

### Automation technology Components – Systems – Services



#### Product overview

- ▶ Sensor technology ▶ Relays ▶ Small controllers
- ▶ Controllers ▶ Drive technology
- Operating and monitoring Software Services





# We automate. Safely.





#### Leading in automation technology

Pilz's components, systems and services protect man, machine and the environment. Its automation solutions are based on knowledge and experience gathered over decades of involvement in automation technology. Its extensive knowledge of standards and regulations is supplemented by its involvement in national and international boards. This enables Pilz to play an active role in shaping the future of industrial automation. Today, Pilz products and systems are in use worldwide and range from sensor or control technology to drive technology.

#### Benefit-oriented innovations

Close relations with the customer are the basis of Pilz's innovativeness. The latest market requirements as well as customer preferences are fed directly into the development process.

Thanks to many years of experience in the most diverse industrial sectors, Pilz places the focus on safe, high availability of plant and machinery. It is the only way we can guarantee the personal safety of employees and meet the needs of the customer. Ultimately, it will also lead to the desired economic success.

Rising to these challenges takes time, specific expertise and the relevant capacity. Pilz responds by offering a comprehensive range of services for machinery safety.



Pilz is your solution supplier for all automation tasks. Including standard control functions. Pilz developments protect man, machine and the environment. 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 42 subsidiaries and branches, as well as 27 sales partners on every continent. More than 2 200 staff, each one of them an ambassador for safety, make sure that your staff – your company's most valuable asset – can work safely and free from injury.

### SERVICES

Consulting Engineering Training

### Economical









Automation solutions from Pilz – at home in every industry.

## Services: Consulting, engineering and training

As a solution supplier, Pilz can help you in the global application of optimum safety strategies that comply with specifications. Our services ensure the highest safety for man and machine worldwide.





Training

Pilz supports you with a comprehensive range of training courses on all topics of machinery safety and automation.



And to progress to the expert level in machinery safety we offer the qualification of CMSE<sup>®</sup> – Certified Machinery Safety Expert.



Machinery safety

#### **Risk Assessment**

We review your machinery in accordance with the applicable standards and directives and assess the existing hazards.

#### Safety Concept

We develop detailed technical solutions for the safety of your plant and machinery through mechanical, electronic and organisational measures.

#### Safety Design

The aim of the safety design is to reduce or eliminate danger points through detailed planning of the necessary protective measures.

#### System Implementation

The results of the risk analysis and safety design are implemented to suit the particular requirements through selected safety measures.

#### Validation

In the validation, the risk assessment and safety concept are mirrored and inspected by competent, specialist staff.

And we perform collision measurement for human-robot applications in accordance with the limit values from ISO/TS 15066.



International compliance

#### CE Marking

We control all activities and processes for the necessary conformity assessment procedure, including the technical documentation that is required.

#### NR-12

As a complete supplier we can provide support from risk assessment to validation, technical documentation at the manufacturer's and final acceptance at the operator's in Brazil.



Workplace safety

#### Plant Assessment

We will prepare an overview of your entire plant in the shortest possible time. With an on-site inspection we will expose risks and calculate the cost of optimising your safeguards.

#### Lockout Tagout System

Our customised lockout tagout (LoTo) measures guarantee that staff can safely control potentially hazardous energies during maintenance and repair.

#### Inspection of Safeguarding Devices

With our independent, ISO 17020-compliant inspection body, which is accredited by the German Accreditation Body (DAkkS), we can guarantee objectivity and high availability of your machines.



Pilz GmbH & Co. KG, Ostfildern, operates an inspection body for plant and machinery, accredited by DAkkS. Services for Safety and Automation:



Online information at www.pilz.com

## Safe sensor technology

Reach the right product with just one click – the Pilz product finder:

#### Webcode: web150521

Online information at www.pilz.com

Pilz sensors PSEN guarantee that complex plants and machinery can be used efficiently while still complying with standards intended to protect man and machine. The versatile portfolio provides individual solutions for every requirement: from position monitoring to three-dimensional zone monitoring.



#### Free choice for your application

Overall solutions and complete systems, including in conjunction with safe control technology, offer ample potential for savings with your automation solution. And there are no limits. Whether we are talking about a small machine or a complex system, Pilz sensor technology will slot perfectly into your system environment. Thanks to its compatibility and suitability for connection in series with other sensors, you always obtain an economical solution.

While high plant efficiency is a requirement in an industrial environment, it's important not to neglect the protection of man, machine and the environment: from commissioning to high availability during operation. Pilz sensors PSEN provide a safe, flexible solution.

#### Your benefits at a glance Economical solutions:

- Sensors from the various product ranges are compatible and can be connected in series
- Investment protection: Incorporated optimally into the system environment, easy to retrofit
- Potential saving: In the project planning, design, documentation, procurement and assembly stages thanks to ready-to-install systems and comprehensive solutions



### Safety switch PSENmag and PSENcode

 different designs and operating principles: magnetic and coded safety switches offer economical series connection and a very high standard of manipulation protection (PSENcode).



### Safety switch PSENmech and safety bolt PSENbolt

the mechanical alternative for safety gate monitoring for personnel and processes.
The safety bolt represents a complete solution of a safety switch, handle and bolt.



Safety gate systems

and PSENsgate

PSENslock, PSENmlock

- all the safety functions for

the smallest possible space:

safe position monitoring and safe

guard locking in a single system -

monitoring safety gates in

mechanical or magnetic.

The safe complete solution: sensor technology plus controller

Comprehensive range of accessories available in our E-Shop.

Webcode web150413, web150412

Webcode web150414, web150411

Webcode web150524



#### Optoelectronic sensors PSENopt and PSENscan

- the light curtains PSENopt offer finger, hand and body protection, along with extended functionalities such as muting, blanking and cascading. The safety laser scanners PSENscan are suitable for 2D area monitoring.



SafetyEYE and PSENvip

#### Safe camera systems SafetyEYE and PSENvip

 use SafetyEYE for 3D zone monitoring and the camera-based protection system PSENvip for monitoring and controlling press brakes.



#### Safety Device Diagnostics

 use Safety Device Diagnostics to access advanced diagnostic data from Pilz safety devices.
 Thanks to the use of SDD, service deployments are avoided and downtimes reduced.

Webcode web150525

Webcode web150526

Webcode web150456



Reach the right product with just one click – the Pilz product finder:

#### Webcode: web150079

Online information at www.pilz.com

The aim of Pilz relays is to keep the risk to man and machine as low as possible. The relays mean you have the right solution for every application, with an ideal cost/performance ratio that has been proven in the market millions of times over. Choose one of the leading brands in automation technology – a brand with many years of experience and outstanding service.



For reliable monitoring of functional safety, we offer you the safety relays PNOZ. Monitor electrical safety with the electronic monitoring relays PMD. For safe line inspection we offer you PLIDdys. Brake control devices are used to monitor safety brakes or holding brakes. Devices for safe speed monitoring complete the range of innovative relays. Our products comply with international standards and regulations. Reliable devices guarantee you highly economical operation as well as a long service life for machinery and plant – see for yourself!

#### Your benefits at a glance

- The reassurance of a leading brand
- Optimum cost/ performance ratio
- Rapid instrument-based commissioning
- High availability of products
- Certified safety, because international standards and regulations are met



#### Safety relay PNOZ

- for monitoring machinery with up to three safety functions (e.g. E-STOP, safety gates etc., ...). There are different product ranges depending on the requirement.



PMDsigma

### Electronic monitoring relays PMD

for monitoring electrical variables such as voltage or true power.



### Line inspection devices PLIDdys

 provide safe power-up on two-wire connections, for maximum safety on long cable routes.

Webcode web150902

Comprehensive range of accessories available in our E-Shop.

Relays from Pilz -

the optimum safety solution

#### Webcode web150093

Webcode web150105



PNOZ s50

#### Brake control devices PNOZ s50

 suitable for safe brake control and monitoring of holding brakes or safety brakes.



### Speed monitoring devices PNOZ s30

 suitable for safe monitoring of standstill, position and direction as well as monitoring of speed range and shear pin breakage.

Webcode web150117

Webcode web150619

## Configurable, safe small controllers

Reach the right product with just one click – the Pilz product finder:

#### Webcode: web150495

Online information at www.pilz.com Safe small controllers bridge the gap between classic safety relays and large programmable control systems. Use the configurable small controllers PNOZmulti to implement multiple safety functions. Functional safety to protect man and machine is thus achievable both simply and flexibly, with just a few clicks in the software tool PNOZmulti Configurator. On small machines, the small controllers PNOZmulti also perform automation tasks. Easy diagnostics and visualisation are possible with the web-based visualisation software PASvisu – for high plant availability and low downtimes.



#### Many functions - one solution

The software tool PNOZmulti Configurator will impress you with its simple operation: install, open, work intuitively. The wide range of fieldbus and communications options is a big plus with PNOZmulti, because the safety system can be used independently of the higher-level operational control. PNOZmulti is the worldwide standard for many automation environments and communication systems. A wide selection of expansion modules ensures maximum flexibility and safety for your application. Input and output modules, motion monitoring modules and link modules are available.

- Your benefits at a glance
- Cost-effective and long-lasting: worldwide safety standard for many automation environments and communication systems
- Flexible: configuration using certified software blocks, simple adjustment and adaptation







PNOZ m B0

### Configurable, safe small controllers PNOZmulti 2

 PNOZmulti 2 gives you all the advantages of the latest generation. The full function range of the "classic" PNOZmulti base units has been made available in an overall width of 45 mm, complete with an illuminated display and modular expansion.



### Configurable, safe small controllers PNOZmulti

 PNOZmulti is the classic safety system. The system is characterised by a diverse range of base units, expansion modules and communication options. PNOZ mm0.1p

### Configurable, safe compact controllers PNOZmulti Mini

PNOZmulti Mini gives you
 four base units to choose from,
 plus a small number of expansion
 modules. Additional output
 contacts are possible using the
 contact expansion modules from
 the product group PNOZsigma.

PNOZmulti – many functions, one solution!

Small controllers

Comprehensive range of accessories available in our E-Shop.

#### Webcode web150500



PNOZmulti Configurator

#### Software tool PNOZmulti Configurator

 the graphic tool helps with configuring and parameter setting for the safe small controllers PNOZmulti including documentation and commissioning.



Webcode web150497

#### Visualisation software PASvisu

 optimally linked: Control project and visualisation. The web-based visualisation software PASvisu enables simple configuration and visualisation.



Webcode web150501

#### **Decentralised modules PDP**

 to assist you with economically decentralising your application.
 Integrated in dirt and water-repellent housings.

Webcode web150399

Webcode web150430

Webcode web150510

### Controllers

Reach the right product with just one click – the Pilz product finder:

Webcode: web150509

Online information at www.pilz.com

You can use controllers and decentralised I/O systems from Pilz to easily and flexibly implement safety and automation applications of any size: machines with an elementary function range, machines with multiple axes, interlinked plant and machinery. High availability and productivity, as well as maximum safety, are thus guaranteed for your plant and machinery.



#### Simple programming of large plants!

- Processing of safety and automation functions
- Can be used as a stand-alone controller or as part of a network
- Intuitive programming of complex functions
- High level of flexibility thanks to modular system structure
- Extensive selection of modules to meet your specific requirements

#### System for third-party controllers

- Communication with the controller takes place via common fieldbus protocols
- Functions for safety and automation are processed decentrally at field level
- Quick commissioning and easy configuration thanks to the independent periphery test
- High level of flexibility thanks to modular system structure

#### Your benefits at a glance

- High flexibility: The appropriate solution for each application
- High plant availability: low downtimes for your plant or machinery thanks to convenient diagnostics
- Faster commissioning:
   e.g. thanks to units with plug-in terminals or simple software solutions



PSSuniversal PLC

### Control and I/O systems of the automation system PSS 4000

 the automation system
 PSS 4000 is scalable and can be used industry-wide thanks to the various controllers and
 I/O systems, coupled with the configuration and programming software.



#### PSSuniversal decentralised I/O systems

 the decentralised I/O systems
 PSSuniversal can be tailored for use as remote I/Os at field level.
 Connection to a higher-level thirdparty controller is via common industrial communication
 protocols.



- the remote I/O system permits

customised, granular solutions.

It consists of communication

modules with PROFINET and

EtherNet/IP interfaces and a

selection of I/O modules.

Webcode web150509

**PSSuniversal 2** 

remote I/O system

#### Pilz control technology – for safety and automation

Comprehensive range of accessories available in our E-Shop.

#### Webcode web151340

Webcode web150509





#### Software platform PAS4000

 contains several editors and blocks. The tools for configuration, programming, commissioning and operation are closely compatible.



#### Visualisation software PASvisu

 for control projects and visualisation. The web-based visualisation software PASvisu enables simple configuration and visualisation. You can link your PAS4000 control project directly to the PASvisu Builder project.



#### PSS67 modules

the modules with protection
 type IP67 (water and dust
 resistant) can be used decentrally
 in the field. With a connection
 to SafetyNET p, they can be
 integrated into the automation
 system PSS 4000.

Webcode web150503

Webcode web181447

## Drive technology

Reach the right product with just one click – the Pilz product finder:

Webcode: web150506

Online information at www.pilz.com

Pilz Motion Control provides overall and energy-efficient solutions for your machine automation. The portfolio spans complete solutions from motion control systems and servo amplifiers to servo motors, including all safety aspects. Individual components are also available to you. Pilz drive technology is embedded into the relevant system environment – whether a new structure or a retrofit – and is open for a variety of interfaces and functionalities.



#### Capable all-rounder

Drive technology PMC is available to you for a wide range of applications: The safe motion solution is suitable for servo presses, for example. Functions such as "Safely Limited Speed" in set-up mode, "Safe Direction" during the light curtain's muting phase and "Safe Brake Control" on vertical axes enable operators to work safely within the danger zone.

Intelligent motion control enables you to reap the rewards of short cycle times and optimally synchronised motion sequences. The intuitively operated software PMCtools supports you with simple parameter setting and diagnostics.

#### Your benefits at a glance

- Safe: up to PL e for each piece of feedback
- Energy efficient: high energy savings thanks to efficient servo technology
- Open: highly flexible because various fieldbus and feedback systems and functionalities can be used
- Productive: short cycle times pave the way for high performance, e.g. by drive bus EtherCAT



PMCprimo DriveP

#### **Control systems PMCprimo** - they are based on PLC and motion technology and are suitable for use in control and motion tasks.



PMCtendo DD5 PMCprotego D

#### Servo amplifiers PMCtendo DD5 and PMCprotego D

- these are used as drive controllers for a very wide range of motor technologies: from the servomotor to the asynchronous and linear motor.



Servomotors PMCtendo SZ

- you will find the most suitable motor for your requirements here, depending on the priorities: dimensions, dynamics, controllability, connection variants or feedback systems.

Webcode web150528

Comprehensive range of accessories available in our E-Shop.

Pilz drive technology safe, energy efficient, open,

productive

Webcode web150507

Webcode web150508



PMCprotego DS

#### Safe motion

- this consists of a combination of safety card PMCprotego S and servo amplifier PMCprotego D. Safe functions keep setup times down, minimise maintenance costs and increase productivity.





Safe Stop 1 (SS1)



Safe Stop 2 (SS2)









Safely Limited Speed (SLS)

Safe Operating Stop (SOS)



Safely Limited Position (SLP)

Safe Direction (SDI)



Safely Limited Increment (SLI)



Safe Brake Control (SBC)



Safe Brake Test (SBT)



Safe Speed Range (SSR)

## Operating and monitoring

Reach the right product with just one click - the Pilz product finder:

Webcode:

Operating and monitoring enable short reaction times through control and signal devices, as well as rapid diagnostics via visualisation systems. As the ideal supplement for other Pilz products, your plant is completed reliably and in compliance with the standards.



#### Control and signal devices PIT - safe all round

Selection of the correct control and signal devices is a key factor for the safety of man and machine. Rely on a safe solution with Pilz compliant emergency stop pushbuttons, muting lamps, and manually operated control devices and operating mode selector switches.

#### Operator terminals PMI - professional and simple

Systems for process visualisation and interaction between man and machine form the link between operator and machine. When an error occurs, diagnostics on the plant and machinery have a special role to play. Good visualisation and diagnostics also mean shorter downtimes and therefore increased cost effectiveness.

Your benefits at a glance

- Control and signal devices
  - Simple and quick mounting: with push-in technology - Increased operational

safety: thanks to contact block with monitoring

- Operator terminals - Flexible to use: variety of hardware and software, numerous
  - display sizes - Complete tools: for diagnostics, visualisation and control



#### E-STOP pushbutton PITestop

different versions,
e.g. illuminated or with key,
ensure the safety of man and
machine in emergency stop
equipment.



Muting lamps PITsign – indicate that electrosensitive protective equipment is also suspended in accordance with IEC 61496-1, even during muting.



Manually operated

operation).

Webcode web150437

control devices PITjog – are used if the effect of safety

equipment has to be completely

or partially suspended (two-hand

Professional operating and monitoring with Pilz

Comprehensive range of accessories available in our E-Shop.

Webcode web150441

Webcode web150436



#### Enabling switches PITenable

 are used as manually operated control devices for working with an open safety gate (one-handed operation).



#### Operating mode selector switches PITmode

 offer two functions: selection of operating mode and authorisation control for machine access.



#### Operator terminals PMI

 are equipped with a resistive touch display from 3.5" to 15" for operation and monitoring of technical processes.

Webcode web150440

Webcode web150439

Webcode web150778

### Software

#### Webcode: web150367

Online information at www.pilz.com

Design, programming, configuration and commissioning can be achieved quickly and simply using Pilz automation software. The easy, user-friendly diagnostics of our automation software guarantee a high level of plant availability. Product-independent tools for use in interactive products are also available to you.





Webcode: web150431

Online information

at www.pilz.com

#### Calculation software for verifying functional safety

The PAScal Safety Calculator calculates the PL (Performance Level) and SIL (Safety Integrity Level) achievable for safety functions on plant and machinery depending on the components used. The result is verified with the required PL in accordance with EN ISO 13849-1 or SIL in accordance with EN/IEC 62061 and any actions that are required are listed. PAScal supports the VDMA-66413 and Sistema library format. This guarantees that data is displayed in a standardised format across a range of manufacturers. PAScal® has been certified by TÜV SÜD.







Lockout/tagout documentation software PASIoto

Lockout tagout LoTo is concerned with enabling energy and safety-relevant interlocks on the various energy supplies on machines. The software PASloto provides support as you document your lockout tagout procedures. PASloto helps you to draw up job descriptions for powering down in the LoTo procedure. You can also document your whole plant simply and quickly with regard to LoTo. With this regulated procedure in the lockout tagout process you save time and money and, last but not least, guarantee higher occupational safety.





Online information at www.pilz.com









Online information at www.pilz.com

#### HMI software PASvisu for web-based visualisation - an overview of all your automation!

PASvisu enables you to perform easy configuration and optimum visualisation of your automation projects. 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.

## > As unique as your requirements: Pilz industry expe

Pilz offers unique industry know-how, built up over decades and still continuously expanded today, that virtually no other company in the world is able to match. Whatever industry you are in, we support you with our structured project management, safety expertise and know-how.



#### Robotics – human-robot collaboration. Safety guaranteed!

Pilz helps you to implement safe human-robot applications, using solutions that are tailored to the individual life phases of a robot system.



### Packaging technology – economical and flexible solutions

In practice it comes down to the harmonisation of safety and automation, particularly when the machine needs to be fitted or maintained. It's essential to have a safety concept for your packaging machines and to select the right safe sensors, controllers and drives, including the appropriate software for machine diagnostics and maintenance.



### Metalworking/presses – safety-related equipment, upgrade and operation of presses

Reliable safety technology for presses should not only be flexible and powerful, but economical too. We can help you to equip and retrofit your presses safely and guarantee safe operation. As an experienced partner we are there to support you throughout the redesign and retrofit, for the entire life cycle of the machine.

### rtise



### Automobile – safe solutions for the automotive industry

We guarantee the high availability and efficiency of your plants through integrated machinery safety. Our experts will advise you on each individual step of the production process. Whether pressing, body shell manufacturing, paint system or the assembly line. Pilz has extensive expertise in a wide range of applications. Talk to us about your individual solution.



### Rail and transport technology –

industrial safety technology to rail standards As a company that operates internationally as a technology leader, Pilz has many decades of experience in the field of safe automation. The highly sensitive and heavily safety-relevant railway sector benefits from precisely this experience thanks to the use of proven industrial automation products.



#### Wind power -

safe, efficient automation of wind turbines

Pilz offers solutions for monitoring all the relevant safety functions on wind turbines. Even on a wind turbine, the protection of man and machine is absolutely indispensable. We provide solutions for safe speed monitoring on the rotor and generator shaft, for example.



### Food & Beverage – machinery safety in the food & beverage industry

You need flexible systems in order to produce a wide range of products. That means you need a strong safety partner by your side. We support you in the integration of additional equipment or the upgrading of an existing machine taking all aspects of safety into account.



#### Pilz automation solutions

Pilz offers everything that you need for the automation of your plant and machinery: Innovative components and systems in which safety and automation are merged within hardware and software.

From sensor and control technology to drive technology, the ease of commissioning, operation and diagnostics plays an important role for all components and systems from Pilz. You benefit from flexible solutions for machines with an elementary function range through to large interlinked plants. With us you can standardise your safety, implement safety and automation in one periphery or find solutions for complete automation.

Pilz solutions are embedded into the relevant system environment – whether a new structure or a retrofit – and are open for a variety of interfaces and functionalities. The perfect combination:

#### Control technology from Pilz

offers numerous application options, including monitoring of electrical and functional safety, through to complete machine control.

Safe sensors and decentralised modules from Pilz guarantee the efficient, compliant use of plant and machinery in combination with various control systems.



### **Pilz automation solutions**

- Simple configuration, programming and visualisation through innovative software solutions
- > High flexibility due to individually expandable solutions
- Openness of communication
- High availability thanks to extensive diagnostic options
- One system for safety and automation

Our turnkey systems and universally compatible solutions offer a high savings potential.

THETY & AUTOMATIO

Drive technology from Pilz is characterised by drive-integrated safety functions, safe logic functions and the connection of visualisation, sensor and actuator technology.

Operator and visualisation systems from Pilz complete your plant and machinery.

#### Automation software from Pilz

allows you to quickly and easily implement your planning, programming, configuration, commissioning, diagnostics and visualisation.

Pilz offers you automation solutions for the safety of man, machine and the environment.

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