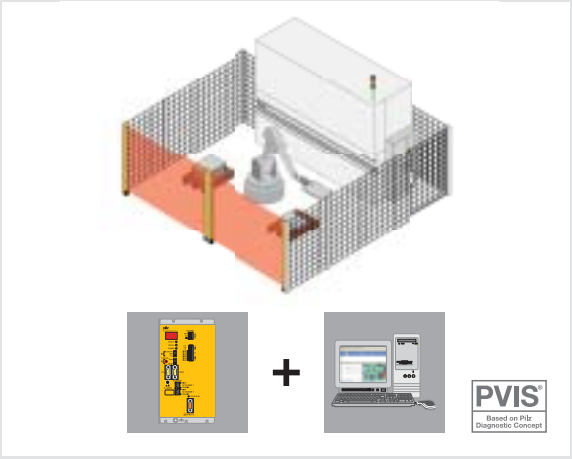
Webcode 1046

Online information at www.pilz.com

Wide range of application options







Universal diagnostic concept: From a small machine to a large plant – PVIS suits every application.

Benefits for machine operators

- Save time and money with error messages in plain text
- Practical solution proposals help to get production restarted quickly
- Simple to operate, without any knowledge of programming
- Machine-specific diagnostic solution thanks to an intelligent concept

Benefits for machine manufacturers and system integrators

- Use familiar software: PSS WIN-PRO or PNOZmulti Configurator
- Pre-defined error messages and step-by-step remedy messages for a large number of safety devices
- Save time with simple configuration: just a few clicks in the control system's software
- Pre-defined messages in multiple languages
- Flexible concept – easy to adapt pre-defined messages and add new messages

Keep up-to-date on the diagnostic concept PVIS:

Webcode 1046

Online information at www.pilz.com

Index

AT
Pilz Ges.m.b.H.
Sichere Automation
Modecenterstraße 14
1030 Wien
Austria
Telephone: +43 1 7986263-0
Telefax: +43 1 7986264
E-Mail: pilz@pilz.at
Internet: www.pilz.at

AU
Pilz Australia
Safe Automation
Suite C1, 756 Blackburn Road
Clayton, Melbourne VIC 3168
Australia
Telephone: +61 3 95446300
Telefax: +61 3 95446311
E-Mail: safety@pilz.com.au
Internet: www.pilz.com.au

BE LU
Pilz Belgium
Safe Automation
Bijenstraat 4
9051 Gent (Sint-Denijs-Westrem)
Belgium
Telephone: +32 9 3217570
Telefax: +32 9 3217571
E-Mail: info@pilz.be
Internet: www.pilz.be

BR
Pilz do Brasil
Automação Segura
Rua Ártico, 123 - Jd. do Mar
09726-300
São Bernardo do Campo - SP
Brazil
Telephone: +55 11 4126-7290
Telefax: +55 11 4126-7291
E-Mail: pilz@pilz.com.br
Internet: www.pilz.com.br

CH
Pilz Industrieelektronik GmbH
Gewerbepark Hintermättli
Postfach 6
5506 Mägenwil
Switzerland
Telephone: +41 62 88979-30
Telefax: +41 62 88979-40
E-Mail: pilz@pilz.ch
Internet: www.pilz.ch

CN
Pilz Industrial Automation
Trading (Shanghai) Co., Ltd.
Safe Automation
Rm. 704-706
No. 457 Wu Lu Mu Qi (N) Road
Shanghai 200040
China
Telephone: +86 21 62494658
Telefax: +86 21 62491300
E-Mail: sales@pilz.com.cn
Internet: www.pilz.com.cn

DE
Pilz GmbH & Co. KG
Felix-Wankel-Straße 2
73760 Ostfildern
Germany
Telephone: +49 711 3409-0
Telefax: +49 711 3409-133
E-Mail: pilz.gmbh@pilz.de
Internet: www.pilz.de

DK
Pilz Skandinavien K/S
Safe Automation
Ellegaardvej 25 L
6400 Sonderborg
Denmark
Telephone: +45 74436332
Telefax: +45 74436342
E-Mail: pilz@pilz.dk
Internet: www.pilz.dk

ES
Pilz Industrieelektronik S.L.
Safe Automation
Camí Ral, 130
Polígono Industrial Palou Nord
08401 Granollers
Spain
Telephone: +34 938497433
Telefax: +34 938497544
E-Mail: pilz@pilz.es
Internet: www.pilz.es

FI
Pilz Skandinavien K/S
Safe Automation
Nuijamiestentie 7
00400 Helsinki
Finland
Telephone: +358 9 27093700
Telefax: +358 9 27093709
E-Mail: pilz.fi@pilz.dk
Internet: www.pilz.fi

FR
Pilz France Electronic
1, rue Jacob Mayer
BP 12
67037 Strasbourg Cedex 2
France
Telephone: +33 3 88104000
Telefax: +33 3 88108000
E-Mail: siege@pilz-france.fr
Internet: www.pilz.fr

GB
Pilz Automation Technology
Safe Automation
Willow House, Medlicott Close
Oakley Hay Business Park
Corby
Northants NN18 9NF
United Kingdom
Telephone: +44 1536 460766
Telefax: +44 1536 460866
E-Mail: sales@pilz.co.uk
Internet: www.pilz.co.uk

IE
Pilz Ireland Industrial Automation
Cork Business and Technology Park
Model Farm Road
Cork
Ireland
Telephone: +353 21 4346535
Telefax: +353 21 4804994
E-Mail: sales@pilz.ie
Internet: www.pilz.ie

IT
Pilz Italia Srl
Automazione sicura
Via Meda 2/A
22060 Novedrate (CO)
Italy
Telephone: +39 031 789511
Telefax: +39 031 789555
E-Mail: info@pilz.it
Internet: www.pilz.it

JP
Pilz Japan Co., Ltd.
Safe Automation
Shin-Yokohama Fujika Building 5F
2-5-9 Shin-Yokohama
Kohoku-ku
Yokohama 222-0033
Japan
Telephone: +81 45 471-2281
Telefax: +81 45 471-2283
E-Mail: pilz@pilz.co.jp
Internet: www.pilz.jp

KR
Pilz Korea Ltd.
Safe Automation
9F Jo-Yang Bld. 50-10
Chungmuro2-Ga Jung-Gu
100-861 Seoul
Republic of Korea
Telephone: +82 2 2263 9541
Telefax: +82 2 2263 9542
E-Mail: info@pilzkorea.co.kr
Internet: www.pilzkorea.co.kr

MX
Pilz de México, S. de R.L. de C.V.
Automatización Segura
Circuito Pintores 170
Cd. Satélite
Naucalpan, Méx. 53100
Mexico
Telephone: +52 55 5572 1300
Telefax: +52 55 5572 1300
E-Mail: info@mx.pilz.com
Internet: www.pilz.com.mx

NL
Pilz Nederland
Veilige automatisering
Postbus 186
4130 ED Vianen
Netherlands
Telephone: +31 347 320477
Telefax: +31 347 320485
E-Mail: info@pilz.nl
Internet: www.pilz.nl

...
In many countries we are represented by sales partners.

Please refer to our homepage for further details or contact our headquarters.

NZ
Pilz New Zealand
Safe Automation
5 Nixon Road
Mangere
Auckland
New Zealand
Telephone: +64 9 6345350
Telefax: +64 9 6345352
E-Mail: t.catterson@pilz.co.nz
Internet: www.pilz.co.nz

PL
Pilz Polska Sp. z o.o.
Safe Automation
ul. Marywilska 34H
03-231 Warszawa
Poland
Telephone: +48 22 8847100
Telefax: +48 22 8847109
E-Mail: info@pilz.pl
Internet: www.pilz.pl

PT
Pilz Industrieelektronik S.L.
R. Eng Duarte Pacheco, 120
4 Andar Sala 21
4470-174 Maia
Portugal
Telephone: +351 229407594
Telefax: +351 229407595
E-Mail: pilz@pilz.pt
Internet: www.pilz.pt

RU
Pilz RUS OOO
Mjachkovsky bulvar d.31/19 office 2
Moscow 109469
Russian Federation
Telephone: +7 495 346 4110
E-Mail: pilz@pilzrussia.ru
Internet: www.pilzrussia.ru

SE
Pilz Skandinavien K/S
Safe Automation
Energigatan 10 B
43437 Kungsbacka
Sweden
Telephone: +46 300 13990
Telefax: +46 300 30740
E-Mail: pilz.se@pilz.dk
Internet: www.pilz.se

TR
Pilz Emniyet Otomasyon
Ürünleri ve Hizmetleri Tic. Ltd. Şti.
Kayışdağı Cd. Beykonağı Plaza
No:130 K:2 D:2
Ataşehir/İstanbul
Turkey
Telephone: +90 216 5775550
Telefax: +90 216 5775549
E-Mail: info@pilz.com.tr
Internet: www.pilz.com.tr

US CA
Pilz Automation Safety L.P.
7150 Commerce Boulevard
Canton
Michigan 48187
USA
Telephone: +1 734 354 0272
Telefax: +1 734 354 3355
E-Mail: info@pilzusa.com
Internet: www.pilz.us

Technical support
+49 711 3409-444
support@pilz.com

DAT - I - 010/05

Pilz GmbH & Co. KG
Felix-Wankel-Straße 2
73760 Ostfildern, Germany
Telephone: +49 711 3409-0
Telefax: +49 711 3409-133
E-Mail: pilz.gmbh@pilz.de
Internet: www.pilz.com

5-4-2-0-018, 2010-04 Printed in Germany