Automation system PSS 4000 – Simplify your automation™

PILZ
THE SPIRIT OF SAFETY

- Multi-master communication concept
- Scalable, decentralised hardware structures
- Easy-to-use configurator




Automation system PSS 4000 – Simplify your automation™

Automation system PSS 4000

Using the automation system PSS 4000 allows you to automate safely! Standalone applications through to networked plant and machinery can easily be implemented with PSS 4000.
Coordinated hardware and software are available for this purpose, as well as the real-time Ethernet SafetyNET p and the web-based visualisation software PASvisu.

With the Industrie 4.0-compatible automation system PSS 4000 you can put your trust in a future-proof system!

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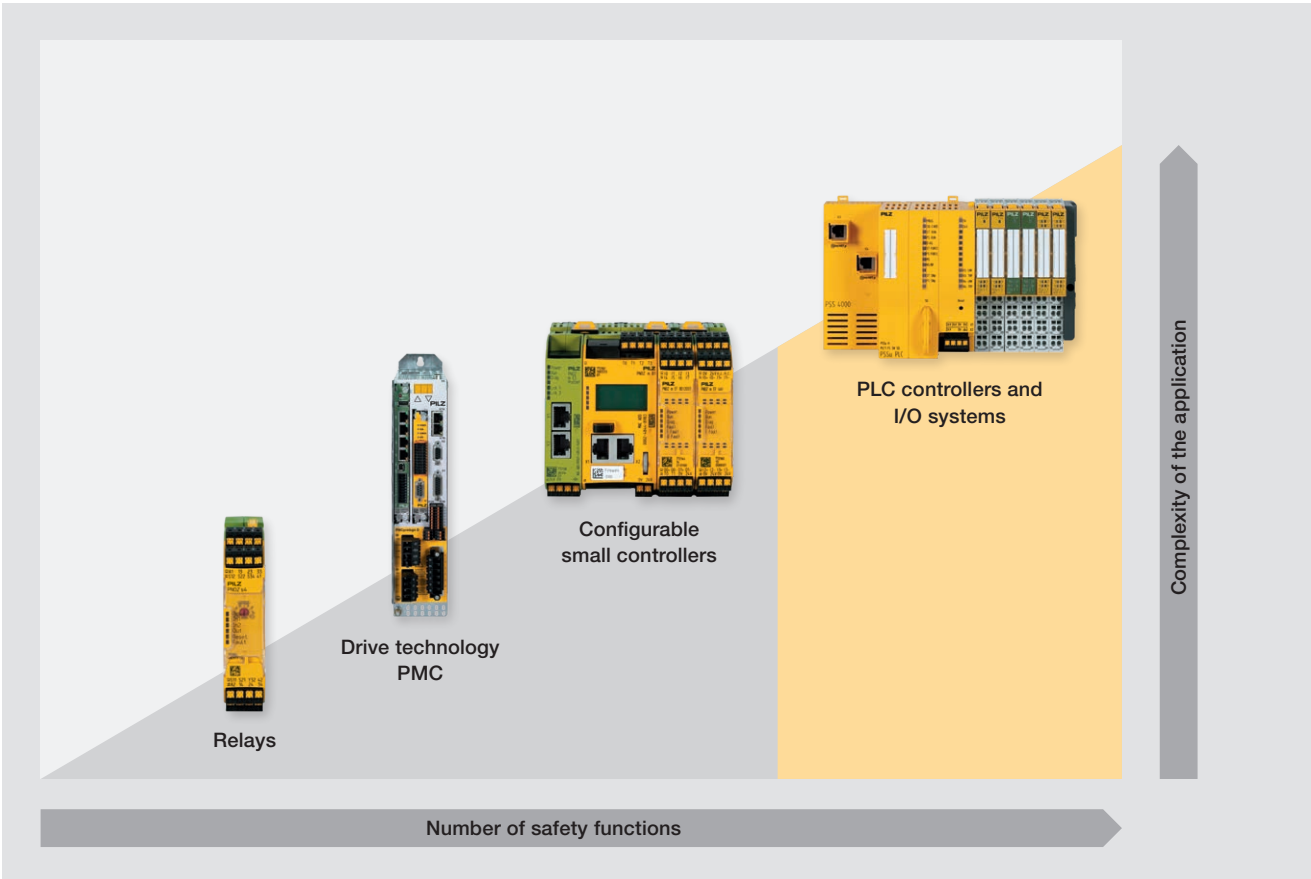
The right control technology for your requirements!

Pilz is a technology leader and full-service provider in safe control technology. Our safety controllers are used around the world and have proven themselves over decades. Trust in our expertise in machinery safety: We have the right solution for all your needs! Always in focus: The safe shutdown of hazardous movements and the smooth control of your machinery.

Safety is our core competency, which is why our claim is to automate plant and machinery such that the safety of human, machine and the environment is always guaranteed.



Advantages of safe control technology from Pilz

- Processing of safety and automation functions
- Monitoring of all common safety functions
- High plant availability, protection of your employees, increase of cost effectiveness
- Protection of your employees through safety up to Performance Level e of EN ISO 13849-1 and SIL CL 3 of EN IEC 62061
- Optimum automation solutions for your requirement
- Simplicity, convenient operation and intuitive configuration
- Flexibility and modular expandability – our solutions grow with your plant
- Proven Pilz technology with quality that you can rely on

	Relays	Configurable small controllers	PLC controllers and I/O systems	Controller PMCprimo	Safety card PMCprotego S
Safety functions Emergency stop, light curtains, safety gates and much more	◆	◆	◆		
Project creation/engineering tool ▸ Graphic configuration ▸ Programming in accordance with EN IEC 61131-3		◆	◆ ◆	◆ ◆	◆
Motion monitoring ▸ Standstill, speed ▸ Complex functions	◆	◆ ◆	◆ ◆	◆	◆
Networking ▸ Ethernet ▸ Fieldbuses		◆ ◆	◆ ◆	◆ ◆	◆ ◆
Diagnostics and visualisation ▸ Hardware diagnostics/LED ▸ PASvisu visualisation	◆	◆ ◆	◆ ◆	◆	◆
Automation functions PID controllers, counter monitoring, speed recognition and detection and much more			◆	◆	

Keep up-to-date on controllers and I/O systems:

Webcode: web150080

Relays:

Webcode: web150079

Configurable small controllers:

Webcode: web225263

Drive technology:

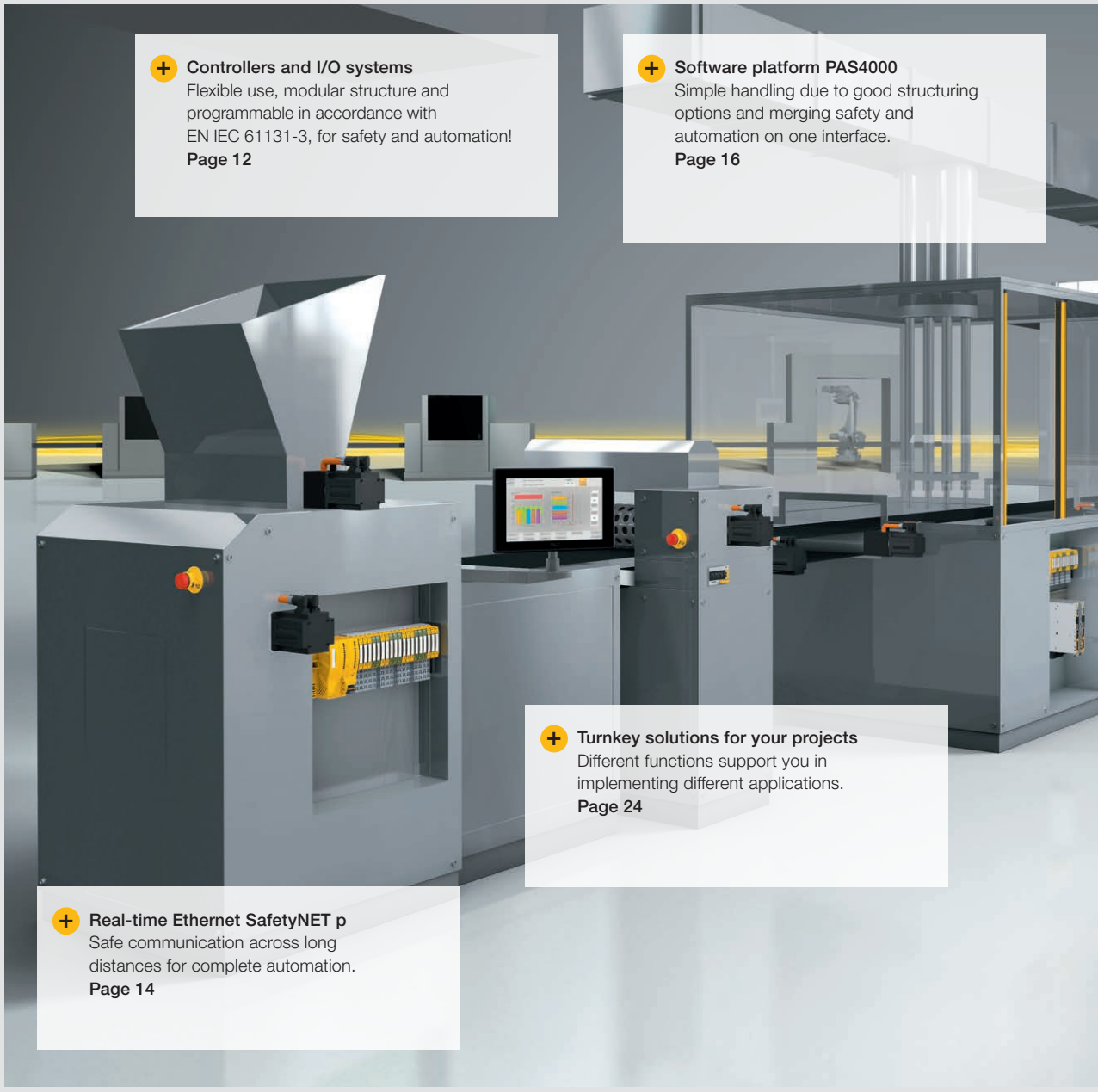
Webcode: web150506

Online information at www.pilz.com

The automation system PSS 4000...

Do you have a complex application with a number of requirements and do you want a simple solution for your automation? Welcome to the world of the automation system PSS 4000. Our core product combines safety and automation in one system. Due to its varied functions, it is ready for use with a wide range of applications. You will benefit from a scalable modular system whose components are perfectly coordinated with one another.

... Your solution for safe automation:



Controllers and I/O systems
Flexible use, modular structure and programmable in accordance with EN IEC 61131-3, for safety and automation!
Page 12

Software platform PAS4000
Simple handling due to good structuring options and merging safety and automation on one interface.
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Turnkey solutions for your projects
Different functions support you in implementing different applications.
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Real-time Ethernet SafetyNET p
Safe communication across long distances for complete automation.
Page 14

Watch this film to see what makes the difference with the automation system PSS 4000.

Visualisation software PASvisu
The automation system PSS 4000 always in view: both locally and by remote access.
Page 20

Firewall SecurityBridge
Protects against manipulation of your production plant by unauthorised parties.
Page 22

Applications and approvals
PSS 4000 is your solution for numerous applications and different sectors of industry.
Page 26

Your benefits at a glance

- High level of flexibility thanks to modular system structure
- Safety and automation in one system
- Solution for Industrie 4.0
- Simple, standardised handling across the whole project
- Easy programming and configuration with the PAS4000 software
- Web-based visualisation with the PASvisu software
- Open system by connecting to different communication protocols
- Can be used in all sectors of industry

This is how you benefit from the automation system

With the automation system PSS 4000 you have the optimum system for all phases of automation: engineering/configuration, commissioning and operation.

Safety and automation in one system

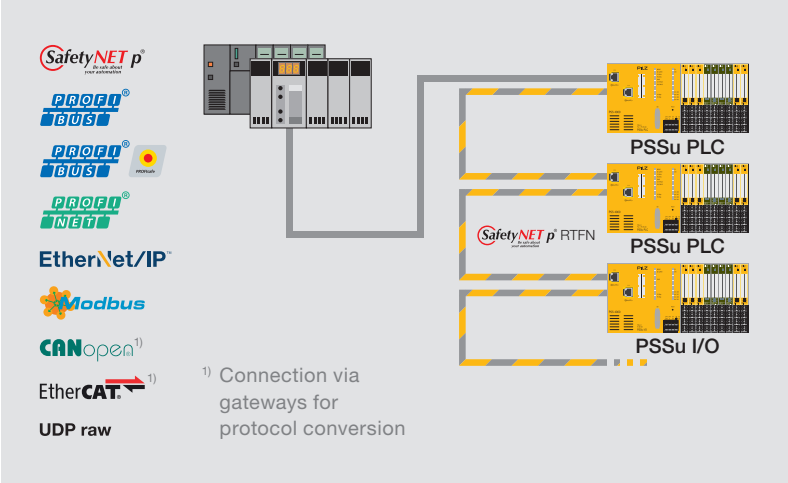
For simple communication exchange, use one environment for safety and automation, in which hardware and software are intelligently dovetailed. The system is physically mixed but logically separated, so it operates without feedback. The communication network's protocol structure guarantees stable network transfer. Telegrams containing safety-related information, such as a person entering a plant's danger zone, arrive safely at the intended recipient.

A large number of standardisation options make it possible to easily reuse machine elements and data.

Supports modular plants

Whereas in classical automation, a standalone, centralised controller monitors the plant or machinery and processes all the signals, the PSS 4000 allows control functions to be distributed consistently (multi-master system). Process or control data, failsafe data and diagnostic information are exchanged and synchronised via Ethernet. This means that it makes no difference to the control function where the associated program section is processed. Instead of a centralised controller, a user program distributed in runtime is made available to the user within a centralised project. All network subscribers are configured, programmed and diagnosed via this centralised project. This enables simple, standardised handling across the whole project.

PSS 4000



Integration into existing plants.

Open system for enhanced flexibility

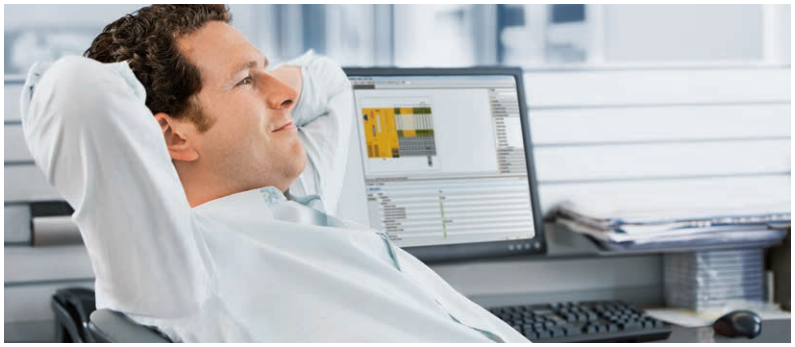
The automation system PSS 4000 is an open system that can be integrated into existing automation architectures without difficulty. The controllers PSSuniversal PLC and PSSuniversal multi can be docked into a primary third-party controller – and perform safety and automation functions.

Reduced engineering – shorter project runtimes

On many automation systems, the hardware must be selected for configuration/programming without exception. Subsequent modifications are very costly.

On PSS 4000 it's different: the hardware can be selected and the program divided on the hardware at a later point in the process because it is largely independent of the configuration stage.

- Shorter project runtimes because subtasks can run in parallel: possibility to select the hardware and divide the program on the hardware at a very late point in the process
- Subsequent machine expansions: user program can be distributed to another controller without any great effort
- Partial commissioning and partial operation of individual machine parts



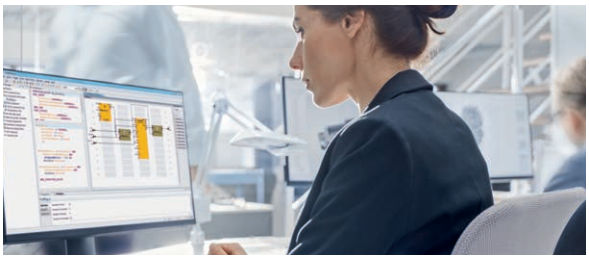
Up to 30 % less engineering thanks to hardware-independent project creation.

Firewall SecurityBridge – protect your controller

With the firewall SecurityBridge you protect the automation system PSS 4000, for example, against manipulation through unauthorised access. It is connected upstream of the PLC controller PSSuniversal PLC and functions as a VPN server. This banishes the spectre of espionage and manipulation, and guarantees the safety of your employees and the availability of your machinery!
For more information, see page 22.

Engineering software PAS4000 – simple programming

With PAS4000 you can create programs for safety and automation quickly and intuitively using just one interface. You can choose between the graphics program editor PASmulti or the programming languages in accordance with EN IEC 61131-3: PAS STL (Structured Text), PAS LD (Ladder Diagram) and PAS IL (Instruction List). The comprehensive library of safety-related and non-safety-related software blocks make creating automation programs easy.



Visualisation software PASvisu – easy overview

The PASvisu web-based visualisation software allows you to keep a close eye on the automation system PSS 4000: both locally and by remote access. You can link PASvisu directly to the control project from the software PAS4000. In this way, you benefit from shorter project runtimes, faster engineering and reduced potential for error.
Further information on PASvisu is available on page 20.

Real-time Ethernet SafetyNET p – pure communication

In addition to the connection to communication networks such as EtherNet/IP, EtherCAT, Modbus TCP, PROFINET and PROFIBUS-DP, the controllers PSSuniversal PLC also have a SafetyNET p communication interface. SafetyNET p is the backbone of the whole system. Various infrastructure components such as switches allow the network to be adapted to the plant structure. Gateways are also available to connect to various third-party controllers.

More intelligence with the multi-master design

Automation of the future requires solutions that can distribute control intelligence and are still easy to use. The automation system PSS 4000 makes this possible. Multiple controllers with identical authorisation rights are connected simply via the real-time Ethernet SafetyNET p. SafetyNET p exchanges data and state information between the controllers and synchronises it. In PAS4000, you program and configure all network subscribers centrally. That makes handling your project really simple, however large it is!

Keep up-to-date on the industry of the future:

Webcode: web150609

Online information at www.pilz.com

Safety for rail transport

We developed the automation system PSS 4000 as a R(ail) variant specifically for railway technology. It corresponds to the specifications from CENELEC and is robust against electromagnetic interference, extreme temperatures and mechanical loads. It enables a clear path for safe railway applications up to SIL 4!

Keep up-to-date on solutions for railway technology:

Webcode: web8485

Online information at www.pilz.com

Safety despite high temperature fluctuations

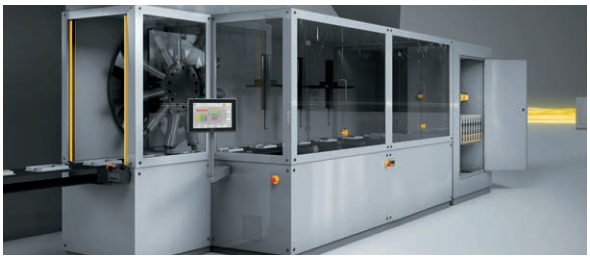
For harsh environments and high temperature fluctuations, we offer the automation system as a T(emperature) variant. The specified operating temperature range is from –40 °C to +70 °C. In addition, the modules are protected against condensation in compliance with pollution degree 2. This variant is suitable for applications such as wind turbines and cable cars. In many cases, using these modules means there is no need for additional climate control measures, reducing costs considerably.

Controllers and I/O systems

Part of PSS 4000

Controllers and I/O systems are available in the automation system PSS 4000 in protection types IP20 and IP67 for both simple and demanding applications. This means that we can offer you a suitable solution for every automation task:

ALL IN ONE SAFETY & AUTOMATION



PSSuniversal multi – perfect for small plants

The controllers PSSuniversal multi can be used as small controllers in a system network – with PSSuniversal PLC and PSS 4000 I/O class I/O systems – or on a standalone basis. They are suitable for standalone machines or small interlinked plants. They are configured and programmed using the graphics program editor PASmulti.

Keep up-to-date on controllers PSSuniversal:

Webcode: web150420

PSSuniversal PLC – the all-rounders

Controllers PSSuniversal PLC are all-rounders in the automation system PSS 4000. You can use them as a "classical" central PLC for safety and automation or as a distributed system. You can configure and program them in the main EN IEC 61131-3 languages. The portfolio is rounded off with PSS67 PLC, the controller with protection type IP67 for use outside the control cabinet!

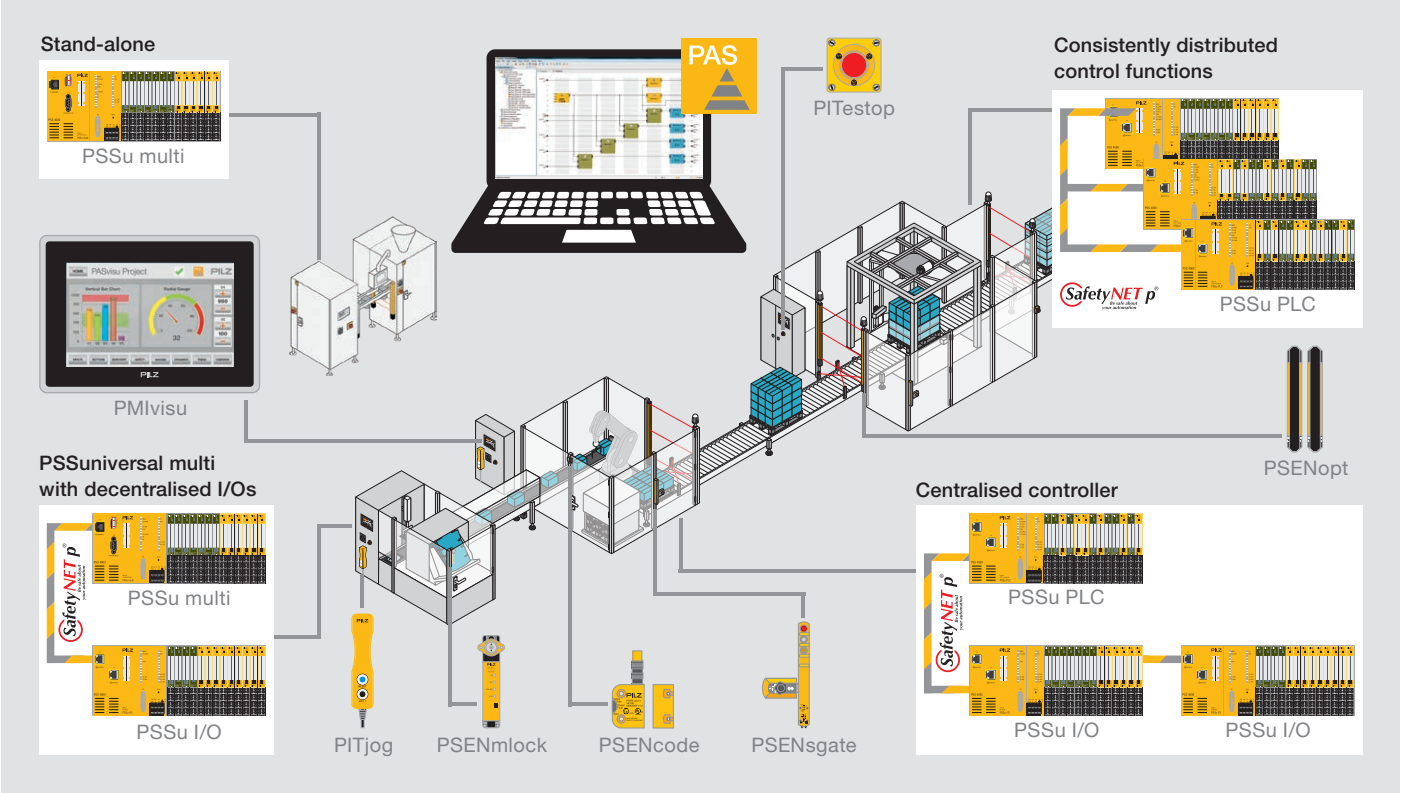
Keep up-to-date on PSSuniversal – PSS 4000 communication modules:

Webcode: web84782

Online information at www.pilz.com

PSS 4000 I/O – decentralised networking

The PSSuniversal I/O and PSS67 I/O modules are used for decentralised networking and for transferring safety-related and non-safety-related signals at field level. Using PSSuniversal I/O, it is possible to implement a wide range of applications by connecting up to 64 I/O modules. Due to the IP67 protection class of I/O block PSS67, it is perfect for installation without a control cabinet!



The automation system is suitable for a wide variety of automation tasks.

Modular system structure

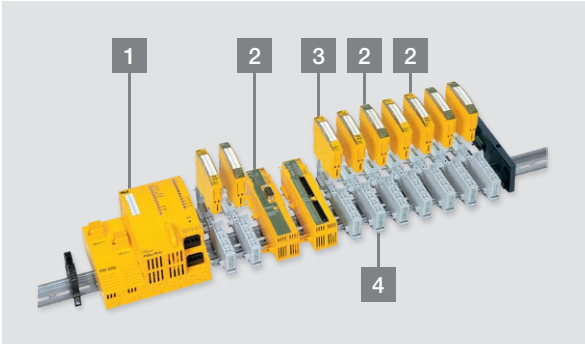
Assemble the input and output modules on your control systems and I/O systems individually to suit your requirements. This way you can tailor the system structure to your precise needs. If subsequent adaptations are required, modules can simply be expanded or exchanged.

1 Head modules
Various head modules are available in the performance classes PLC, multi and I/O.

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. Compact modules with high packing density are also available.

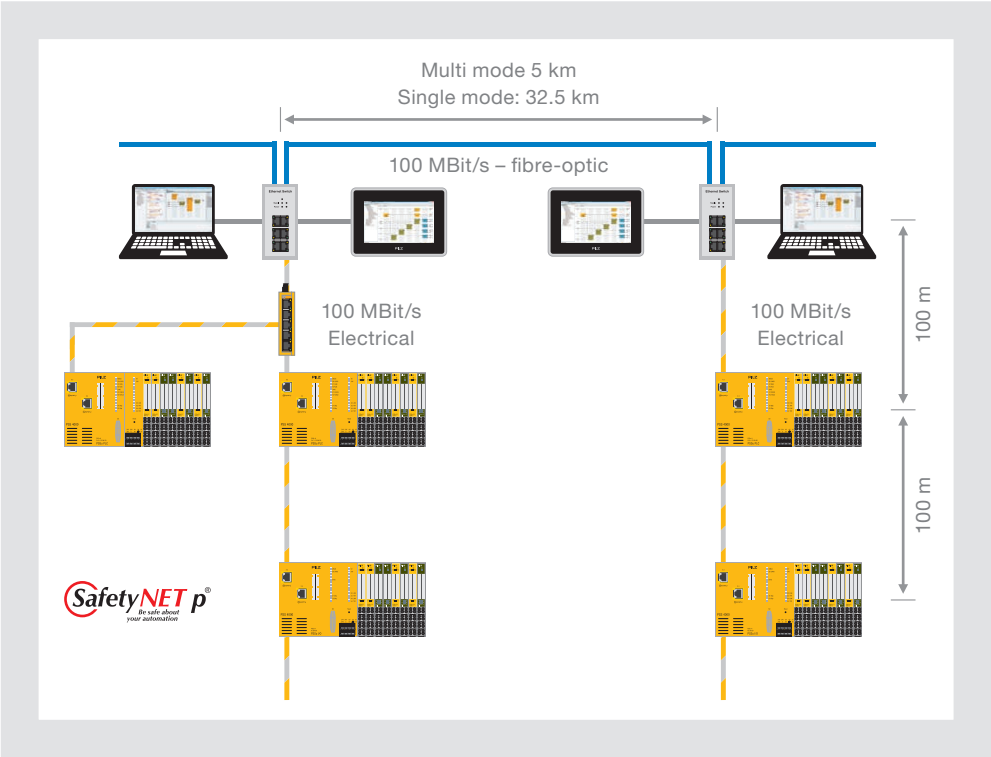
3 Supply voltage modules
These modules can be used as "refresh modules".

4 Base modules
Carrier units for the input and output modules and for the supply voltage modules. These are simply plugged onto the base modules and are easy to change when adjustments are made to the system.



Real-time Ethernet SafetyNET p®

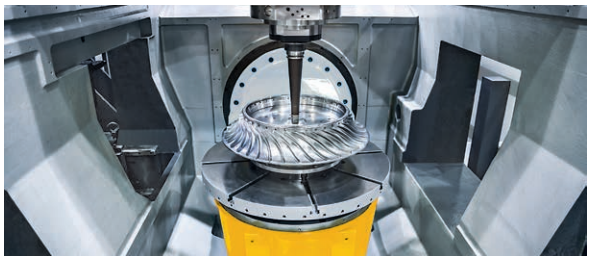
The real-time Ethernet SafetyNET p is designed for complete automation. The open system allows time-critical control data to be transmitted – for automation and for safety-related applications (within the scope of the Machinery Directive). The safety mechanisms in SafetyNET p are designed in such a way that faults do not necessarily have to lead to the application stopping. This ensures high availability of the plant/machinery. SafetyNET p is the backbone of the automation system PSS 4000.



SafetyNET p in use with a variety of network components.

One system for the entire automation technology
SafetyNET p allows safety-related data to be transmitted over the same cable on which non-safety-related data is also being transmitted. The whole network is universally based on standard Ethernet in accordance with IEEE 802.3.

This safe communication was developed in accordance with relevant standards such as EN IEC 61508 and is suitable for safety-related applications PL e of EN ISO 13849 and SIL 3 of EN IEC 62061. All safety mechanisms are encapsulated in the protocol itself and are hidden for the user. SafetyNET p functions according to the black channel principle. This means that, apart from the safe bus subscribers, all the other network components are not considered to be safety-related.



Wide-ranging application options

The real-time Ethernet SafetyNET p can be flexibly employed with a variety of network components. This enables a classic (electric) twisted pair cabling, allowing a distance of up to 100 metres to be bridged between subscribers. Fibre-optic communication can be used to bridge greater distances. Cable lengths of 5 kilometres in multi mode technology and 32.5 kilometres in single mode technology can be implemented – delivering immunity to interference, particularly in the case of applications where enhanced resistance to electromagnetic disturbances is required.

Another alternative that is available is DSL technology, which permits distances of up to 10 kilometres. In applications in which cables would interfere or cannot be used, wireless communication can be used. To transmit SafetyNET p wirelessly, WLAN from the range compliant with IEEE-802.11 can be employed.

Coexistence capability and routing

SafetyNET p is 100 % Ethernet, which allows different Ethernet protocols to be run on the same network at the same time. This means that both the usual IT protocols and other automation protocols can be run in parallel.

The real-time Ethernet is also routing capable. What this means is that larger groupings of machines and machine components can be networked in defined segments with the customary IT methods. This can be done using standard commercial infrastructure components. As a result, SafetyNET p supports full flexibility when designing your applications and network topologies.

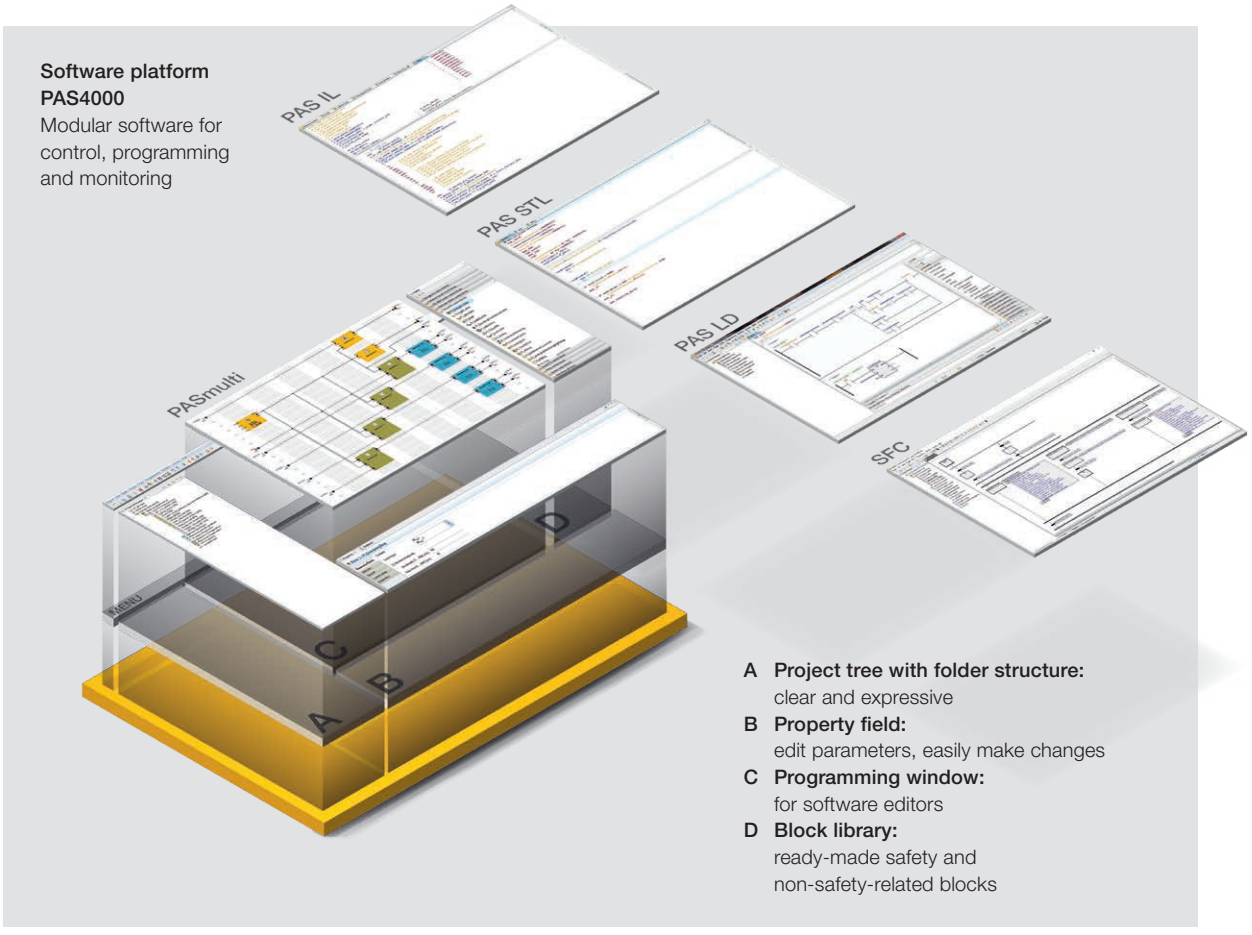
Infrastructure components for powerful communication networks

Modern automation solutions place extreme demands on the communication network. The use of suitable Ethernet infrastructure allows the network to be adapted to the plant structure.

Network availability can be enhanced by implementing a variety of network components. Industrial cabling solutions assist rapid, error-free installation. Available infrastructure components include switches (with and without management functions), cables, connectors and gateways for connection to third-party networks.

Software platform PAS4000®

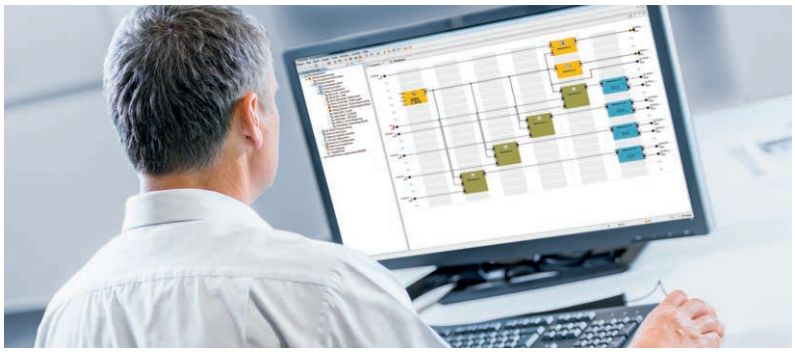
The software platform PAS4000 makes configuration and programming of the automation system PSS 4000 simple. The PAS4000 comprises several editors for PLC programming and configuration as well as software blocks. In PAS4000, the tools for configuration, programming, commissioning and operation are closely matched to each other. The data interfaces are standardised, making information easier to exchange in all phases of automation. The control systems PSSuniversal PLC can be programmed in PAS IL (Instruction List), PAS STL (Structured Text), PAS LD (Ladder Diagram) and SFC (Sequential Function Chart) in accordance with EN IEC 61131-3. The graphics program editor PASmulti is also available for simple configuration and programming of PSSuniversal PLC and PSSuniversal multi. PAS4000 contains a comprehensive language package. All tool texts and tutorials are available in various languages.



Program editor PASmulti – for simple configuration and structuring

It's easier than it's ever been to create programs quickly and intuitively using the program editor PASmulti of the automation system PSS 4000. A comprehensive library of automation and failsafe blocks enables a high level of reusability.

- Use the mouse for wiring: You can drag and drop inputs and outputs to freely configure and logically link them.



Program editor PASmulti

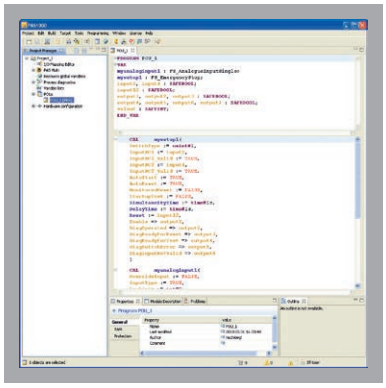
- Two worlds, standardised handling: Whether you are programming in the IEC world or configuring with PASmulti, the programming environment is the same, which makes handling extremely easy.
- For automation and safety tasks.

Editors for PLC programming for safety and automation

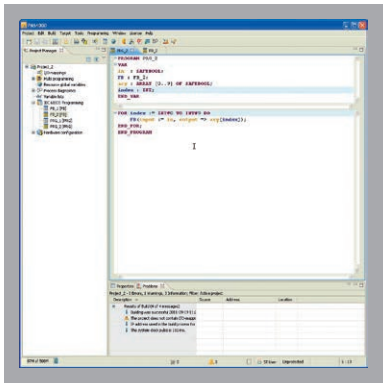
The controllers PSSuniversal PLC can be programmed as programmable logic controllers for automation and safety tasks in accordance with EN IEC 61131-3. The editors PAS IL (Instruction List), PAS STL (Structured Text), PAS LD (Ladder Diagram) and SFC (Sequential Function Chart) are classified by TÜV Süd as LVL (Limited Variability Languages). This means that the editors for PLC programming meet the requirements for creating safety-related user software.

The PLC programming languages can also be combined quite simply with the program editor PASmulti.

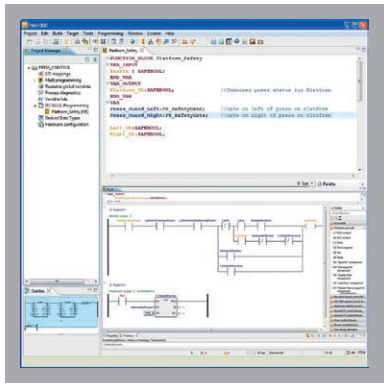
- **Safety** and **automation** in one system
- Simple handling for complex tasks
- Simple combination of PAS IL, PAS STL, PAS LD and PASmulti as well as SFC enables structured working and clear programs
- Comprehensive library for automation and safety blocks



Editor PAS IL (Instruction List)



PAS STL (Structured Text)



PAS LD (Ladder Diagram)

Keep up-to-date on the software platform PAS4000:

Webcode: web 150424

Online information at www.pilz.com

Software platform PAS4000®

Blocks – reusability and standardisation

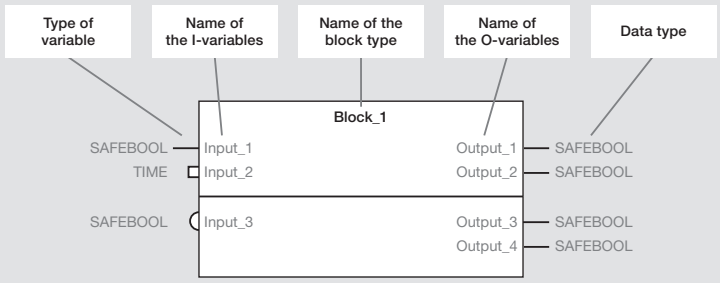
On the software platform PAS4000, you have available an extensive library of ready-made safety and non-safety-related blocks that you can easily reuse in your projects. Blocks you create yourself, e.g. in PAS STL (Structured Text), can be used with PASmulti – in the same way as ready-made blocks. Blocks can be combined, enabling you to define more complex functions.

- Projects are organised and structured by function.
- Blocks can be reused as often as you like.
- Changes in the block are documented and managed centrally.

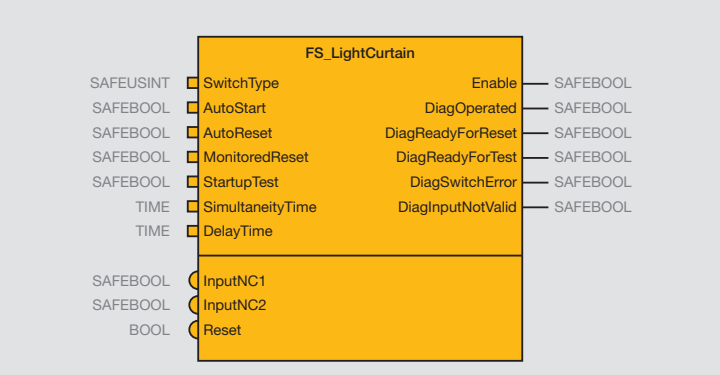
Diverse and wide-ranging: Software blocks

- In addition to general control blocks such as PID (function of a PID controller) and scaling (scaling input values), safety-related, TÜV certified blocks are also available to monitor functions such as emergency stop pushbuttons, light curtains, safety gate switches, etc.
- Hardware-related blocks (e.g. FS_AbsoluteEncoder) provide driver blocks for specific hardware modules.
- Application-related blocks (e.g. FS_CamController) are used to create your press applications or in burner management.

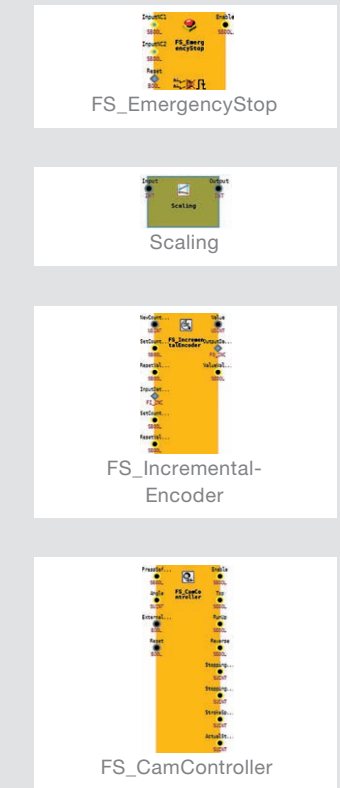
The PAS4000 software blocks can be found directly within the tool in the software library.



Design of a software block.



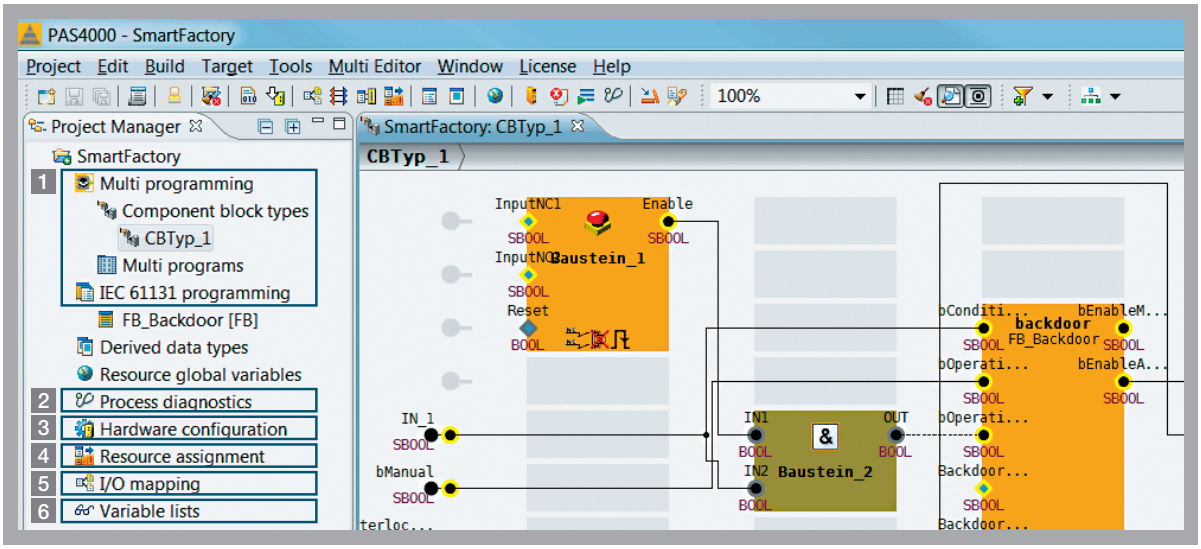
Example of a failsafe block.



Keep up-to-date on the software platform PAS4000:

Webcode: web150424

Online information at www.pilz.com



Project Manager – simple and clearly arranged

With PAS4000, projects can be managed simply and clearly. The project tree in the tool helps with orientation:

1 Programming

The program can be created independently of the hardware, various editors are available for programming in accordance with EN IEC 61131-3 and for configuration (Multi programming).

2 Process diagnostics

Using the diagnostic editor, a diagnosis message can be assigned quickly and simply to each variable in the user program. As a result, you have system and user diagnostics available in one system.

3 Hardware configuration

The configuration of the PSSuniversal systems, consisting of head module and I/O modules, is defined in the hardware configurator.

4 Resource assignment

This is where you define which section of the user program is to be executed on which resource (controller) in the safety or automation section.

5 I/O mapping

The variables from the process image are linked to the actual hardware signals. The program is built and is downloaded to the controller(s).

6 Variable list

The dynamic program display and variable list help you to commission your machine quickly.

PAS4000 Online Help – fast and comprehensive

The online help can be called up directly within the tool and offers a diverse range of support. In addition to a getting started section and information on general software handling, you can also find information about subjects such as hardware configuration, diagnostics within the tool and the PAS4000 licensing model. Tips and tricks, which are adapted with each new software version, complete the online help.

Automation system always in view

Your automation projects can be managed using the web-based visualisation software PASvisu for simple configuration and optimum visualisation. So you can achieve a convenient, comprehensive overview of your plant locally and via remote access! PASvisu displays your automation projects in a way that's visually attractive thanks to the most diverse range of style sheets.

Your benefits at a glance

- Accelerated projects: from engineering through to runtime to maintenance
- Link between control and PASvisu projects enables shorter project times
- Faster engineering, as variables do not need to be entered and assigned manually
- Flexible use on a multitude of end devices – thanks to platform independence
- Language switching: create, export and import languages
- Data logging: logging of variables and export via CSV file
- Advanced trend tile: display of logged trends, targeted filtering by elapsed time and addition of dynamic trend lines
- Integrated recipe manager for convenient definition of the data sets for your machine visualisation

Perfectly tailored to the visualisation panels PMIvisu

Your plant visualisation is optimally displayed on the Pilz Human Machine Interface PMIvisu. The software is already preinstalled and licensed on the visualisation panels PMI v7e and PMI v8. With this combination, you can visualise and diagnose all functions of the small controllers PNOZmulti via direct connection.

Connecting to the automation system PSS 4000

The web-based visualisation software PASvisu is perfectly matched to the automation system PSS 4000 from Pilz. This means its control software PAS4000 can easily be linked to the visualisation software PASvisu. The result is a perfect blend of control system and visualisation – for all the phases of the machine's lifecycle.

PMIvisu – the visualisation terminal for PASvisu

Pilz's PMIvisu offers a pre-installed and licensed solution package that consists of the operator terminals PMI with the web-based visualisation software PASvisu. This allows you to carry out professional visualisation of plant and machinery at a glance.

PMIvisu eco – visualisation panels with pre-installed visualisation software

The cost-optimised PMIvisu eco operator panels PMI v7e are equipped with the visualisation software PASvisu. As a result, the visualisation of your machinery can be performed easily with all information at a glance!

- Visualisation software PASvisu installed and licensed
- Linux operating system
- Can be connected to PNOZmulti or a third party OPC UA server
- High-resolution capacitive glass TFT displays
- Display sizes from 4.3" and 7"
- Interfaces: 1 x USB
- PMI Manager

PMIvisu – visualisation panels with pre-installed visualisation software

With the PMIvisu operator panels PMI v8 you receive a complete package for professional diagnostics and visualisation of plant and machinery with the preinstalled and licensed visualisation software PASvisu.

- Visualisation software PASvisu installed and licensed
- Operating system Windows 10 IoT
- Can be connected to PNOZmulti and PSS 4000 or a third party OPC UA server
- High-resolution capacitive glass TFT displays
- Display sizes from 7" and 12.1"
- Interfaces: 2 x GbE, 1 x HDMI, 1 x VGA, 1 x USB 3.0, 2 x USB 2.0
- PMI Assistant

Keep up-to-date on PMIvisu:

Webcode: web160789

Online information at www.pilz.com

Firewall SecurityBridge

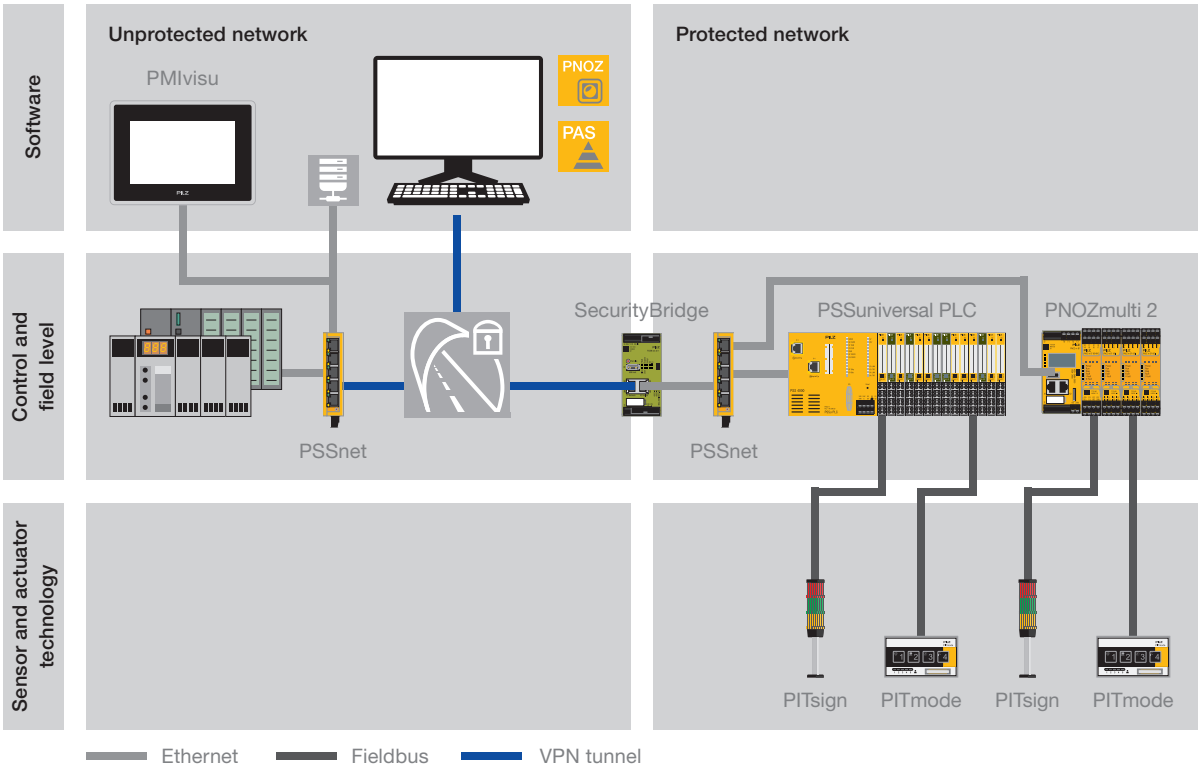
If people, machinery and industrial processes are intelligently linked, they are also more susceptible to attack. So how do you protect your controllers against manipulation? We offer you the optimum solution with the SecurityBridge! The SecurityBridge protects controllers from manipulation and unauthorised access.

PCOM ser br1

We as a supplier of safe automation solutions are committed to the protection of people against dangers arising from a machine (functional safety) as well as protection of the machinery against people (industrial security). For this reason, we have developed our firewall, the SecurityBridge, using a secure development process in accordance with the standard IEC 62443-4-1 and had it certified by TÜV Süd in combination with IEC 62443-3-3.

The firewall SecurityBridge protects against:

- Unauthorised access by monitoring the communication
- Manipulation through authentication and permission management
- Unauthorised changes by monitoring projects of the control and automation systems



The SecurityBridge prevents unauthorised access to its downstream devices.

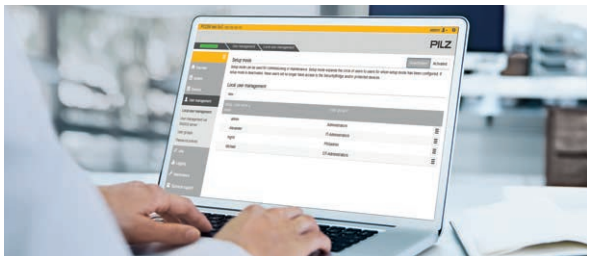
Keep up-to-date on firewall SecurityBridge:

Webcode: web188268

Online information at www.pilz.com

Package filtering

The firewall SecurityBridge monitors the communication between controllers to be protected and the programming and visualisation PCs or service computers. It functions as a package filter: only necessary data (authorised configuration and process data) is transmitted. The SecurityBridge can thus be easily integrated into existing plants. Due to its unique design, it offers the option of rapid forwarding of process data with minimum latency. This is particularly advantageous for applications with time-critical process data.



User management via the Security-Bridge web server.

User management

To ensure that controller project data is protected against manipulation or incorrect operation, only authorised personnel with the corresponding training and instruction is allowed access to the controllers. The SecurityBridge web server can be used as a central authentication server for this purpose. In addition to the user name and password, the role of the employee is also defined there. This ensures that only authorised persons are given access to the protected product.

Protected access via VPN

To ensure that authenticated personnel can safely exchange data with a system, the SecurityBridge offers a standardised VPN solution. As a result a service PC can be part of the protected network. To accomplish this, a VPN client on the service PC establishes an encrypted connection to the firewall. Authentication is performed in the next step. A check is performed here as to which person on which devices is allowed access to the protected zone and if so, with which permissions.

Your benefits at a glance

- TÜV SÜD-certified and developed in accordance with IEC 62443-4-1 and IEC 62443-3-3
- Protection against manipulation of data through authentication and authorisation management
- Increases plant availability because only required data (authorised configuration and process data) is transferred
- Forwarding of low-latency process data
- Reveals unauthorised changes to the project by monitoring the check sum (CRC)
- Prevents unauthorised access because downstream devices are in a protected network
- Only suitably authorised users can make changes to a project's configuration

Keep up-to-date on the operating mode selection and access permission system PITmode:

Webcode: web150439

Online information at www.pilz.com

An all-round safe solution

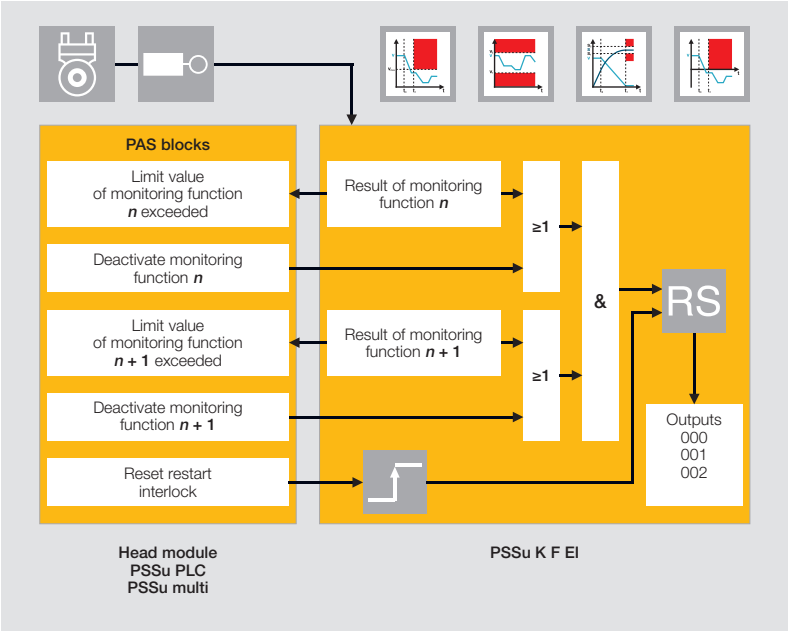
It is also possible to combine this with our operating mode selection and access permission system PITmode fusion in order to utilise another factor for two-factor authentication.

Turnkey solutions for your projects

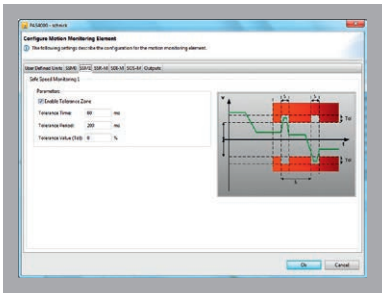
The automation system PSS 4000 is characterised by the perfect interaction between individual components and software elements. Various functions, such as safe motion monitoring for example, help you to implement your applications.

Safe motion monitoring within the automation system PSS 4000

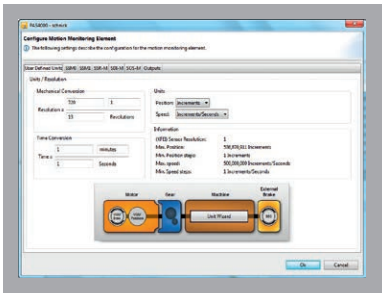
On the automation system PSS 4000, the safe monitoring function is completely integrated within the user software. Two different measuring principles, and therefore different functions, can be implemented.



Safe motion monitoring – with one encoder.



Simple setting of safe speed functions.



Assistant for unit calculation.

Safe motion monitoring with one encoder

A compact I/O module (which can be combined with the controllers PSSuniversal PLC or PSSuniversal multi) is available for safe monitoring of up to eight axes per controller up to PL d, with only one encoder. You benefit from reduced reaction times and increased productivity due to a local fast shutdown – irrespective of the PLC cycle time.

Benefits of the solution:

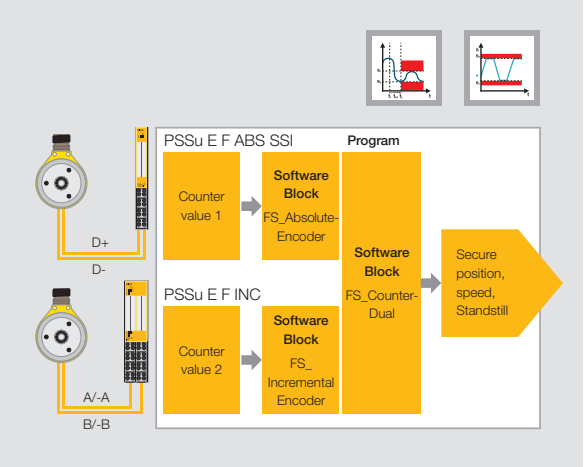
- Reduced reaction times, higher productivity
- Errors are minimised and projects can be implemented quickly due to the simple setting of speed functions in the software
- Fast commissioning, maintenance and service due to simple diagnostics of the set limit values and parameters via the tool
- Use of existing encoders
- Implementation of safety functions in accordance with EN 61800-5-2:
  - up to PL d with only one Sin/Cos encoder
  - up to PL e with a safety-related encoder
  - up to PL e with combination of encoder and proximity switch, with additional gear monitoring

Safe position monitoring with two encoders

In the automation system PSS 4000, "safe speed" and "safe position" are possible due to the combination of counter modules, special function blocks in the user program and two non-safety-related encoders.

Benefits of the solution:

- Safe evaluation of speed, position and standstill using non-safety-related encoders
- The safe monitoring function is transferred to the user software
- Greater flexibility when monitoring limit values due to dynamic limit value monitoring in the user program



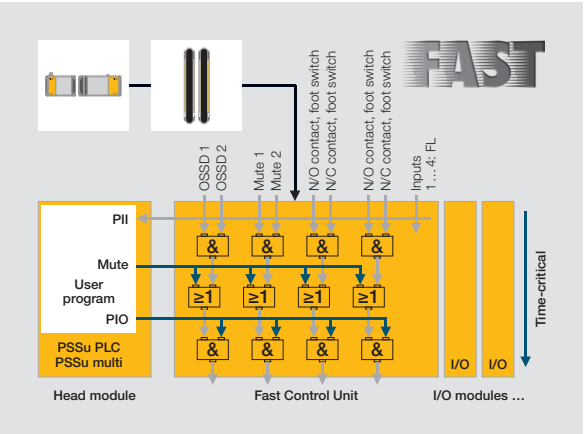
Safe speed, safe position – with two encoders.

Fast Control Unit for fast switching operations

The Fast Control Unit is the first compact I/O module to contain a high-performance, safe logic function. Local safe inputs can be switched to the outputs with minimum time loss (400 µs). Particularly short and time-critical signals (650 µs pulse duration) can also be read in.

Benefits of the solution:

- Flexibility and highest switching speed
- Flexible and freely programmable due to full access to the I/O signals in the control program
- As fast as the fixed wired option due to the local logic function
- Optimised shutdown process on inductive loads due to reverse voltage



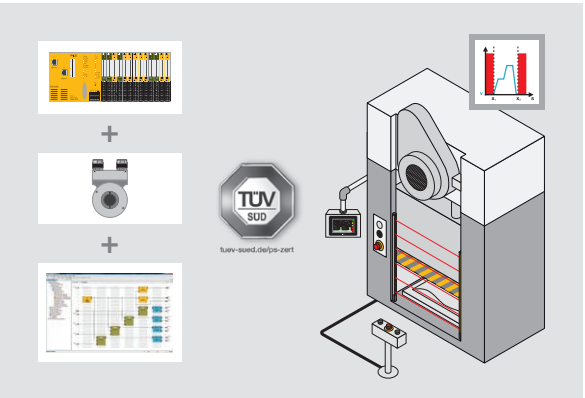
Signals are forwarded directly and rapidly.
The user program has read and write access.

Safe electronic rotary cam arrangement

The optimum solution for a universal controller for mechanical presses: the safe electronic rotary cam arrangement PSS 4000. The solution consists of the controller PSSuniversal PLC, press blocks (CamController) and the rotary encoder PSENenco. This solution replaces conventional mechanical rotary cam arrangements.

Benefits of the solution:

- Safe cams for run-up and overrun with dynamisation for a safe stop at TDC with a variable number of strokes
- Continuous overrun measurement to minimise down times
- Support for adjustment of the stroke length through adoption of the electrical angle
- Excellent manipulation protection



Safe electronic rotary cam arrangement – approved safety solution compliant with EN 692.

Tried and tested in numerous sectors of industry

Our extensive expertise in a wide range of applications has been brought to bear in the automation system PSS 4000. It has already been tried and tested in a large number of sectors of industry. Here are just a few examples!

Automotive industry

The automation system is used in body making and final assembly. It has been implemented, for example, at Yanfeng Plastic Omnium on a paint line for bumpers. The big advantage of the PSS 4000 here is not just that it supports the numerous safety functions in a large plant; rather, if the customer so desires, it guarantees extension of the system with more I/O modules.

Rail technology

The automation system PSS 4000 has already been tried and tested in rail technology. At Bombardier Transportation GmbH, the PSS 4000 monitors specified travel speeds and initiates emergency braking in the case of uncontrolled acceleration. At the intersection point of three underground routes in the centre of Antwerp, the SIL 4-capable industry-proven automation system PSS 4000 replaces obsolete control boards.

Specific approvals – more than the industry requires

The automation system PSS 4000 has specific approvals and complies with standards that enable it to be used in other industries (in addition to classical mechanical engineering).

… in the railway sector:

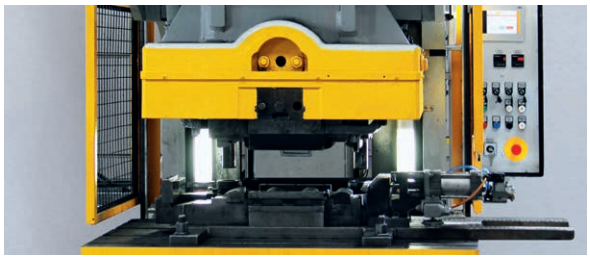
- Relevant railway standards: EN 50121-3, EN 50121-3-2, EN 50121-4, EN 50155, EN 50126, EN 50128, EN 50129, for safety functions in accordance with SIL 2, SIL 3, SIL 4

… in the lifts/escalators sector:

- EN 81-1/2: European lift standard, describes the construction of lifts
- EN 115-1: European standard, describes the safety of escalators and moving walks

Packaging technology

At a well-known Swiss manufacturer of potato crisps, the automation system PSS 4000 monitors the safety-related functions of the packaging line and replaces the configurable control system PNOZmulti that was used previously. It increases productivity without having a negative effect on logistic processes or accessibility.



Presses

The PSS 4000 has also proved itself in the case of press applications. Pilz was brought on board to retrofit an eccentric press, for example. The mechanical rotary cam arrangement was replaced by the complete solution consisting of the controller PSSuniversal PLC from the automation system PSS 4000, the special software blocks and the rotary encoder PSENenco. As a result the eccentric press complies with the latest standards after retrofitting.

Transport and logistics

In the area of logistics, Pilz used the PSS 4000 to implement a fully automatic uprighting system at Sietatec, which positions the lifting frames for fork-lift trucks. The automation system PSS 4000 focuses on transporting the lifting frames in the plant as well as on cross traffic of the automated guided vehicle systems – without any collisions occurring.

Apart from this, the automation system PSS 4000 is used in many other areas:

- Bridge protection: monitoring and control of the safety-related functions of a vertical-lift bridge
- Cable cars: the realisation of cable car applications, e.g. fibre-optic cable applications for long distances
- Amusement parks: controlling of motors and recording positions and speed
- Stage technology: monitoring of stage hoists, speed and rotational direction
- Automated guided vehicle systems: monitoring of the speed and travel direction of individual transport units
- Fire protection systems: safe monitoring and control of fire protection systems
- Escalators: safety solutions and concepts for all types of escalators
- Wind energy: safe motion monitoring of wind turbines

Technical details of controllers and I/O systems

Common features

- PSSuniversal module bus for connection of up to 64 I/O modules for automation and safety functions
- Integral power supply
- Integrated switch function for SafetyNET p linear topology
- SD card to store the device project and configuration data
- International safety standards:
  – EN IEC 61508 up to SIL CL 3
  – EN ISO 13849 up to PL e

Controllers PSSuniversal PLC

PSSuniversal PLC

Type	Certification
PSSu H PLC2 FS SN SD	CE, TÜV, cULus Listed
PSSu H PLC2 FS SN SD-T	CE, TÜV, cULus Listed
PSSu H PLC1 FS DP SN SD	CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed
PSSu H PLC1 FS SN SD M12-T	CE, TÜV, cULus Listed
PSS67 PLC1 16FDI	CE, TÜV, cULus Listed

Two versions of the controllers are available:

- PSSuniversal PLC with two SafetyNET p interfaces
- PSSuniversal PLC with SafetyNET p and PROFIBUS-DP interface (Slave)

Controllers PSSuniversal multi

PSSuniversal multi

Type	Certification
PSSu H m F DP SN SD	CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed
PSSu H m F DP ETH SD	CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed
PSSu H m F DPsafe SN SD	CE, EAC (Eurasian), TÜV, cULus Listed

Three versions of the controllers are available:

- PSSuniversal multi with SafetyNET p and PROFIBUS-DP interface (Slave)
- PSSuniversal multi with Ethernet and PROFIBUS-DP interface (Slave)
- PSSuniversal multi with SafetyNET p and PROFIBUS/PROFIsafe interface (Slave)

Decentralised system PSS 4000 I/O

PSSuniversal I/O

Type	Certification
PSSu H FS2 SN SD	CE, TÜV, cULus Listed
PSSu H FS2 SN SD-T	CE, TÜV, cULus Listed
PSSu H FS SN SD M12-T	CE, TÜV, cULus Listed
PSSu H FS SN SD M12-R	CE, TÜV, cULus Listed
PSS67 IO1 16FDI	CE, TÜV, cULus Listed

Keep up-to-date on the controllers in the automation system PSS 4000

Webcode: web150420

and communication modules:

Webcode: web84782

Online information at www.pilz.com

Technical features	Order number
▸ Safety and automation functions ▸ Can be configured with the graphics program editor PASmulti ▸ Programming in PAS IL (Instruction List), PAS STL (Structured Text), PAS LD (Ladder Diagram) and SFC (Sequential Function Chart) in accordance with EN IEC 61131-3 ▸ Programming via Ethernet TCP/IP ▸ Max. number of failsafe tasks: 9 ▸ Max. number of standard tasks: 9	312077 314077 312071 314071
16 safe inputs with IP67 protection – suitable for use in the extended temperature range (0 °C to +70 °C)	316020

Technical features	Order number
▸ Local safety functions ▸ Programming via graphics program editor ▸ Max. number of failsafe tasks: 1 ▸ Devices with SafetyNET p interface: max. number of SafetyNET p connections: 5	312065 312060 312066

Technical features	Order number
▸ Communication with other SafetyNET p devices (RTFN) ▸ Module bus for non-safety-related I/O modules	312087 314087 314086 315086
▸ IP67 protection for cabinet-free installation	316010

Technical details of PSSuniversal I/O modules

Supply voltage modules

Type	Automation functions	Failsafe functions	Technical features
PSSu E F PS-P		◆	Periphery power supply, passive (24 V periphery)
PSSu E F PS		◆	Power supply, passive (24 V periphery and 5 V system)
PSSu E F PS1		◆	Power supply, buffered (24 V periphery and 5 V system)
PSSu E F PS2		◆	Power supply, buffered (24 V periphery and 5 V system)

Digital I/O modules

PSSu E S 4DI	◆		4 inputs
PSSu E S 4DO 0.5	◆		4 outputs (0.5 A)
PSSu E S 4DO 0.5-TD	◆		4 digital outputs (0.5 A)
PSSu E S 2DO 2	◆		2 digital outputs (2A)
PSSu E S 2DO 2-TD	◆		2 digital outputs (2A)
PSSu E S 2DOR 2	◆		2 relay outputs, volt-free, 2 A
PSSu E S 2DOR 10	◆		3 relay outputs, volt-free, 10 A
PSSu E F 4DI		◆	4 inputs
PSSu E F 4DO 0.5		◆	4 outputs, single-pole, 0.5 A
PSSu E F 2DO 2		◆	2 outputs, single-pole, 2 A
PSSu E F 2DOR 8		◆	2 relay outputs, volt-free, 8 A
PSSu E F DI OZ 2		◆	1 input, 1 output, dual-pole 2 A
PSSu K S 16DI	◆		16 digital inputs
PSSu K S 8DI 8DO 0.5	◆		8 digital inputs, 8 digital outputs (0.5 A)
PSSu K S 16DO 0.5	◆		16 digital outputs (0.5 A)

Analogue I/O modules

PSSu E S 2AI U	◆		2 inputs (0 … 10 V se; 0 … 10 V dif; -10 … 10 V dif)
PSSu E S 4AI U	◆		4 inputs (0 … 10 V se)
PSSu E S 2AI I se	◆		2 inputs (0 … 20 mA; 4 … 20 mA)
PSSu E S 2AO U	◆		2 outputs (0 … 10 V; -10 … 10 V)
PSSu E S 4AO U	◆		4 outputs (0 … 10 V)
PSSu E S 2AO I	◆		2 outputs (0 … 20 mA; 4 … 20 mA)
PSSu E S 2AI RTD	◆		2 analogue inputs, resistance thermometer
PSSu E S 2AI TC	◆		3 analogue inputs, thermocouples
PSSu E F AI I		◆	1 input (0 … 25 mA), passive
PSSu E F AI U		◆	1 input (–10 … +10 V), passive
PSSu E AI SHT1	◆		1 analogue input, 2 analogue outputs (0 … 0.6 A; 0 … 20 mA)
PSSu E AI SHT2	◆		1 analogue input, 2 analogue outputs (0 … 0.2 A; 0 … 20 mA)

Certification	Order number		
CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed	312185	314185	-
CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed	312190	314190	-
CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed	312191	314191	-
CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed	312192	314192	-
CE, TÜV, cULus Listed	312400	314400	312401
CE, TÜV, cULus Listed	312405	314405	312406
CE, cULus Listed	-	314406	-
CE, TÜV, cULus Listed	312410	314410	312411
CE, cULus Listed	-	314411	-
CE, cULus Listed	312511	314511	-
CE, TÜV, cULus Listed	312510	314510	-
CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed	312200	314200	-
CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed	312210	314210	-
CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed	312215	314215	-
CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed	312225	314225	-
CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed	312220	314220	-
CE, TÜV, cULus Listed	312430	-	-
CE, TÜV, cULus Listed	312431	-	-
CE, TÜV, cULus Listed	312432	-	-
CE, TÜV, cULus Listed	312440	314440	-
CE, cULus Listed	312445	314445	-
CE, TÜV, cULus Listed	312450	314450	-
CE, TÜV, cULus Listed	312460	314460	-
CE, cULus Listed	312465	314465	-
CE, cULus Listed	312470	314470	-
CE, TÜV, cULus Listed	312490	314490	-
CE, TÜV, cULus Listed	312500	314500	-
CE	312260	314260	-
CE	312265	314265	-
CE, EAC (Eurasian), TÜV, cULus Listed	312261	314261	-
CE, cULus Listed	312262	-	-

Extended temperature range

Expanded diagnostic functions in the automation sector

Keep up-to-date on PSSuniversal I/O modules:

Webcode: web150421

Online information at www.pilz.com

Technical details of PSSuniversal I/O modules

Modules with special functions

Type	Automation functions	Failsafe functions	Technical features
PSSu K F FCU		◆	Fast Control Unit, 12 digital inputs, 2 digital outputs (single-pole, 2 A), 2 digital outputs (dual-pole, 2 A)
PSSu K F FAU B		◆	Fast Control Unit, evaluation device for PSENvip 2, basic version; 4 digital inputs, 2 digital outputs (single-pole, 2 A), 2 digital outputs (dual-pole, 2 A)
PSSu K F FAU P		◆	Fast Control Unit, evaluation device for PSENvip 2, productive version; 4 digital inputs, 2 digital outputs (single-pole, 2 A), 2 digital outputs (dual-pole, 2 A)

Encoder modules

PSSu E S ABS SSI	◆		1 absolute encoder SSI
PSSu E S INC	◆		1 incremental encoder
PSSu E S INC 24V se	◆		1 incremental encoder 24 V
PSSu E F ABS SSI [1]		◆	1 absolute encoder SSI
PSSu E F INC [1]		◆	1 incremental encoder
PSSu K F EI		◆	Encoder interface, for connection and evaluation of encoders (Sin/Cos, TTL, HTL, proximity switches 24 V)
PSSu K F EI CV		◆	Encoder interface, for connection and evaluation of encoders (Sin/Cos, TTL, HTL, proximity switches 24 V)
PSSu K F INC		◆	1 incremental encoder, including socket for easy rotary encoder connection

Distribution modules

PSSu E PD	◆		Voltage distribution, passive (24 V)
PSSu E PD1	◆		Voltage distribution, passive (4 potentials)
PSSu E PS-P 5V	◆		Periphery power supply 5 V
PSSu E PS-P +/-10V	◆		Periphery power supply +/–10 V
PSSu E PS-P +/-15V	◆		Periphery power supply +/–15 V

Communication modules

PSSu E S RS232	◆		Serial interface RS232
PSSu E S RS485	◆		Serial interface RS485
PSSu K S RS232	◆		Serial interface RS232, including socket for connecting serial connectors, with driver for Modbus ASCII

Link modules

PSSu XB F-T	◆	◆	Base station expansion module for ST/FS signals
PSSu XR F-T	◆	◆	Remote station expansion module for ST/FS signals

[1] These electronic modules cannot be combined with PSSu H FS SN SD or PSSu H FS SN SD-T.

Certification	Order number		
CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed	312435	-	-
CE, EAC (Eurasian), TÜV, cULus Listed	312420	-	-
CE, EAC (Eurasian), TÜV, cULus Listed	312421	-	-

Further information on the camera-based protection system PSENvip: Webcode: web150415

CE, cULus Listed	312480	314480	-
CE, cULus Listed	312485	314485	-
CE, TÜV, cULus Listed	312486	314486	-
CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed	312275	314275	-
CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed	312280	314280	-
CE, TÜV, cULus Listed	312433	-	-
CE, TÜV, cULus Listed	312434	314434	-
CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed	312437	-	-

CE, cULus Listed	312195	314195	312197
CE, cULus Listed	312196	314196	-
CE, TÜV, cULus Listed	312590	-	-
CE, TÜV, cULus Listed	312591	-	-
CE, TÜV, cULus Listed	312592	-	-

CE, cULus Listed	312515	314515	-
CE, cULus Listed	312516	314516	-
CE, cULus Listed	312438	-	-

CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed	-	314092	-
CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed	-	314093	-

Extended temperature range

Expanded diagnostic functions in the automation sector

Keep up-to-date on PSSuniversal I/O modules:

Webcode: web150421

Online information at www.pilz.com

Selection guide for infrastructure components

Unmanaged switches PSSnet SLL

Type	Technical features	Certification	Order number
PSSnet SLL 5T	5 electrical ports	CE, cULus Listed	380600
PSSnet SLL 4T 1FMMSC	4 electric ports, 1 fibre-optic port, multimode port	CE, cULus Listed	380604

Common features

- Plug and play (no configuration necessary)
- Diagnostic LEDs
- Can be used for industrial Ethernet systems such as SafetyNET p, PROFINET RT, EtherNET™, Modbus TCP

SafetyNET p connector, cable, stripping tool

SafetyNET p Connector RJ45s	Standard connector for IP20 installation, quick connection, RJ45 mating face, housing form compatible with PSSuniversal stabilising collar, ambient temperature: -40 °C … +70 °C	none	380400
SafetyNET p Cable	Cable (by the metre), cable cross-section AWG 22, CAT 5e, four-core	none	380000
SN CAB RJ45s RJ45s, 0.5m	0.5 m cable with 2 x RJ45 connector	none	380001
SN CAB RJ45s RJ45s, 1m	1 m cable with 2 x RJ45 connector	none	380003
SN CAB RJ45s RJ45s, 2m	2 m cable with 2 x RJ45 connector	none	380005
SN CAB RJ45s RJ45s, 5m	5 m cable with 2 x RJ45 connector	none	380007
SN CAB RJ45s RJ45s, 10m	10 m cable with 2 x RJ45 connector	none	380009
Stripping Tool	Installation tool for SafetyNET p Cable and Connector	none	380070

Gateways

PSSnet GW1 MOD-CAN	Protocol converter from Modbus/TCP Slave to CANopen Slave	CE, cULus Listed	311602
PSSnet GW1 MOD-EtherCAT	Protocol converter from Modbus/TCP Slave to EtherCat Slave	CE, cULus Listed	311601

Selection guide for PMI® and software

Operator terminals PMI

PMI v812

Type	Features	Certification	Order number
PMI v704e	▸ 4.3" TFT touchscreen ▸ Resolution 480 x 272 ▸ Linux ▸ 1 x USB	CE, EAC (Eurasian), cULus Listed	266704
PMI v707e	▸ 7" TFT touchscreen ▸ Resolution 800 x 480 ▸ Linux ▸ 1 x USB	CE, EAC (Eurasian), cULus Listed	266707
PMI v807	▸ 7" TFT touchscreen ▸ Resolution 840 x 480 ▸ Windows 10 IoT ▸ 2 x GbE, 1 x HMDI, 3 x USB	CE, EAC (Eurasian), cULus Listed	266807
PMI v812	▸ 12.1" TFT touchscreen ▸ Resolution 1 280 x 800 ▸ Windows 10 IoT ▸ 2 x GbE, 1 x HMDI, 3 x USB	CE, EAC (Eurasian), cULus Listed	266812

Visualisation software PASvisu

Type	Features	Order number
PASvisu Web-based visualisation software	▸ Consisting of the configuration tool PASvisu Builder and PASvisu Runtime ▸ A wide range of predefined GUI elements (tiles) ▸ Sophisticated visualisation thanks to the most diverse style sheets ▸ Optimum link between control project (PAS4000) and visualisation (PASvisu) ▸ A convenient overview both on a local basis and by remote access	Download software on the Internet by visiting www.pilz.com/pasvisu

Software in the automation system PSS 4000

Type	Features	Order number
PAS4000 Software platform in the automation system PSS 4000	▸ Editors PAS STL (Structured Text), PAS IL (Instruction List), PAS LD (Ladder Diagram) and SFC (Sequential Function Chart) in accordance with EN IEC 61131-3 ▸ Graphics program editor PASmulti ▸ Online help ▸ Special licence model	Download software on the Internet by visiting www.pilz.com/pas4000 PASunits: Once enabled for production operation, the project is licensed in PAS4000, PASunits are calculated for the functions used and credited to the project from the software's points account ▸ PASunits 500 ____ 317910 ▸ PASunits 1000 ____ 317920 ▸ PASunits 5000 ____ 317930 ▸ PASunits 10000 ____ 317940 ▸ PASkey: USB crypto memory for secure storage and transfer of PASunits ____ 317999

Selection guide for software blocks

General failsafe control blocks

Type	Function
FS_EmergencyStop	Configures and monitors the function of E-STOP pushbuttons with one or two N/C contacts.
FS_LightCurtain	Monitors the function of light curtains with two N/C contacts.
FS_SafetyGate	Monitors the function of safety gate switches with up to three contacts.
FS_Operating ModeSelectorSwitch	Monitors up to eight positions on an operating mode selector switch. Unneeded inputs may remain unassigned. Once the switchover time has elapsed, only one contact at a time may be closed.
FS_SafetyValve	Monitors the operation of safety valves of the single, double and directional type.
FS_TwoHandControl	Monitors whether the two pushbuttons on the two-hand control are operated simultaneously (within 0.5 s). In accordance with EN 574, two-hand pushbuttons of type IIIA (two N/O contacts) or type IIIC (combination of two N/O and two N/C contacts) can be used.
FS_Muting	Used to temporarily suspend safety functions (ESPE/AOPD) without interrupting the process (muting), in accordance with EN 61496-1.
FS_SafeEthernetConnection	Used for safe communication based on Industrial Ethernet. The underlying protocol is Modbus/TCP. A point-to-point connection (1:1 communication relationship) can be implemented as a result. The following are used as communication partners: PSSuniversal PLC with PNOZmulti (base units PNOZ mxp ETH).

Hardware-related blocks

FS_CounterDual	Used in conjunction with the blocks FS_AbsoluteEncoder and/or FS_IncrementalEncoder to calculate the following safe values: Position, speed and standstill.
FS_AbsoluteEncoder	Calculates a counter status (in increments) from the measured value from the absolute encoder and monitors the module status.
FS_IncrementalEncoder	Initialises the counter, calculates the current counter status (in increments) and transmits status information.
FS_AnalogueInput Dual	Monitors redundant, analogue input values for upward violation of a value range, downward violation of a value range and upward violation of a difference between the analogue input value 0 and analogue input value 1 over a defined period of time (plausibility check).
FS_Scaling	Scales an analogue input value and sends it to an O-variable.

Application-related blocks

FS_PressOperatingModes	Controls and monitors the setup, single stroke and automatic operating modes of a mechanical press.
FS_CamEvaluation	Monitors the mechanical rotary cam arrangement of a press for plausibility of the signals from the overrun cam and run-up cam, failure of the dynamic cam and overrun cam, upward violation of the overrun at top dead centre.
FS_CycleModeLightCurtain	Enables the cycle mode (control) for triggering the press stroke when using a light curtain in the standard and Sweden operating modes.
FS_CamController	Provides the position signals for a press control. It uses the angle values, from the block FS_PositionToAngle for example, to identify the signal for achieving top dead centre and so enables the shutdown of the press. It is used in the safe, electronic rotary cam arrangement.
FS_BurnerManagementSystem	Fully controls the burner cycle, including pre-purge, tightness control, ignition, afterburn, post-purge, etc.; depending on the setting, function monitoring based on the relevant step, continuous monitoring of the safety chains.

Standard-based control blocks

AND	AND is a basic logic operation that functions according to the principle below: If two conditions apply, the result is true.
OR	OR is a basic logic operation that functions according to the principle below: If one or other of the conditions applies, the result is true.
FlipFlop	Saves the state of the input signal until it is reset.
Timer	Generates an output signal for a set time after the start.

The PAS4000 software blocks can be found directly within the tool in the software library.
Tool download: www.pilz.com/pas4000

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Contact

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
Unit 1, 12-14 Miles Street
Mulgrave
Victoria 3170
Australia
Telephone: +61 3 95600621
Telefax: +61 3 95749035
E-Mail: safety@pilz.com.au
Internet: www.pilz.com.au

BE, LU
Pilz Belgium
Safe Automation
Poortakkerstraat 37/0201
9051 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
R. Joaquim Pupo, 443
Distrito Industrial João Narezzi
Indaiatuba – SP
13347-437
Brazil
Telephone: +55 11 4126-7290
Telefax: +55 11 4942-7002
E-Mail: pilz@pilz.com.br
Internet: www.pilz.com.br

CA
Pilz Automation Safety Canada L.P.
6695 Millcreek Drive
Mississauga, ON
L5N 5M4
Canada
Telephone: +1 905 821 7459
Telefax: +1 905 821 7459
E-Mail: info@pilz.ca
Internet: www.pilz.ca

CH
Pilz Industrieelektronik GmbH
Gewerbepark Hintermättli
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.
Rm. 1702-1704
Yongda International Tower
No. 2277 Long Yang Road
Shanghai 201204
China
Telephone: +86 21 60880878
Telefax: +86 21 60880870
E-Mail: sales@pilz.com.cn
Internet: www.pilz.com.cn

CZ
Pilz Czech s.r.o
Safe Automation
Zelený pruh 95/97
140 00 Praha 4
Czech Republic
Telephone: +420 222 135353
Telefax: +420 296 374788
E-Mail: info@pilz.cz
Internet: www.pilz.cz

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

DK
Pilz Skandinavien K/S
Safe Automation
Ellegaardvej 25 D
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
Elannontie 5
01510 Vantaa
Finland
Telephone: +358 10 3224030
Telefax: +358 9 27093709
E-Mail: pilz.fi@pilz.dk
Internet: www.pilz.fi

FR
Pilz France Electronic
21 Rue de la Haye
Espace Européen de l'Entreprise
Bâtiment ALTIS
67300 Schiltigheim
France
Telephone Sales Department:
+33 3 88104001
Telephone Order Processing:
+33 3 88104002
Telefax: +33 3 88108000
E-Mail: siege@pilz-france.fr
Internet: www.pilz.fr

GB
Pilz Automation Ltd
Pilz House
Little Colliers Field
Corby, Northants
NN18 8TJ
United Kingdom
Telephone: +44 1536 460766
Telefax: +44 1536 460866
E-Mail: sales@pilz.co.uk
Internet: www.pilz.co.uk

ID
Pilz South East Asia Pte. Ltd.
25 International Business Park
#04-56 German Centre
Singapore 609916
Singapore
Telephone: +65 6839 292-0
Telefax: +65 6839 292-1
E-Mail: sales@pilz.sg
Internet: www.pilz.sg

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

IN
Pilz India Pvt. Ltd
6th Floor, 'Cybernex'
Shankar Sheth Road, Swargate
Pune 411042
India
Telephone: +91 20 49221100/-1/-2
Telefax: +91 20 49221103
E-Mail: info@pilz.in
Internet: www.pilz.in

IT, MT
Pilz Italia S.r.l.
Automazione sicura
Via Gran Sasso n. 1
20823 Lentate sul Seveso (MB)
Italy
Telephone: +39 0362 1826711
Telefax: +39 0362 1826755
E-Mail: info@pilz.it
Internet: www.pilz.it

JP
Pilz Japan Co., Ltd.
Safe Automation
Ichigo Shin-Yokohama Bldg. 4F
3-17-5 Shin-Yokohama
Kohoku-ku
222-0033 Yokohama
Japan
Telephone: +81 45 471-2281
Telefax: +81 45 471-2283
E-Mail: pilz@pilz.co.jp
Internet: www.pilz.jp

KH
Pilz South East Asia Pte. Ltd.
25 International Business Park
#04-56 German Centre
Singapore 609916
Singapore
Telephone: +65 6839 292-0
Telefax: +65 6839 292-1
E-Mail: sales@pilz.sg
Internet: www.pilz.sg

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

KR
Pilz Korea Ltd.
Safe Automation
4FL, Elentec bldg.,
17 Pangyoro-228 Bundang-gu
Seongnam-si
Gyunggi-do
South Korea 13487
Telephone: +82 31 778 3300
Telefax: +82 31 778 3399
E-Mail: info@pilzkorea.co.kr
Internet: www.pilz.co.kr

LA
Pilz South East Asia Pte. Ltd.
25 International Business Park
#04-56 German Centre
Singapore 609916
Singapore
Telephone: +65 6839 292-0
Telefax: +65 6839 292-1
E-Mail: sales@pilz.sg
Internet: www.pilz.sg

MX
Pilz de México, S. de R.L. de C.V.
Automatización Segura
Convento de Actopan 36
Jardines de Santa Mónica
Tlalnepantla, Méx. 54050
Mexico
Telephone: +52 55 5572 1300
Telefax: +52 55 5572 1300
E-Mail: info@pilz.com.mx
Internet: www.pilz.mx

MY
Pilz South East Asia Pte. Ltd.
25 International Business Park
#04-56 German Centre
Singapore 609916
Singapore
Telephone: +65 6839 292-0
Telefax: +65 6839 292-1
E-Mail: sales@pilz.sg
Internet: www.pilz.sg

NL
Pilz Nederland
Veilige automatisering
Havenweg 22
4131 NM Vianen
Netherlands
Telephone: +31 347 320477
Telefax: +31 347 320485
E-Mail: info@pilz.nl
Internet: www.pilz.nl

NZ
Pilz New Zealand
Safe Automation
Unit 4, 12 Laidlaw Way
East Tamaki
Auckland 2016
New Zealand
Telephone: +64 9 6345350
Telefax: +64 9 6345352
E-Mail: office@pilz.co.nz
Internet: www.pilz.co.nz

PH
Pilz South East Asia Pte. Ltd.
25 International Business Park
#04-56 German Centre
Singapore 609916
Singapore
Telephone: +65 6839 292-0
Telefax: +65 6839 292-1
E-Mail: sales@pilz.sg
Internet: www.pilz.sg

PL, BY, UA
Pilz Polska Sp. z o.o.
Safe Automation
ul. Ruchliwa 15
02-182 Warszawa
Poland
Telephone: +48 22 8847100
Telefax: +48 22 8847109
E-Mail: info@pilz.pl
Internet: www.pilz.pl

PT
Pilz Industrieelektronik S.L.
Edifício Tower Plaza
Rotunda Eng. Egdar Cardoso
Nº 23, 5º - Sala E
4400-676 Vila Nova de Gaia
Portugal
Telephone: +351 229407594
E-Mail: info@pilz.pt
Internet: www.pilz.pt

RU
Pilz RUS OOO
Ugreshskaya street, 2,
bldg. 11, office 16 (1st floor)
115088 Moskau
Russian Federation
Telephone: +7 495 665 4993
E-Mail: pilz@pilzrussia.ru
Internet: www.pilzrussia.ru

SE
Pilz Skandinavien K/S
Safe Automation
Smörhålevägen 3
43442 Kungsbacka
Sweden
Telephone: +46 300 13990
Telefax: +46 300 30740
E-Mail: pilz.se@pilz.dk
Internet: www.pilz.se

SG
Pilz South East Asia Pte. Ltd.
25 International Business Park
#04-56 German Centre
Singapore 609916
Singapore
Telephone: +65 6839 292-0
Telefax: +65 6839 292-1
E-Mail: sales@pilz.sg
Internet: www.pilz.sg

SK
Pilz Slovakia s.r.o.
Štúrova 101
05921 Svit
Slovakia
Telephone: +421 52 7152601
E-Mail: info@pilzslovakia.sk
Internet: www.pilzslovakia.sk

TH
Pilz South East Asia Pte. Ltd.
25 International Business Park
#04-56 German Centre
Singapore 609916
Singapore
Telephone: +65 6839 292-0
Telefax: +65 6839 292-1
E-Mail: sales@pilz.sg
Internet: www.pilz.sg

TR
Pilz Emniyet Otomasyon
Ürünleri ve Hizmetleri Tic. Ltd. Şti.
Kayışdağı Mahallesi Dudullu Yolu Cad.
Mecnun Sok. Duru Plaza No:7
34755 Ataşehir/İstanbul
Turkey
Telephone: +90 216 5775550
Telefax: +90 216 5775549
E-Mail: info@pilz.com.tr
Internet: www.pilz.com.tr

TW
Pilz Taiwan Ltd.
10F., No. 36, Sec. 3, Bade Rd.
Songshan Dist., Taipei City 105
Taiwan (R.O.C.)
Telephone: +886 2 2570 0068
Telefax: +886 2 2570 0078
E-Mail: info@pilz.tw
Internet: www.pilz.tw

US
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

VN
Pilz South East Asia Pte. Ltd.
25 International Business Park
#04-56 German Centre
Singapore 609916
Singapore
Telephone: +65 6839 292-0
Telefax: +65 6839 292-1
E-Mail: sales@pilz.sg
Internet: www.pilz.sg

Support

Technical support is available from Pilz round the clock.

Americas
Brazil
+55 11 97569-2804
Canada
+1 888 315 7459
Mexico
+52 55 5572 1300
USA (toll-free)
+1 877-PILZUSA (745-9872)

Asia
China
+86 21 60880878-216
Japan
+81 45 471-2281
South Korea
+82 31 778 3300

Australia and Oceania
Australia
+61 3 95600621
New Zealand
+64 9 6345350

Europe
Austria
+43 1 7986263-0
Belgium, Luxembourg
+32 9 3217570
France
+33 3 88104003
Germany
+49 711 3409-444
Ireland
+353 21 4804983
Italy, Malta
+39 0362 1826711
Scandinavia
+45 74436332
Spain
+34 938497433
Switzerland
+41 62 88979-32
The Netherlands
+31 347 320477
Turkey
+90 216 5775552
United Kingdom
+44 1536 462203

You can reach our international hotline on:
+49 711 3409-222
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