# PSS® Programmable Safety and Control Systems

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more than automation
safe automation

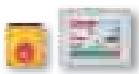
PSSmodular and PSScompact programmable safety and control systems,
PSSuniversal decentralised periphery, SafetyBUS p safe bus system

COMPLETE
Safety
&
Control
AUTOMATION

**One system for safety and standard.**

# Business activities

## Excellent Components

| | | |
|---|---|---|
| **Sensor technology** | ▸ Safety switches<br>▸ Safety bolts<br>▸ Optoelectronic protective devices<br>▸ Safe camera systems |  |
| **Control and communication** | ▸ Electronic monitoring relays<br>▸ Safety relays<br>▸ Programmable safety and control systems<br>▸ Industrial communication |  |
| **Motion Control** | ▸ Control systems<br>▸ Servo amplifiers<br>▸ Motors |  |
| **Operating and monitoring** | ▸ Control and signal devices<br>▸ Operator terminals |  |
| **Software** | ▸ System software<br>▸ User software<br>▸ Software tools |  |

## Professional Services

| | | |
|---|---|---|
| **Consulting** | ▸ Plant assessment<br>▸ Risk assessment<br>▸ Safety concept<br>▸ CE services<br>▸ Inspection of ESPE |  |
| **Engineering** | ▸ Safety design<br>▸ Safety sign-off |  |
| **Training** | ▸ Seminars<br>▸ Courses |  |

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# Support

**Technical help round the clock!**

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

**You can reach our international hotline on:**

**+49 711 3409-444**

The following worldwide telephone support numbers are also available:

**America**

- Brazil:
  +55 11 82458267
- USA (toll-free):
  1-877-PILZUSA (745-9872)

**Europe**

- Switzerland:
  +41 62 8897930
- Scandinavia:
  +45 74436332

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Sichere Automation
Felix-Wankel-Straße 2
73760 Ostfildern, Germany

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

# Why does Pilz offer more?

**Because the integrality of our business activities is what sets us apart.**


Pilz is a solution supplier for all automation functions. Including standard control functions. Developments from Pilz protect man, machine and the environment. That's why all our experience and knowledge goes into individual products as well as consistently sophisticated system solutions.

- Sensor technology
- Control and communication
- Motion Control
- Operating and monitoring
- Software
- Consulting
- Engineering
- Training

Appropriate services relating to individual components and independent generic services guarantee that our customers obtain customised automation solutions, all from one source.

**Pilz is a family business that's closer to its customers.**

Pilz has a tradition as a family-run company stretching back over 50 years.
Real proximity to customers is visible in all areas, instilling confidence through individual consultation, flexibility and reliable service.

We are your contact, guide and competency leader en route to an optimum automation solution.

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# As flexible as your plant is

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

For many years, Pilz PSS programmable safety and control systems have monitored and controlled the widest range of applications worldwide. The comprehensive portfolio allows you to be flexible in the combinations you choose and covers numerous application options.

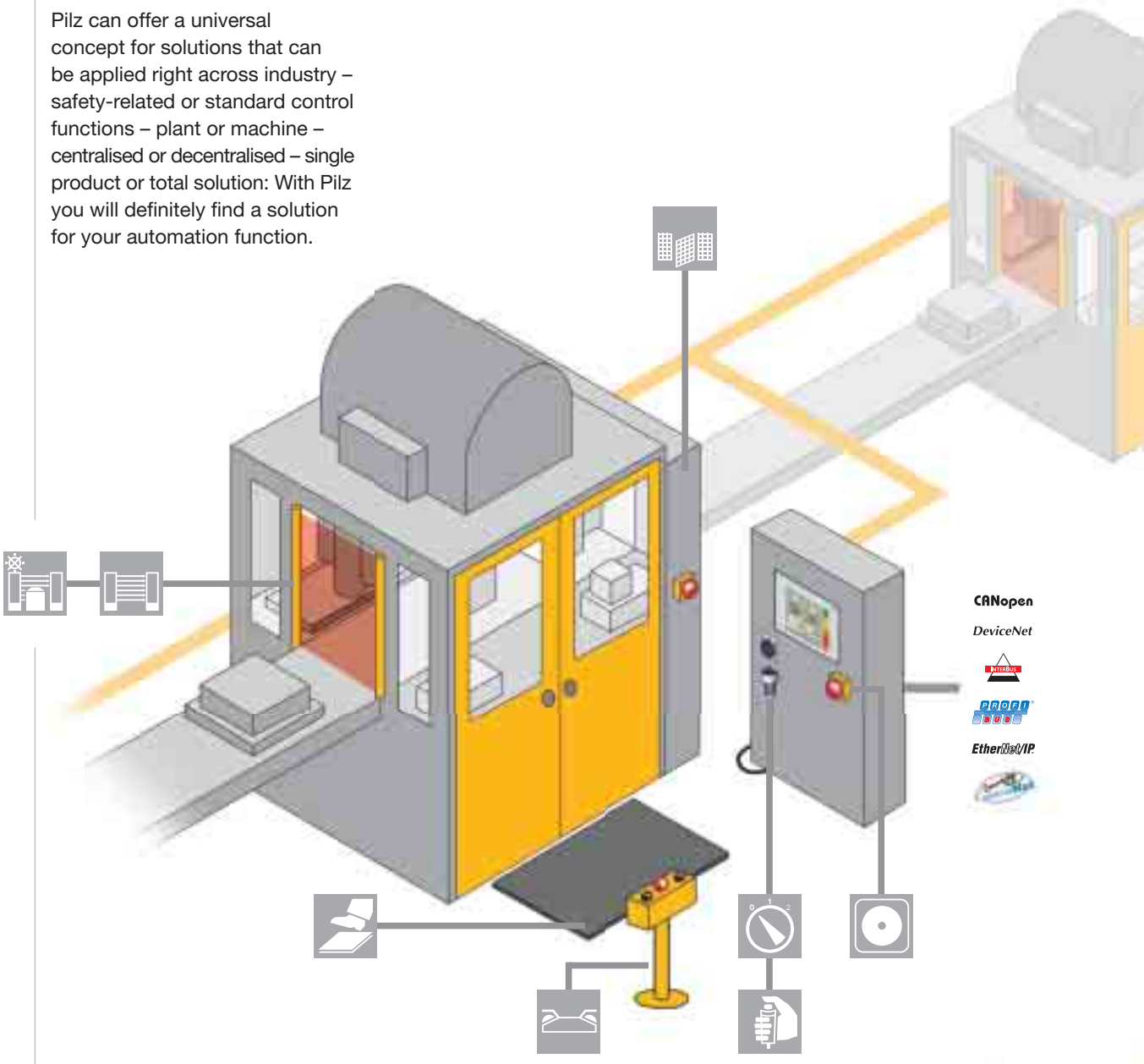
Innovation is our mission! PSS programmable safety and control systems undergo constant development in close contact with our customers. New technologies – such as the real-time Ethernet system SafetyNET p – open up new horizons in control technology. And with just one system for safety-related and standard control functions, you can implement your plant and machine control concepts at optimum cost.

**Contents**



# Solution supplier for safety and standard

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





*Sensor technology*

*Operating and monitoring*

*Electronic monitoring relays PMDsrange*

*Motion Control*

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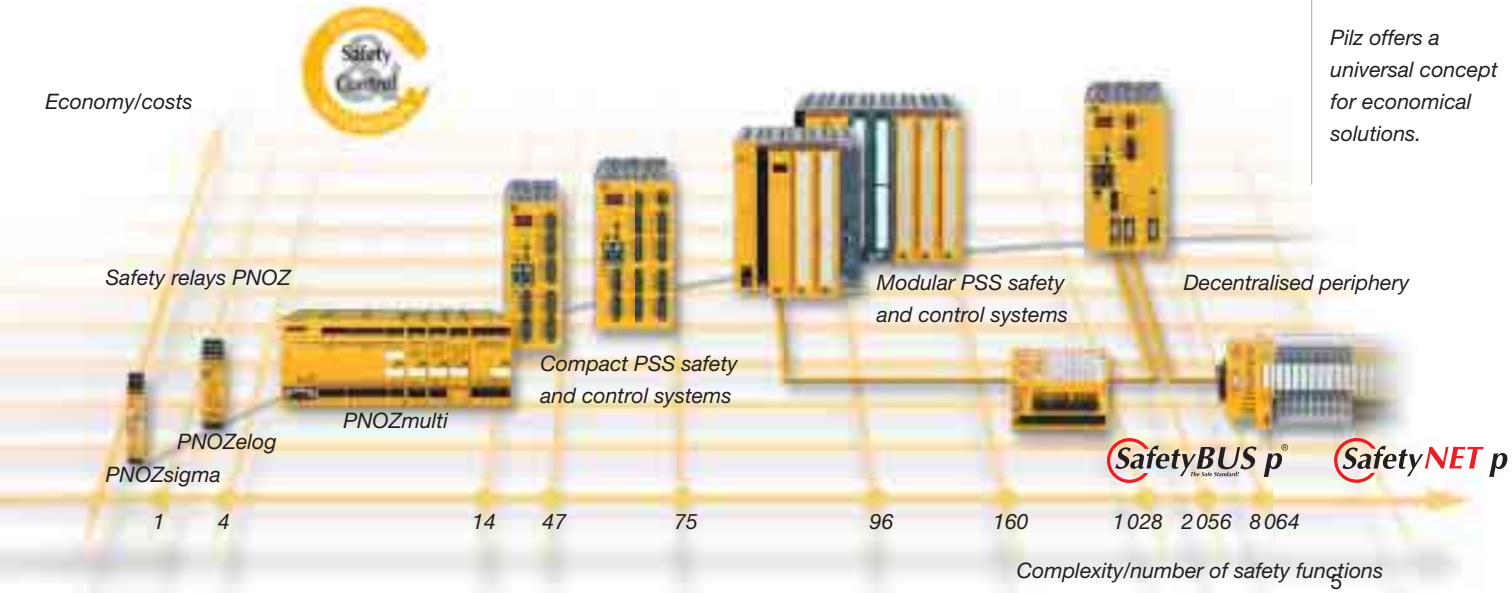
SafetyBUS p®

- For electrical safety such as voltage or true power monitoring, electronic PMDsrange monitoring relays provide the optimum solution.
- Pilz Motion Control (PMC) represents a flexible, modular and expandable automation system for complex motion and control functions. This automation system manages all the movements of a large number of physically separate servo axes within a plant.
- For monitoring E-STOPs, safety gates, light curtains/ light barriers, two-hand control and many other functions, we recommend Pilz safe control technology in terms of functional safety. Standard control functions are included.
  - For simple plant and machinery with up to 4 safety functions, use the safety relays PNOZ X, PNOZsigma and PNOZelog.
  - To cover 4 to 14 safety functions, the modular safety system PNOZmulti is the most economical solution.
  - On complex machinery or distributed plants, PSS programmable safety and control systems can be used with decentralised networking via SafetyBUS p and SafetyNET p.

Enjoy the benefits of approved, co-ordinated, complete solutions. Our portfolio is being extended to include control and signal devices such as E-STOP pushbuttons, compatible sensor technology such as safety switches, light curtains/light grids and safe camera systems as well as operator terminals for diagnostics and visualisation. A wide range of services round off our business activities.




*Pilz offers a universal concept for economical solutions.*



# PSS® programmable safety and control syst

**Safe, open, cost-effective**

With the aid of the PSS programmable safety and control systems from Pilz you can implement a wide variety of different automation solutions – ranging from the monitoring of safety-related functions right up to complete control systems for machines, plants and process sequences.

**Your requirements determine the system structure**

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

All of these options can all be implemented in a control solution which is tailored to your specific needs – with all the building blocks combining perfectly with each other to deliver a system you can really rely on.

**1 PSSmodular modular safety and control systems**

Two ranges for safety and control are available, offering you flexible options which will enable you to put together your own individual solution for centralised and decentralised control tasks in accordance with your own specific requirements. Please go to page 14 to find out more.

**2 PSScompact compact safety and control systems**

Six ranges for safety and control are available, allowing you to profit from a comprehensive selection of versatile and space-saving control solutions. Please go to page 22 to find out more.

**3 PSSuniversal decentralised periphery**

With our decentralised control platform for safety and control, a single system is enough to cover all of your input and output requirements. Please go to page 30 to find out more.

**4 Safe communications via SafetyBUS p**

Time-critical signals can be transferred quickly and without feedback using the open and safe bus system. Please go to page 38 to find out more.

**5 Networking of machines and plants with SafetyNET p**

Trust the open Ethernet system for safe, standard and real-time communications. Please go to page 50 to find out more.

**6 System software for PSS programmable safety and control systems**

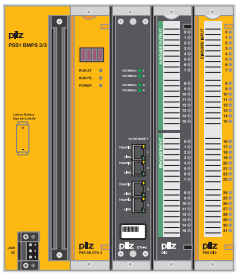
Practical software tools and a comprehensive selection of approved software function blocks will support you from programming right through to commissioning. Please go to page 54 to find out more.

**7 PVIS diagnostic concept for PSS programmable safety and control systems**

Just a few clicks of the mouse are all it takes to program your diagnostic system. Please go to page 62 to find out more.

# ems

1



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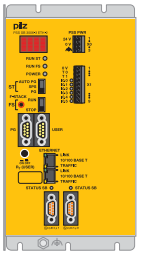

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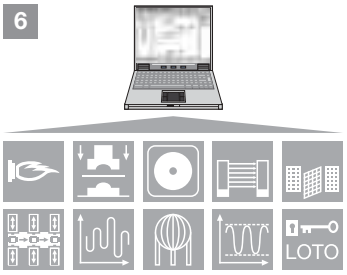


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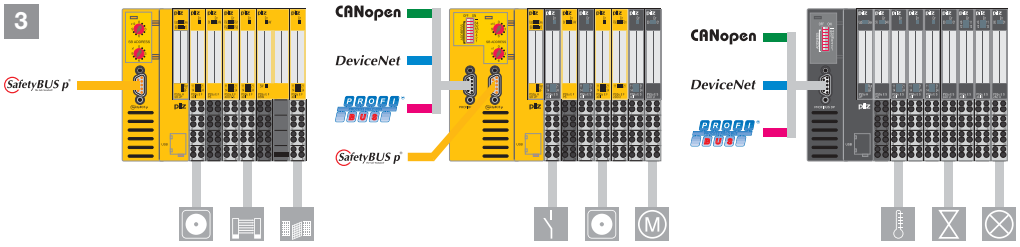


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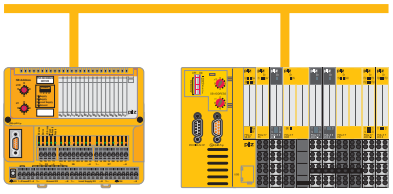
SafetyBUS p



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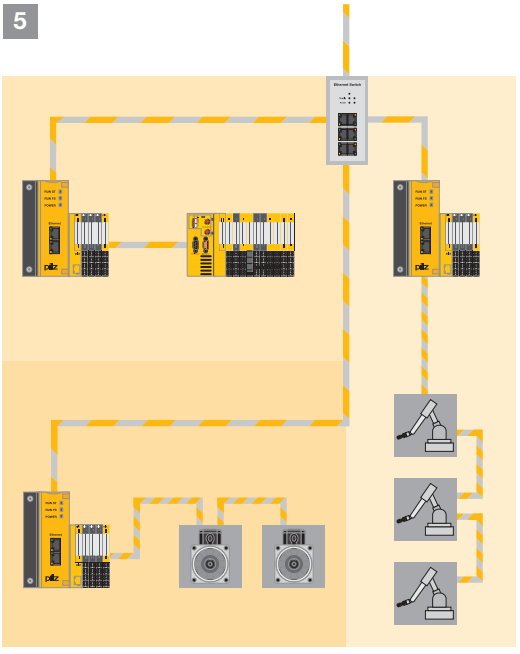

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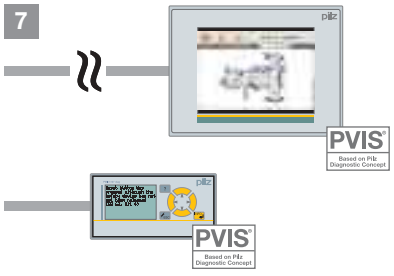


*Keep up to date with the latest information about PSS programmable safety and control systems:*

Webcode 0527

*Online information is available from www.pilz.com*



# Don‘t leave your success to chance

**The matching solution for every challenge**

Choose from our extensive portfolio of control systems which enables you to cover a wide variety of applications. The PSS programmable safety and control systems are the ideal solution:

- for complex stand-alone machines, including machines with high safety requirements like presses
- for integrated plants with decentralised networks, e.g. packaging machines
- for complete plant lines with decentralised networks, e.g. transfer lines

**An intelligent and future-proof investment**

Complete solutions from Pilz are based on many years of experience. The PSS programmable safety and control systems are continuously refined and improved with the aid of feedback from our customers – with whom we remain in constant contact – so that their investment is protected in the long term. As a result, the PSS systems meet all the requirements placed on safe and cost-effective automation solutions – both now and for the future.

**Plant control in accordance with international safety standards**

Pilz can offer extensive expertise in the field of safety technology. With the PSS programmable safety and control systems from Pilz, you can once again rely on a system solution which satisfies the most stringent safety requirements – in full accordance with the following international standards for machine safety:

- EN 954-1 up to Category 4
- EN IEC 61508 up to SIL3
- EN IEC 62061 up to SIL3
- prEN ISO 13849 up to PL e
- EN 60204-1
- NFPA 79

plus various application-specific standards, e.g. for:

- Press applications: EN 692, EN 693, EN 12622
- Railway applications: EN 50126, EN 50128 and EN 50129 each to SIL3, EN 50159-1
- Cable cars and cable lifts: EN 13243 AK4
- Burner management: EN 298

The PSS programmable safety and control systems have been approved by BG, TÜV and in accordance with UL/cUL.

*The PSS programmable safety and control systems can be used to control anything from complex stand-alone machines to complete plant lines.*

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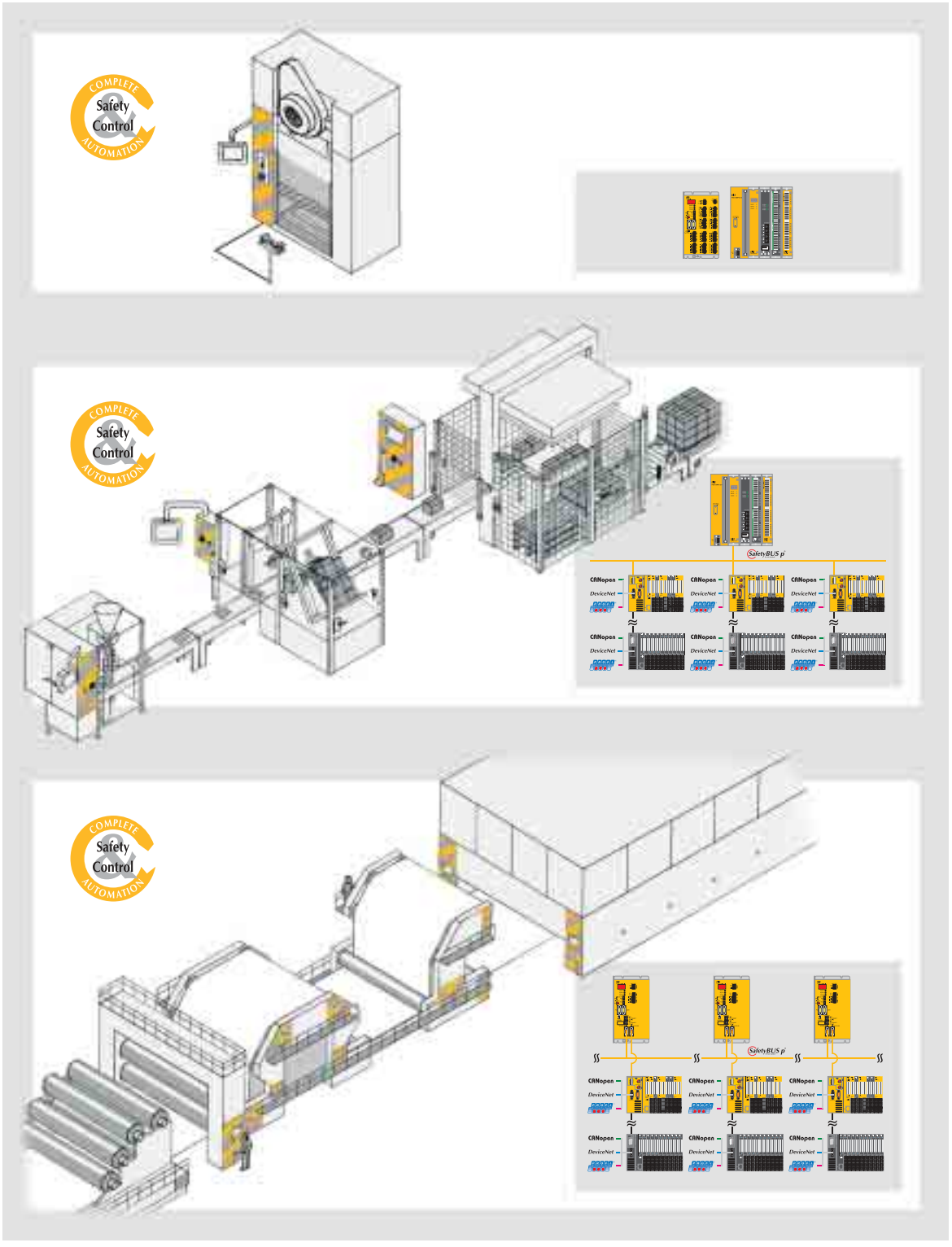
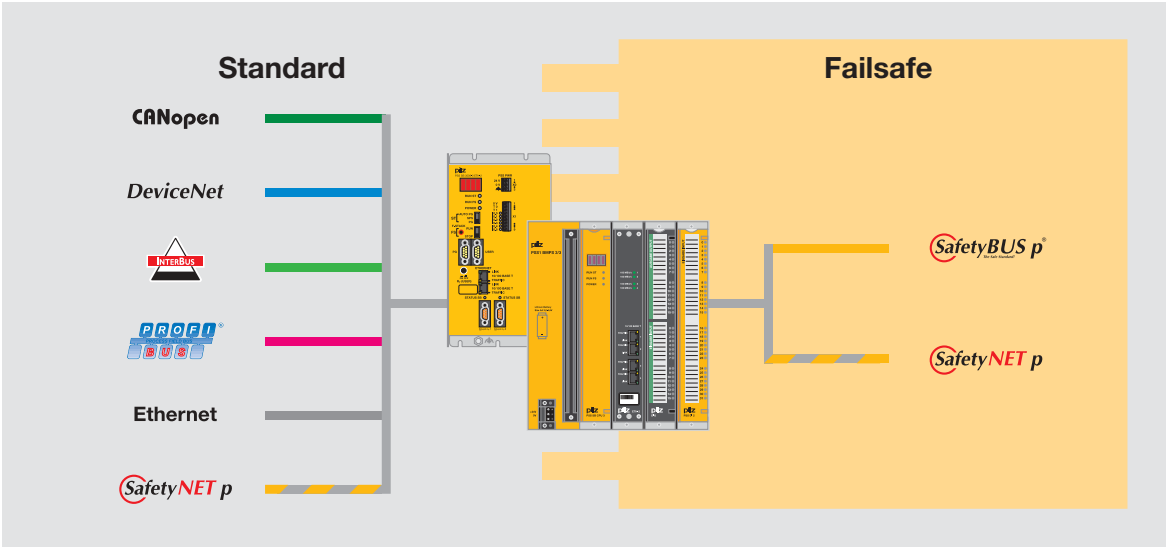




# Safe, open and cost-effective ...




**You can trust our universal system solutions for safe and standardised control technology**

With the aid of the PSS programmable safey and control systems from Pilz, you can monitor safety functions like E-STOP, light curtains and safety doors, whilst at the same time controlling a large number of standard control tasks like speed monitoring and temperature control.

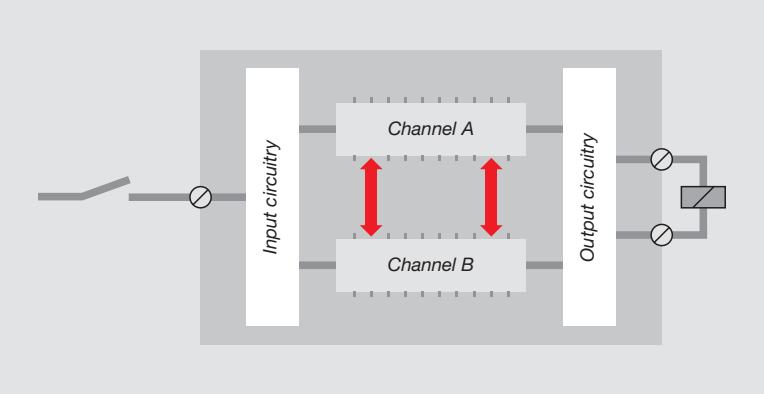
**Keep your systems independent with our open system connections**

With interfaces to all standard fieldbus systems, to Ethernet and to the safe and open bus system SafetyBUS p, your control concept will always remain independent. This allows you to integrate the PSS programmable control systems into existing architectures or to adapt the systems quickly and easily to changed requirements. This means that long-term protection of your investment is assured.

**Feedback-free communications guarantee maximum safety**

Nothing on the operational and process control side of a plant can be allowed to influence, compromise or, in the worst case, override the safety-related functions – whether intentionally or unintentionally.

The PSS programmable safety and control systems have a diverse and redundant layout, and they perform all safety-related and standard control tasks without feedback – which could make all the difference in an emergency.




*Simplified representation of the multi-channel safety section of the PSS programmable safety and control systems.*


*Should a hazardous event occur, the PSS programmable safety and control systems react particularly quickly.*

**Fast reactions save space**

The particularly fast reaction times of the PSS programmable safety and control systems and the fast data transfer rates via the safe and open bus system SafetyBUS p offer optimum protection for man and machine – as well as key economic advantages in terms of the space requirements for plant design:

- the faster the reaction to a hazardous event, the smaller the required safety gap between protective measures – e.g. safety doors or light curtains – and the danger zone;
- and smaller space requirements go hand-in-hand with greater cost savings.

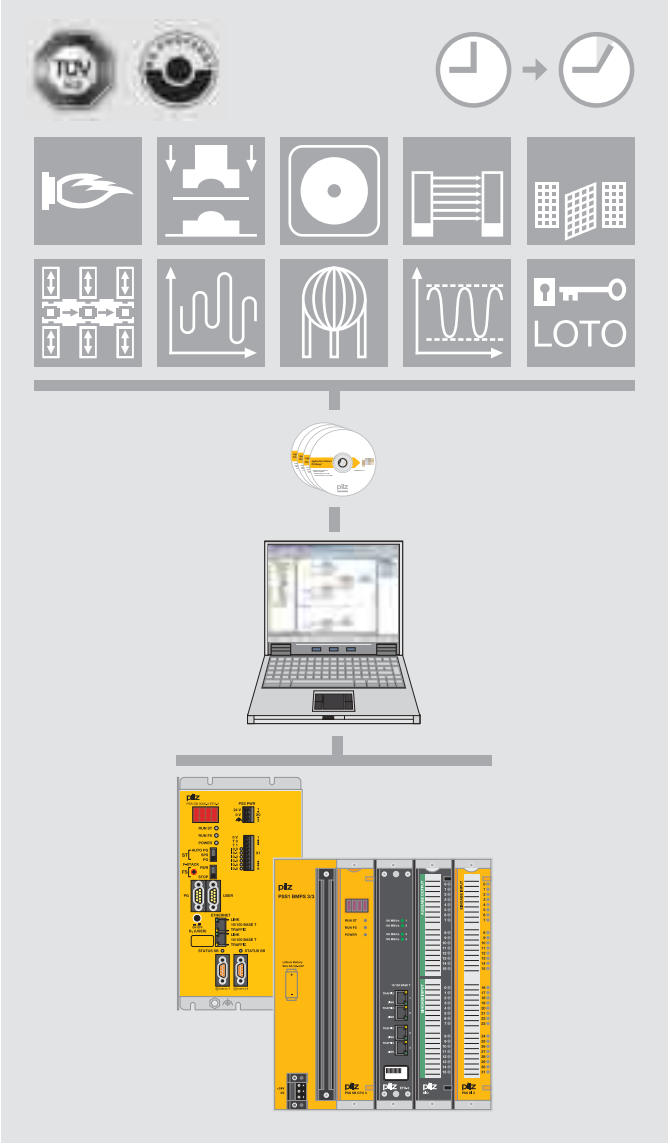
*All benefits at a glance:*

Webcode 0916

*Online information is available from www.pilz.com*



# ... from planning to implementation

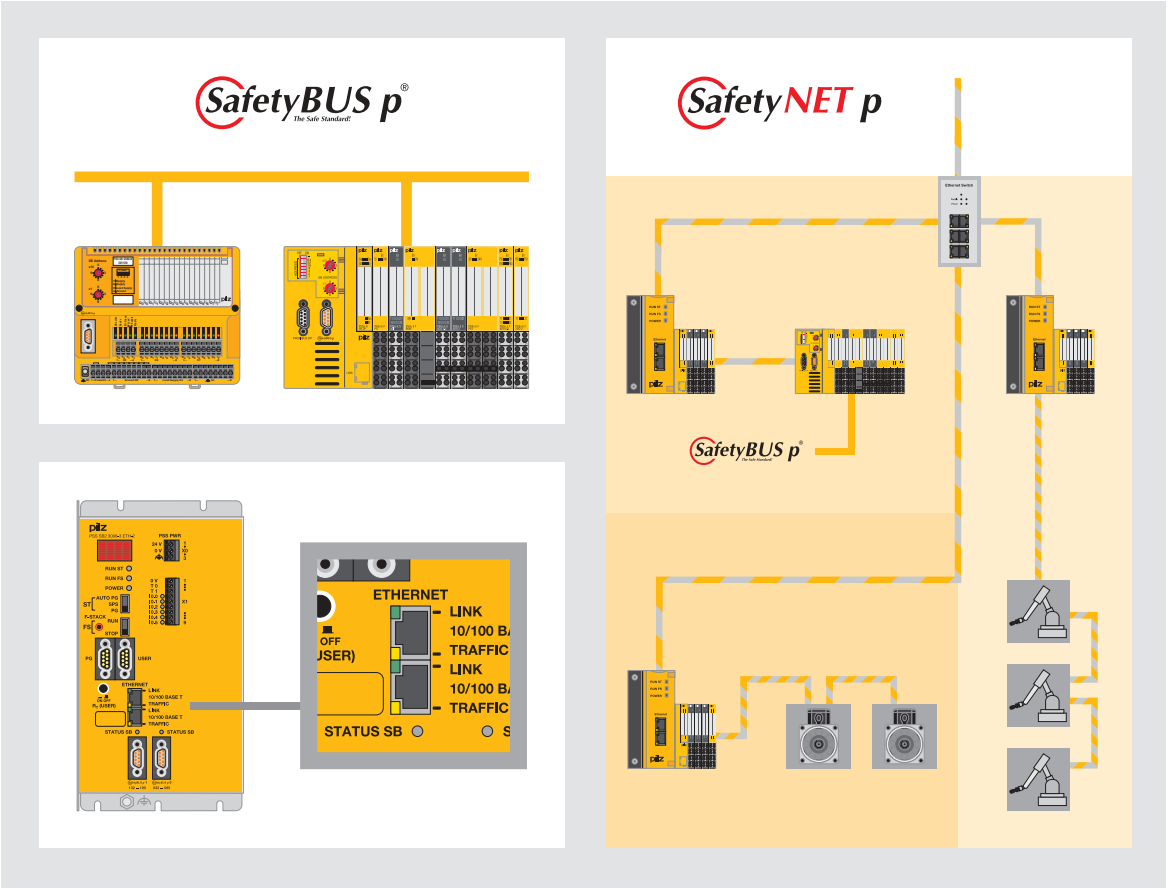



**Fast and simple programming with software function blocks**

Software packages with a total of more than 100 configurable software function blocks ease the implementation of safety-related and/or standard control functions in the application software. All you need to do is enter your plant-specific parameters.

**Your benefits at a glance**

- Flexible and adaptable system solution with a comprehensive selection of components
- Implementation of versatile control architectures with centralised and/or decentralised inputs and outputs
- Cost-effective implementation with one overall system for safety related and standard control tasks
- Compliance with the very highest safety requirements through international approval
- Space savings thanks to fast reaction times
- Independence thanks to the open system interfaces
- Fast and simple programming with ready-approved software function blocks




**High-speed communications and large network sizes with SafetyBUS p and SafetyNET p**

In large, complex and widely spread out plants, the input/output of control signals takes place directly in the field. This can only be done with the aid of high-performance automation networks:

- With the aid of the safe and open bus system SafetyBUS p, you can implement the safe transmission of time-critical information decentrally at field level.
- ETH-2 interfaces enable remote access to the PSS safety and control systems and offer the user all industrially relevant Ethernet protocols. Their master functionality makes it possible to build up complete Ethernet networks.
- With the aid of the open Ethernet system SafetyNET p, you can implement both the safe transmission of time-critical data as well as standard communications for the entire plant control. In dynamic applications, the transmission takes place in real-time.

*Keep up to date with the latest information about SafetyBUS p*

Webcode 0944

*Online information is available from www.pilz.com*

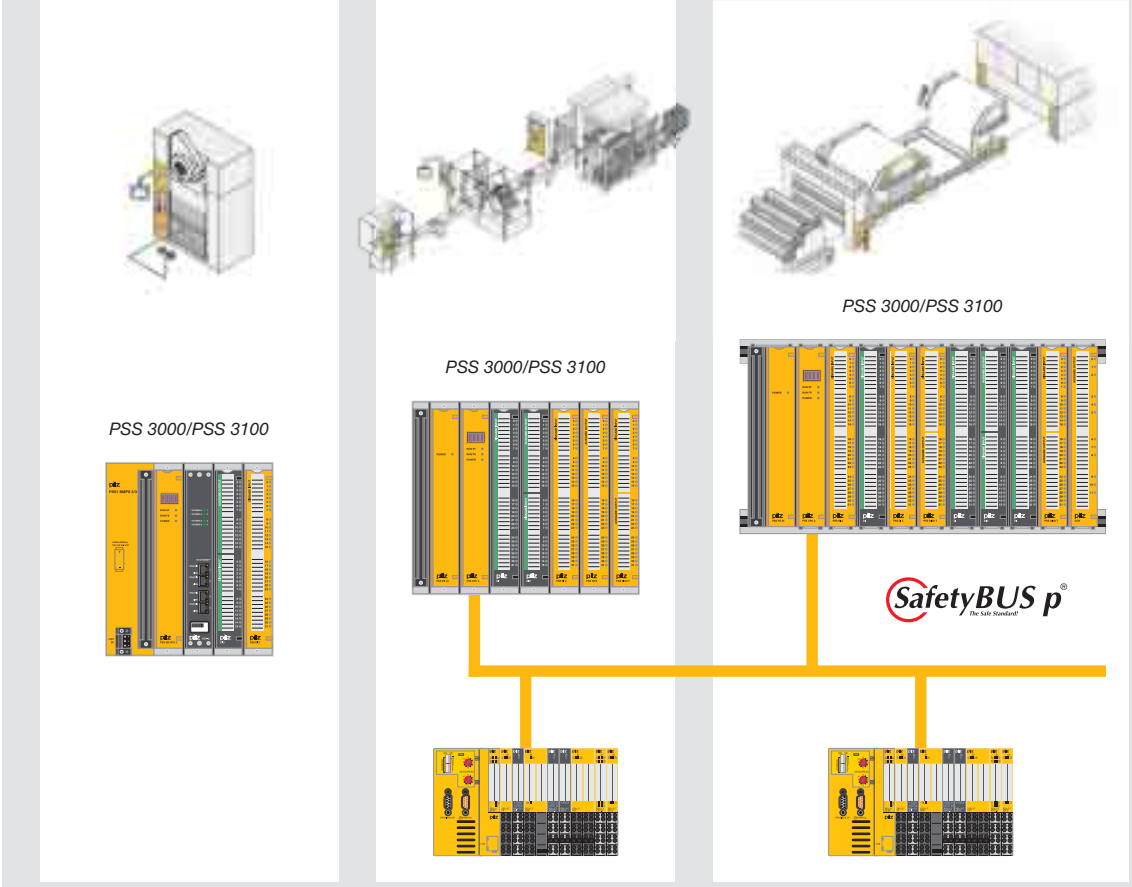
*Keep up to date with the latest information about SafetyNET p*

Webcode 1779

*Online information is available from www.pilz.com*



# PSSmodular safety and control systems




*PSS 3000 and PSS 3100 – allowing you to put together your own individual and flexible control solution*

**Two series for safety and control: PSS 3000 and PSS 3100**

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

- centrally – in complex and independent stand-alone machines, or
- decentrally – in integrated plants extending across widely branched areas

Communication interfaces to fieldbus systems, to the safe and open bus system SafetyBUS p and to the Ethernet enable quick integration into the complete control sequence of a plant.

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**When do I use which system?**

The modular safety and control system PSS 3000 is suitable even under tough application conditions, e.g. for press controls, fairground rides or in cable cars. All components feature a sturdy aluminium housing and can withstand increased mechanical loads. In applications requiring a large number of standard inputs and outputs, the PSS 3000 can be expanded with the aid of 2 expansion module racks in order to add further standard I/O modules.

In the PSS 3100, the printed circuit boards are exposed without a housing, which makes them suitable for production environments with low mechanical loads or stresses.

**Modular hardware structure**

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

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

**Your benefits at a glance**

- One safety and control system for safety-related and standard control tasks
- Flexible and adaptable modular hardware structure
- Highest performance thanks to fast program processing
- Digital and analogue processing offers versatile application potential
- Open connection to standard fieldbuses, Ethernet and SafetyBUS p
- Simple and fast installation of the modules

*Use one universal system for safety and standard in decentralised input/output applications: PSSuniversal – for more information please read from page 30 onwards.*

*Safety and control – one system for all control functions, e.g. in cable cars, fairground rides, presses and many more.*

*Keep up to date with the latest information about PSSmodular safety and control systems:*

Webcode 0911

*Online information is available from www.pilz.com*



# Selection guide – modular safety and cont

## Centralised units – PSSmodular controller

*PSS1 SB CPU3*

| PSS 3000 Series<br>Type<br>Order number | PSS 3100 Series<br>Type<br>Order number |
|---|---|
| **PSS CPU3**..... 301 064 | - |
| **PSS SB CPU3**..... 301 071 | - |
| **PSS SB CPU3 ETH-2** ... 301 081 | - |
| - | **PSS1 CPU3**.....302 064 |
| - | **PSS1 SB CPU3**.....302 071 |
| - | **PSS1 SB CPU3 ETH-2**[1)] ..302 081 |

## Module rack – PSSmodular controller

*PSS1 BMPS 3/3*

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

## Power supplies – PSSmodular controller

*PSS1 PS 24*

| PSS 3000 Series<br>Type<br>Order number | PSS 3100 Series<br>Type<br>Order number |
|---|---|
| **PSS PS**..... 301 050 | - |
| **PSS PS 24**..... 301 051 | - |
| - | **PSS1 PS 24**.....302 051 |

# rol systems PSSmodular

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

*[1] with expanded Ethernet functionality and programming via Ethernet; scanner and adapter function for Ethernet/IP protocol*

| Electrical data | Free slots | | Size (H x W x D) |
|---|---|---|---|
| Supply voltage | Quantity | Use | |
| - | 4 | For failsafe modules | 277.5 x 280 x 244 mm |
| - | 4 | For failsafe modules, 2 of which are for standard modules | 277.5 x 280 x 244 mm |
| - | 9 | For failsafe modules | 277.5 x 482.6 x 244 mm |
| - | 9 | For failsafe and standard modules, freely pluggable | 277.5 x 482.6 x 244 mm |
| 24 VDC | 3 | For failsafe and standard modules, freely pluggable, integral power supply | 266 x 259.4 x 245 mm |
| - | 5 | For failsafe modules, 2 of which are for standard modules | 266 x 340.6 x 241 mm |

**Electrical data**

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

*Technical documentation for the PSSmodular safety and control systems:*

Webcode 0685

*Online information is available from www.pilz.com*



# Selection guide – modular safety and cont

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

*PSS DI2O T*

*PSS1 DOR*

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

**Common features:**

- Application area: Failsafe applications according to EN 954-1, EN IEC 61508

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

*PSS DIO*

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

**Common features:**

- Application area: Non-safe standard applications

# rol systems PSSmodular

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

| Outputs | | | Features |
|---|---|---|---|
| Digital Semicon-ductor | Relay | Analogue -10 V … +10 V 0 … 20 mA | |
| - | - | 2 | Analogue current/voltage inputs and outputs |
| - | - | - | Digital inputs |
| 16 | - | - | Digital inputs, digital outputs (2 A) |
| 16 | - | - | Digital inputs, digital outputs (0.5 A) |
| 32 | - | - | Digital outputs (2 A) |
| 32 | - | - | Digital outputs (0.5 A) |
| - | 16 | - | Relay outputs<br>AC: max. 250 V/2 A/500 VA<br>DC: max. 100 V/0.5 A/50 W |

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

*Technical documentation for the PSSmodular modular safety and control systems:*

Webcode 0685

*Online information is available from www.pilz.com*



# Selection guide – modular safety and cont

## Communication modules for fieldbus systems and Ethernet – PSSmodular COM

*PSS ETH-2*

*PSS1 DN-S*

*PSS1 SER*

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

# rol systems PSSmodular

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

*[1)] Ethernet – ETH-2 with expanded functionality: Remote access, simple configuration via PSS WIN-PRO (Ethernet Configurator), ready for other industrial Ethernet protocols.*

Ethernet

DeviceNet

CANopen

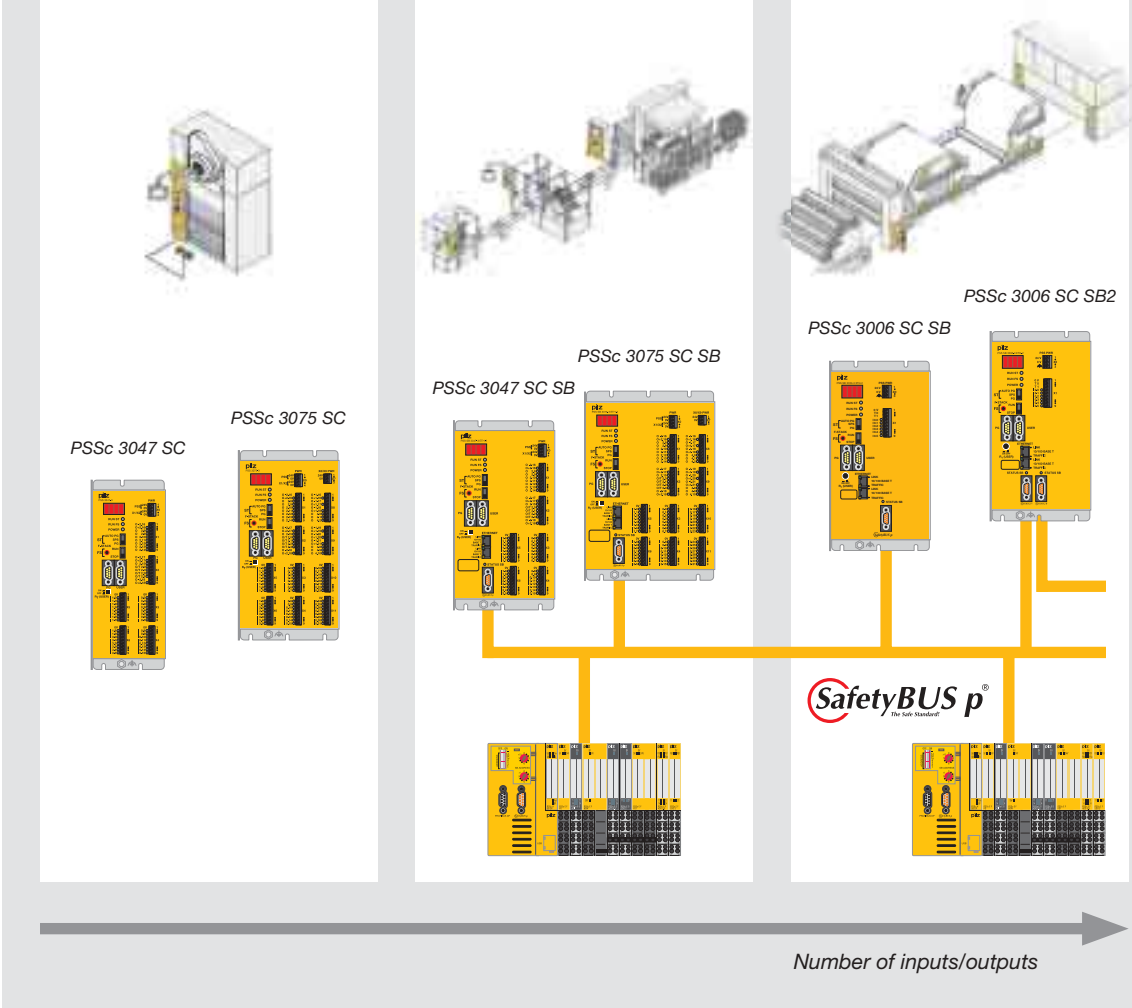
*Technical documentation for the PSSmodular safety and control systems:*

Webcode 0685

*Online information is available from www.pilz.com*



# PSScompact safety and control systems




*You can choose a suitable control solution for your needs from a comprehensive portfolio of products*

**Six series open the way to numerous application options**

Different plant projects require different control solutions. Just as well that the PSScompact control systems are suitable for such a wide range of uses!

**Centralised control of stand-alone machines**

Use the perfect solution with a constant number of sensors and actuators:

- PSSc 3047 SC – centralised control with 47 failsafe inputs and outputs
- PSSc 3075 SC – centralised control with 75 failsafe inputs and outputs

Example: Machining centres

more than automation
safe automation

**Centralised control with optional decentralised expansion via SafetyBUS p**

Reduce the amount of wiring involved on large stand-alone machines, yet still remain flexible for subsequent modifications and expansions:

- PSSc 3047 SC SB – centralised control with 47 failsafe inputs and outputs and decentralised expansion options via SafetyBUS p
- PSSc 3075 SC SB – centralised control with 75 failsafe inputs and outputs and decentralised expansion options via SafetyBUS p

In addition you can also link two centrally controlled stand-alone machines via the safe and open bus system SafetyBUS p and exchange safety-related information.

Example: Press brakes

**Decentralised control of extended plants via SafetyBUS p**

You can perfectly structure plant lines which extend over large areas and/or link machine units which operate independently to form interlinked plants:

- PSSc 3006 SC SB – decentralised control with up to 4 032 failsafe inputs and outputs via SafetyBUS p

Example: Packaging machines

**Double the network size with SafetyBUS p**

Benefit from a second SafetyBUS p interface and safely network widely distributed plants with a network size of up to 7 000 m:

- PSSc 3006 SC SB2 – for up to 8 064 decentralised failsafe inputs and outputs via SafetyBUS p

You can connect up to 126 bus subscribers.

Example: Cable car technology

**Your benefits at a glance**

- One safety and control system for safety-related and standard control tasks
- Space-saving, compact hardware layout
- Highest performance thanks to fast program processing
- Digital and analogue processing offers versatile application potential
- Open connection to standard fieldbuses, Ethernet and SafetyBUS p
- Comprehensive device portfolio for numerous applications
- Fast processing of time-critical processes and short response times through alarm processing

*Use one universal system for safety and standard in decentralised input/output applications: PSSuniversal – for more information please read from page 30 onwards.*

*Keep up to date with the latest information about PSScompact safety and control systems:*

Webcode 0914

*Online information is available from www.pilz.com*



# Selection guide – compact safety and cont

## Centralised safety control with 47 inputs/outputs – PSSc 3047 SC

*PSS 3047-3*

| Type | Inputs Digital[1] | Inputs Analogue | | Outputs |
|---|---|---|---|---|
| | | -10 V ... +10 V | 0 ... 25.5 mA | Single-pole[2] |
| **PSS 3047-3** | 32 | - | - | 12 |
| **PSS 3047-3 DP-S** | 32 | - | - | 12 |
| **PSS 3047-3 ETH-2[3]** | 32 | - | - | 12 |
| **PSS 3047-3 CANopen[4]** | 32 | - | - | 12 |
| **PSS 3047-3 AI** | 32 | 6 | - | 12 |
| **PSS 3047-3 AI Ip** | 32 | - | 6 | 12 |

## Centralised safety control with 47 inputs/outputs and decentralised expansion options via SafetyBUS p –

*PSS SB 3047-3 ETH-2*

| Type | Inputs Digital[1] | Inputs Analogue | | Outputs |
|---|---|---|---|---|
| | | -10 V ... +10 V | 0 ... 25.5 mA | Single-pole[2] |
| **PSS SB 3047-3 ETH-2[3]** | 32 | - | - | 12 |
| **PSS SB 3047-3 DP-S** | 32 | - | - | 12 |
| **PSS SB 3047-3 AI ETH-2[3]** | 32 | 6 | - | 12 |
| **PSS SB 3047-3 AI Ip ETH-2[3]** | 32 | - | 6 | 12 |

**Common features:**

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

# rol systems PSScompact

| Dual-pole | Communication: SafetyBUS p | Communication: PROFIBUS-DP | Communication: CANopen | Communication: Ethernet | Size: Width | Order number | Accessories – connector sets: Screw terminals | Accessories – connector sets: Spring-loaded terminals |
|---|---|---|---|---|---|---|---|---|
| 3 | | | | | 87.0 mm | 300 100 | PSS ZKL 3047-3 Order number: 300 900 | PSS ZKF 3047-3 Order number: 300 904 |
| 3 | | ◆ | | | 123.6 mm | 300 105 | | |
| 3 | | | | ◆ | 123.6 mm | 300 120 | | |
| 3 | | | ◆ | | 123.6 mm | 300 130 | | |
| 3 | | | | | 123.6 mm | 300 110 | PSS ZKL 3047-3 AI Order number: | PSS ZKF 3047-3 AI Order number: |
| 3 | | | | | 123.6 mm | 300 115 | | |

## PSSc 3047 SC SB

| Dual-pole | Communication: SafetyBUS p | Communication: PROFIBUS-DP | Communication: CANopen | Communication: Ethernet | Size: Width | Order number | Accessories – connector sets: Screw terminals | Accessories – connector sets: Spring-loaded terminals |
|---|---|---|---|---|---|---|---|---|
| 3 | ◆ | | | ◆ | 123.6 mm | 300 150 | PSS ZKL 3047-3 Order number: 300 900 | PSS ZKF 3047-3 Order number: 300 904 |
| 3 | ◆ | ◆ | | | 160.2 mm | 300 160 | | |
| 3 | ◆ | | | ◆ | 160.2 mm | 300 170 | PSS ZKL 3047-3 AI Order number: 300 902 | PSS ZKF 3047-3 AI Order number: 300 906 |
| 3 | ◆ | | | ◆ | 160.2 mm | 300 180 | | |

*[1] of which 6 are alarm inputs [2] of which 4 are test pulse outputs*
*[3] Ethernet – ETH-2 with expanded functionality: Remote access, simple configuration via PSS WIN-PRO (Ethernet Configurator), ready for other industrial Ethernet protocols, scanner and adapter function for Ethernet/IP protocols*
*[4] Master and slave function*

*Technical documentation for the PSScompact safety and control systems:*

Webcode 0685

*Online information is available from www.pilz.com*



# Selection guide – compact safety and cont

## Centralised safety control with 75 inputs/outputs – PSSc 3075 SC

*PSS 3075-3*

| Type | Inputs Digital[1] | Inputs Analogue | | Outputs |
|---|---|---|---|---|
| | | -10 V ... +10 V | 0 ... 25.5 mA | Single-pole[2] |
| **PSS 3075-3** | 48 | - | - | 18 |
| **PSS 3075-3 DP-S** | 48 | - | - | 18 |

## Centralised safety control with 75 inputs/outputs and decentralised expansion options via SafetyBUS p –

*PSS SB 3075-3 ETH-2*

| Type | Inputs Digital[1] | Inputs Analogue | | Outputs |
|---|---|---|---|---|
| | | -10 V ... +10 V | 0 ... 25.5 mA | Single-pole[2] |
| **PSS SB 3075-3 CANopen[4]** | 48 | - | - | 18 |
| **PSS SB 3075-3** | 48 | - | - | 18 |
| **PSS SB 3075-3 ETH-2[3]** | 48 | - | - | 18 |
| **PSS SB 3075-3 DP-S** | 48 | - | - | 18 |

**Common features:**

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

# rol systems PSScompact

| Dual-pole | Communication: SafetyBUS p | Communication: PROFIBUS-DP | Communication: CANopen | Communication: Ethernet | Size: Width | Order number | Accessories – connector sets: Screw terminals | Accessories – connector sets: Spring-loaded terminals |
|---|---|---|---|---|---|---|---|---|
| 9 | | | | | 123.6 mm | 300 200 | PSS ZKL 3075-3 Order number: 300 910 | PSS ZKF 3075-3 Order number: 300 912 |
| 9 | | ◆ | | | 160.2 mm | 300 205 | | |

## PSSc 3075 SC SB

| Dual-pole | Communication: SafetyBUS p | Communication: PROFIBUS-DP | Communication: CANopen | Communication: Ethernet | Size: Width | Order number | Accessories – connector sets: Screw terminals | Accessories – connector sets: Spring-loaded terminals |
|---|---|---|---|---|---|---|---|---|
| 9 | ◆ | | ◆ | | 196.8 mm | 300 230 | PSS ZKL 3075-3 Order number: 300 910 | PSS ZKF 3075-3 Order number: 300 912 |
| 9 | ◆ | | | | 160.2 mm | 300 240 | | |
| 9 | ◆ | | | ◆ | 160.2 mm | 300 250 | | |
| 9 | ◆ | ◆ | | | 196.8 mm | 300 255 | | |

*[1] of which 6 are alarm inputs [2] of which 4 are test pulse outputs*
*[3] Ethernet – ETH-2 with expanded functionality: Remote access, simple configuration via PSS WIN-PRO (Ethernet Configurator), ready for other industrial Ethernet protocols, scanner and adapter function for Ethernet/IP protocols*
*[4] Master and slave function*

*Technical documentation for the PSScompact safety and control systems:*

Webcode 0685

*Online information is available from www.pilz.com*



# Selection guide – compact safety and cont

## Decentralised safety control with up to 4 032 inputs/outputs via SafetyBUS p – PSSc 3006 SC SB

**Common features:**

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

*PSS SB 3006-3 ETH-2*

| Type | Inputs Digital |
|---|---|
| **PSS SB 3006-3 ETH** | 6 |
| **PSS SB 3006-3 ETH-2**[1)] | 6 |
| **PSS SB 3006-3 DP-S** | 6 |
| **PSS SB 3006-3 IBS-S** | 6 |
| **PSS SB 3006-3 DN-S** | 6 |
| **PSS SB 3006-3 CN-A** | 6 |
| **PSS SB 3006-3 ETH DP-S** | 6 |
| **PSS SB 3006-3 ETH IBS-S** | 6 |
| **PSS SB 3006-3 ETH-2 IBS-S**[1)] | 6 |
| **PSS SB 3006-3 ETH-2 DP-S**[1)] | 6 |

## Decentralised safety control with up to 8 064 inputs/outputs via SafetyBUS p – PSSc 3006 SC SB2

**Common features:**

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

*PSS SB2 3006-3 ETH-2*

| Type | Inputs Digital |
|---|---|
| **PSS SB2 3006-3 DP-S** | 6 |
| **PSS SB2 3006-3 IBS-S** | 6 |
| **PSS SB2 3006-3 DN-S** | 6 |
| **PSS SB2 3006-3 CN-A** | 6 |
| **PSS SB2 3006-3 ETH-2**[1)] | 6 |
| **PSS SB2 3006-3 ETH-2 DP-S**[1)] | 6 |
| **PSS SB2 3006-3 ETH-2 IBS-S**[1)] | 6 |

# rol systems PSScompact

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

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

[1] *Ethernet – ETH-2 with expanded functionality: Remote access, simple configuration via PSS WIN-PRO (Ethernet Configurator), ready for other industrial Ethernet protocols, scanner and adapter function for Ethernet/IP protocols*

SafetyBUS p

DeviceNet

Ethernet

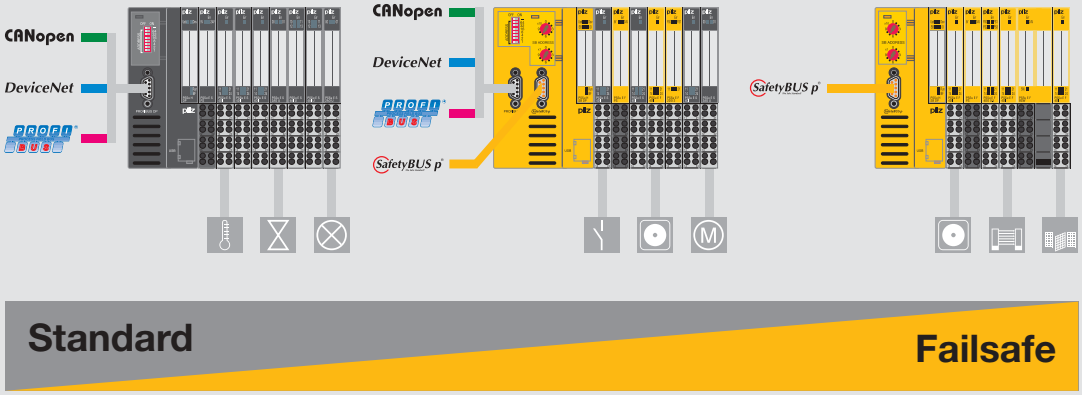
*Technical documentation for the PSScompact safety and control systems:*

Webcode 0685

*Online information is available from www.pilz.com*



# PSSuniversal decentralised periphery




*PSSuniversal – the future-proof control platform for safety and standard.*

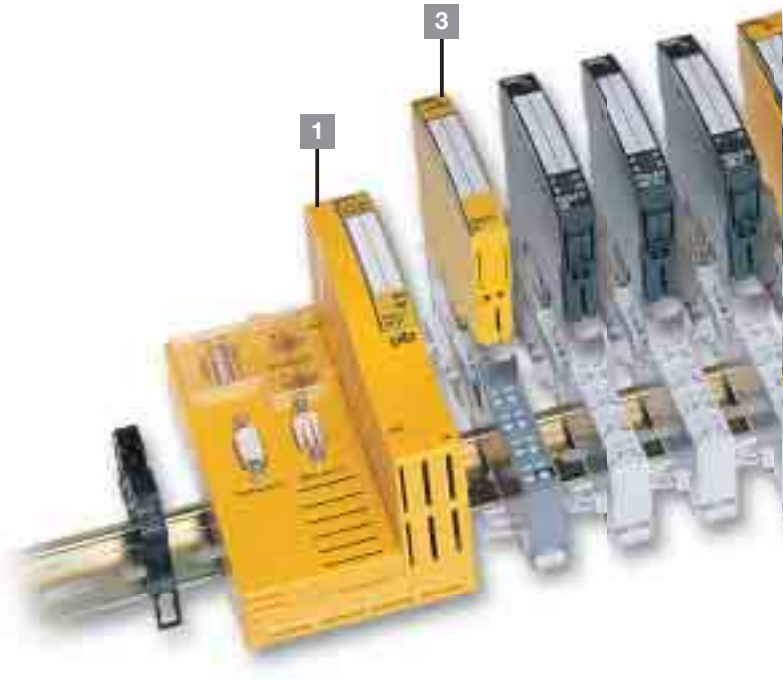
**One control platform for the entire I/O periphery**

With just one flexible system platform you can cover all of your input and output requirements:

- for safety-related functions
- for standard control functions
- or for both

**Modular system structure**

You can combine the input modules and output modules of the decentralised control platform according to your individual requirements and precisely match the system structure to your needs thanks to the fine granularity of the PSSuniversal modules. For subsequent system modifications you can simply add or replace modules.



**1 Head module**

Connects the sensor/actuator level with higher level controls via SafetyBUS p and/or standard fieldbus systems.

**2 Input and output modules**

For safe or non-safe, digital or analogue signal processing.

**3 Supply voltage module**

For internal power supply and the formation of a variety of potential groups.

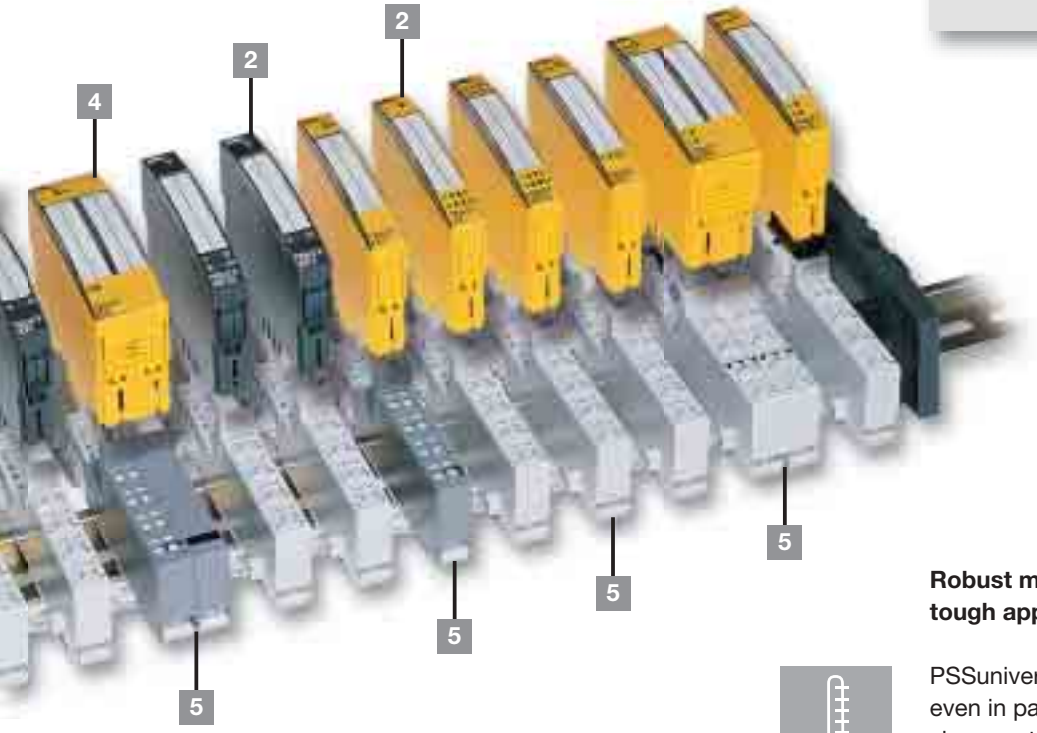
**4 Safe block shutdown module**

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

**5 Base modules**

Carrier units for the input/output modules, the supply voltage modules and the block shutdown module.

*System installation quick and easy.*




**Robust modules for tough application conditions**

PSSuniversal is suitable for use even in particularly tough environments, e.g. cable cars or track systems: special modules for expanded application areas are capable of withstanding temperatures from -30 °C to +60 °C, humidity and condensation. The selection guide offers a detailed overview of the modules.

*Module selection made easy – with the PSSuniversal Assistant.*

Webcode 1250

*For a free download go to www.pilz.com.*



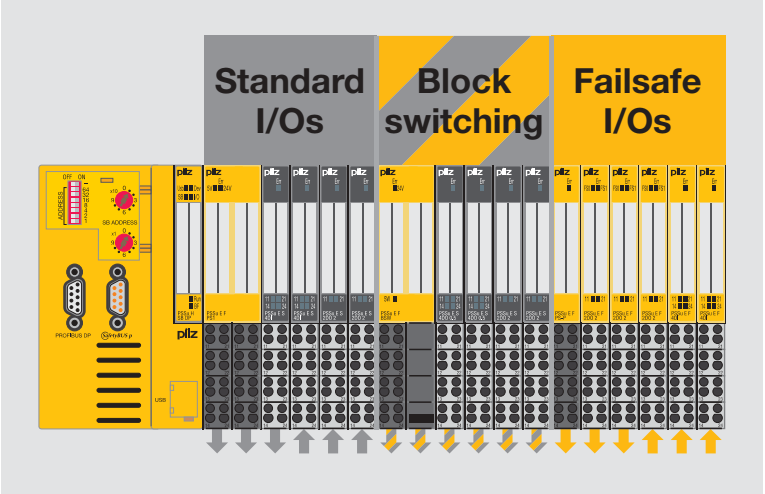
# PSSuniversal decentralised periphery

**Local enable principle reduces response times by up to 60 percent**

The local enable principle of the PSSuniversal decentralised control platform compares the incoming switching signals of the process control which are received at field level with the safe enable information of the PSS control and enables them if safe operation of the plant is ensured.

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


*The local enable principle ensures safe operation of your plant.*

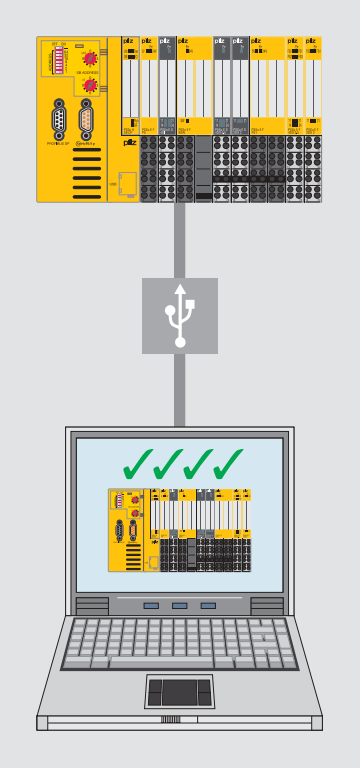



*In the event of a fault, the safe block shutdown of PSSuniversal ensures that certain sections are safely shut down, while other sections are allowed to continue operation.*

**Targeted, safe block shutdown of individual plant sections**

The safe block shutdown is used to switch off the supply voltage for a group of standard outputs (e.g. several motors) if a hazardous event occurs. This ensures the safe shutdown of a complete plant section if a hazardous event occurs – e.g. if an E-STOP button is pressed – while other sections are allowed to continue operation.

more than automation
safe automation



**Fast commissioning with independent periphery test**

With the aid of the new PSSuniversal Startup Software you can perform the first cable and function tests even before the commissioning of fieldbus systems and the control system. The complete periphery is thus already tested and functional when the control software is commissioned.

**Your benefits at a glance**

- One control platform for the entire I/O periphery
- Input/output of safety-related and standard control signals
- Modular and flexible system structure
- Comprehensive selection of modules
- Processing of digital and analogue signals
- Reduction of response times by more than 60 % through the local enable principle
- Optimised availability thanks to the safe block shutdown function
- Fast installation, fast module replacement
- Fast commissioning through independent periphery testing

*Keep up to date with the latest information about the PSSuniversal decentralised control platform:*

Webcode 0930

*Online information is available from www.pilz.com*



# Selection guide – decentralised periphery

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

*PSSu H SB DP*

| Type | Application range | | Communication | |
|---|---|---|---|---|
| | Failsafe functions | Standard functions | SafetyBUS p | CANopen |
| **PSSu H SB** | ◆ | | ◆ | |
| **PSSu H SB DP** | ◆ | ◆ | ◆ | |
| **PSSu H SB DN** | ◆ | ◆ | ◆ | |
| **PSSu H SB CAN** | ◆ | ◆ | ◆ | ◆ |
| **PSSu H CAN** | | ◆ | | ◆ |
| **PSSu H DP** | | ◆ | | |
| **PSSu H DN** | | ◆ | | |

## Supply modules, distribution modules and safe block shutdown module – PSSuniversal I/O

*PSSu E F PS*

*PSSu E PD*

| Type | Function | Application range | | Electrical data | |
|---|---|---|---|---|---|
| | | Failsafe functions | Standard functions | Supply voltage | Current carrying capacity Module supply |
| **PSSu E F PS** | Power supply | ◆ | ◆ | +16.8 ... +30 VDC | max. 1.5 A |
| **PSSu E F PS1** | Power supply, buffered | ◆ | ◆ | +16.8 ... +30 VDC | max. 0.7 A |
| **PSSu E F PS-P** | Power supply, periphery | ◆ | ◆ | +16.8 ... +30 VDC | - |
| **PSSu E PD** | Voltage distribution | | ◆ | - | - |
| **PSSu E PD1** | Voltage distribution | | ◆ | - | - |
| **PSSu E F BSW** | Block shutdown function | ◆ | ◆ | +16.8 ... +30 VDC | - |

*[1] Special modules "PSSu…-T" for expanded application ranges according to EN 60068-2-14, EN 60068-2-1, EN 60068-2-2, EN 60068-2-30, EN 60068-2-78; Ambient temperature: -30 … 60 °C; Storage temperature: -30 … 70 °C; Climatic suitability: 98 % r.h. at 40 °C; Condensation: yes*

# PSSuniversal

| DeviceNet | PROFIBUS-DP | Size H x W x D | Order number Regular version | Coated version[1] |
|---|---|---|---|---|
| | | 125.6 x 50.2 x 72.6 mm | 312 010 | 314 010 |
| | ◆ | 128.4 x 75.2 x 79.4 mm | 312 025 | 314 025 |
| ◆ | | 128.4 x 75.2 x 79.4 mm | 312 030 | 314 030 |
| | | 128.4 x 75.2 x 79.4 mm | 312 035 | 314 035 |
| | | 128.4 x 75.2 x 79.4 mm | 312 047 | - |
| | ◆ | 128.4 x 75.2 x 79.4 mm | 312 045 | - |
| ◆ | | 128.4 x 75.2 x 79.4 mm | 312 046 | - |

| Current carrying capacity Periphery supply | Order number Regular version | Coated version[1] | Screw terminals: Matching base module Order Number | PSSu BP 1/8 S[2]..... 312 600 | PSSu BP-C 1/8 S[3].... 312 610 | PSSu BP-C 2/16 S.... 312 630 | PSSu BS 1/8 S..... 312 650 | PSSu BS-R 1/8 S..... 312 652 | PSSu BS-R 2/8 S..... 312 654 | PSSu BS 2/8 S..... 312 656 | Cage clamp terminals: PSSu BP 1/8 C[2]..... 312 601 | PSSu BP-C 1/8 C[3].... 312 611 | PSSu BP-C 2/16 C ... 312 631 | PSSu BS 1/8 C ..... 312 651 | PSSu BS-R 1/8 C ..... 312 653 | PSSu BS-R 2/8 C ..... 312 655 | PSSu BS 2/8 C ..... 312 657 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| max. 10 A | 312 190 | 314 190 | | | | | ◆ | ◆ | | | | | | ◆ | ◆ | | |
| max. 10 A | 312 191 | 314 191 | | | | | | | ◆ | ◆ | | | | | | ◆ | ◆ |
| max. 10 A | 312 185 | 314 185 | | | | | ◆ | | | | | | | ◆ | | | |
| - | 312 195 | 314 195 | | ◆ | ◆ | | | | | | ◆ | ◆ | | | | | |
| - | 312 196 | 314 196 | | | | ◆ | | | | | | | ◆ | | | | |
| max. 8 A | 312 230 | - | | | | | | | | ◆ | | | | | | | ◆ |

*[2] without C-rail [3] with C-rail [4] for modules with failsafe function only*

*Technical documentation for the decentralised control platform PSSuniversal:*

Webcode 0685

*Online information is available from www.pilz.com*



# Selection guide – decentralised periphery

## Input/output modules for functional safety and standard control functions – PSSuniversal I/O

*PSSu E S 4DI*

*PSSu E F 4DI*

*PSSu E F 2DOR 8*

*PSSu E F BSW*

| Type | Function | Application range | | Electrical data |
|---|---|---|---|---|
| | | Failsafe functions | Standard functions | Inputs Quantity (value) |
| **PSSu E S 4DI** | Digital inputs | | ◆ | 4 |
| **PSSu E S 4DO 0.5** | Digital outputs | | ◆ | - |
| **PSSu E S 2DO 2** | Digital outputs | | ◆ | - |
| **PSSu E S 2AI U** | Analogue inputs | | ◆ | 2 (0 … 10 V s.e.; diff.; -10 … +10 V) |
| **PSSu E S 4AI U** | Analogue inputs | | ◆ | 4 (0 … 10 V s.e.) |
| **PSSu E S 2AI I se** | Analogue inputs | | ◆ | 2 (0 … 20 mA; 4 … 20 mA) |
| **PSSu E S 2AO U** | Analogue outputs | | ◆ | - |
| **PSSu E S 4AO U** | Analogue outputs | | ◆ | - |
| **PSSu E S 2AO I** | Analogue outputs | | ◆ | - |
| **PSSu E S ABS SSI** | Absolute encoder SSI | | ◆ | 1 (SSI) |
| **PSSu E S INC** | Incremental encoder | | ◆ | 1 (INC) |
| **PSSu E F 4DI** | Digital inputs | ◆ | | 4 |
| **PSSu E F 4DO 0.5** | Digital outputs | ◆ | | - |
| **PSSu E F 2DO 2** | Digital outputs | ◆ | | - |
| **PSSu E F DI OZ 2** | Digital outputs | ◆ | | 1 (feedback loop) |
| **PSSu E F 2DOR 8** | Relay outputs | ◆ | | - |
| **PSSu E F BSW** | Safe block shutdown | ◆ | ◆ | - |

**Common features:**

- Supply voltage from module supply: 5 VDC
- Electrical isolation

# PSSuniversal

| Outputs Quantity (value) | Current consumption from module supply | Order number Regular version | Order number Coated version[1] | Screw terminals Order number Matching base module | Screw terminals PSSu BP 1/8 S[2] ..... 312 600 | Screw terminals PSSu BP-C 1/8 S[3] .... 312 610 | Screw terminals PSSu BP-C 1/12 S.... 312 620 | Screw terminals PSSu BP-C 2/16 S.... 312 630 | Screw terminals PSSu BS 2/8 S..... 312 656 | Cage clamp terminals PSSu BP 1/8 C[2] ..... 312 601 | Cage clamp terminals PSSu BP-C 1/8 C[3] .... 312 611 | Cage clamp terminals PSSu BP-C 1/12 C ... 312 621 | Cage clamp terminals PSSu BP-C 2/16 C ... 312 631 | Cage clamp terminals PSSu BS 2/8 C ..... 312 657 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| - | 24 mA | 312 400 | 314 400 | | ◆ | | | | | ◆ | | | | |
| 4 (0.5 A) | 20 mA | 312 405 | 314 405 | | ◆ | ◆ | | | | ◆ | ◆ | | | |
| 2 (2 A) | 18 mA | 312 410 | 314 410 | | ◆ | ◆ | | | | ◆ | ◆ | | | |
| - | 43 mA | 312 440 | 314 440 | | ◆ | ◆ | | | | ◆ | ◆ | | | |
| - | 53 mA | 312 445 | 314 445 | | ◆ | ◆ | ◆ | | | ◆ | ◆ | ◆ | | |
| - | 43 mA | 312 450 | 314 450 | | ◆ | ◆ | | | | ◆ | ◆ | | | |
| 2 (0 … 10 V; -10 … +10 V) | 43 mA | 312 460 | 314 460 | | ◆ | ◆ | | | | ◆ | ◆ | | | |
| 4 (0 … 10 V) | 53 mA | 312 465 | 314 465 | | ◆ | ◆ | ◆ | | | ◆ | ◆ | ◆ | | |
| 2 (0 … 20 mA; 4 … 20 mA) | 43 mA | 312 470 | 314 470 | | ◆ | ◆ | | | | ◆ | ◆ | | | |
| - | 122 mA | 312 480 | 314 480 | | ◆ | | | | | ◆ | | | | |
| - | 122 mA | 312 485 | 314 485 | | | | | ◆ | | | | | ◆ | |
| 2 test pulse outputs | 23 mA | 312 200 | 314 200 | | ◆ | ◆ | | | | ◆ | ◆ | | | |
| 4 (0.5 A) | 56 mA | 312 210 | 314 210 | | ◆ | ◆ | | | | ◆ | ◆ | | | |
| 2 (2 A) | 45 mA | 312 215 | 314 215 | | ◆ | ◆ | | | | ◆ | ◆ | | | |
| 1 (2 A), dual-pole 1 test pulse output | 30 mA | 312 220 | 314 220 | | ◆ | ◆ | | | | ◆ | ◆ | | | |
| 2 N/O AC1: 250 V/8 A; 2 000 VA DC1: 24 V/ 8 A; 192 W | 40 mA | 312 225 | 314 225 | | | | | ◆ | | | | | ◆ | |
| - | 330 mA | 312 230 | 314 230 | | | | | | ◆ | | | | | ◆ |

*[1] Special modules "PSSu…-T" for expanded application ranges according to EN 60068-2-14, EN 60068-2-1, EN 60068-2-2, EN 60068-2-30, EN 60068-2-78; Ambient temperature: -30 … 60 °C; Storage temperature: -30 … 70 °C; Climatic suitability: 98 % r.h. at 40 °C; Condensation: yes*

*[2] without C-rail [3] with C-rail [4] for modules with failsafe function only*

[4]

[4]

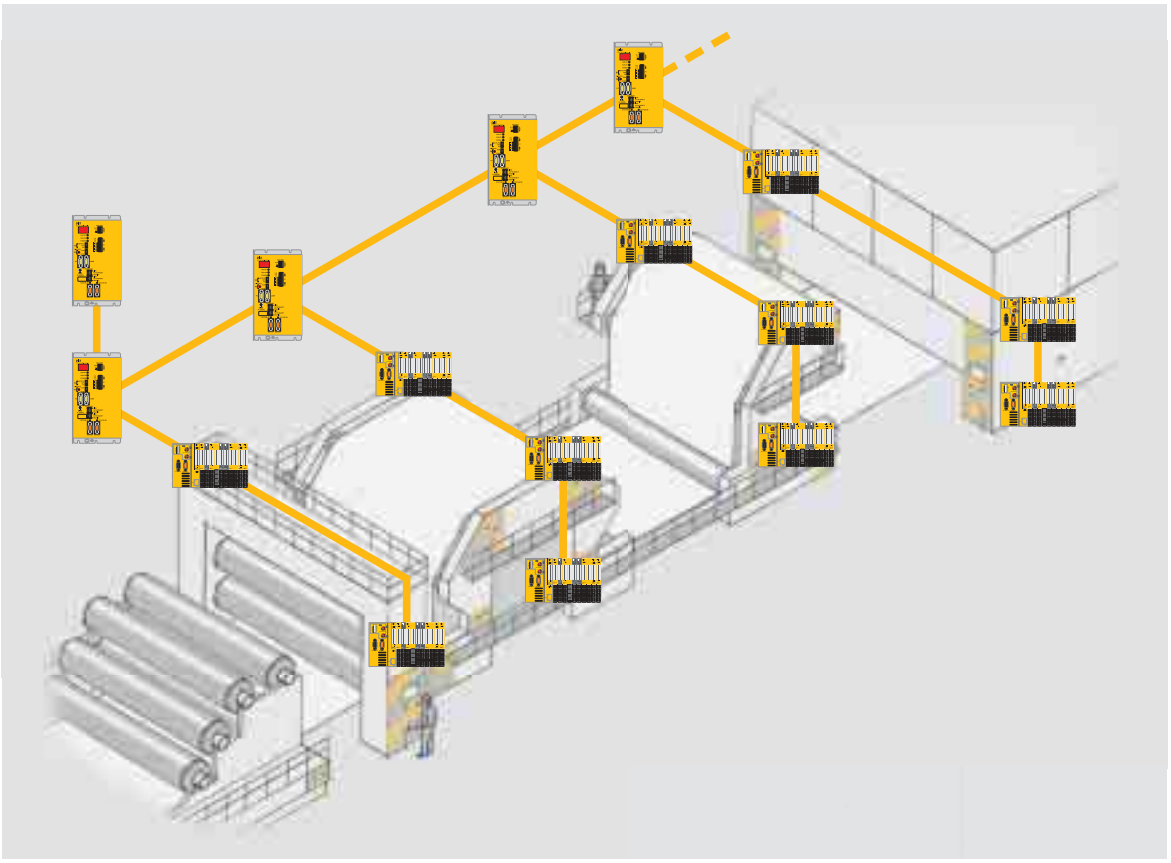
*Technical documentation for the decentralised control platform PSSuniversal:*

Webcode 0685

*Online information is available from www.pilz.com*



# Safe communications via SafetyBUS p®



**With SafetyBUS p you are always in the fast lane!**

If you need to transmit time-critical information quickly and safely in decentralised control structures then you need SafetyBUS p.

The bus system is based on the globally established fieldbus CAN and is equipped with an additional safety protocol which is approved by both TÜV and BG. SafetyBUS p meets the increased requirements for a safety bus in relation to reaction times, safety and freedom from feedback during signal transmissions.

more than automation
safe automation

**Why do you need a safety bus and a fieldbus in a parallel structure?**

In an emergency, the standard automation processes of a plant must not be allowed to influence the safety functions in any way.

The design guidelines of manufacturers and users often require a strict separation of safety technology and standard control technology – particularly in manufacturing processes or other processes which are potentially hazardous. This guarantees transparency and clearly defines the allocation of responsibility.

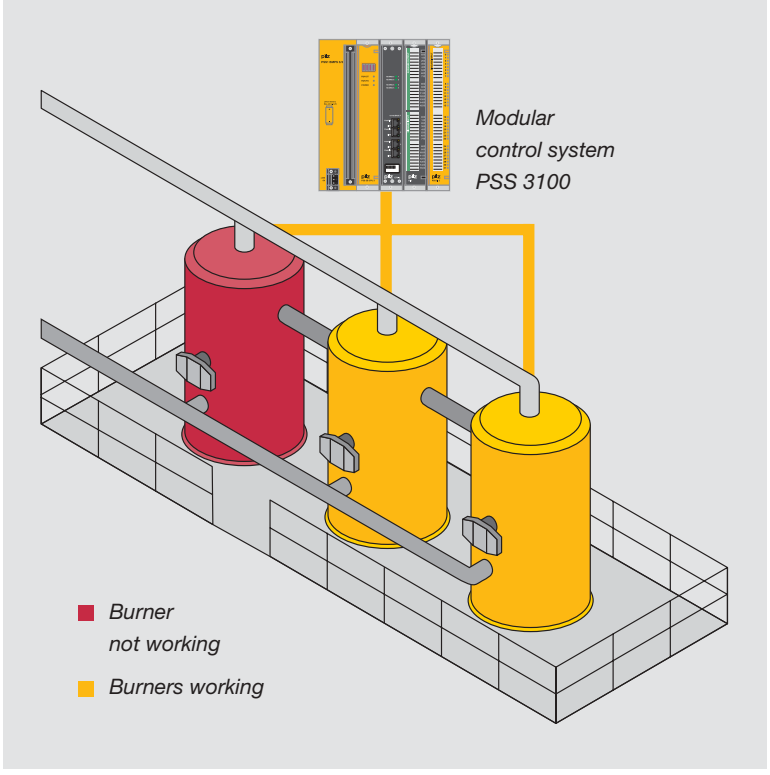
**Few downtimes thanks to safe selective shutdown**

Every subscriber to the SafetyBUS p can be assigned to a group. This allows plant sections which are linked and belong together logically within an application to be configured as groups and shut down separately in the event of a fault. The remaining production process is allowed to continue.

Higher-level functions like the E-STOP for the plant are assigned to all groups. With up to 32 groups within a SafetyBUS p network, this means that even complex structures can be reproduced.

**Your benefits at a glance**

- Decentralised, safe networking of sensors and actuators
- Safety technology no longer needs to be hard-wired
- Compliance with the very highest safety requirements in accordance with international standards
- Fast reaction times after hazardous events through event-driven transmission
- Extremely fast error response times of 25 ms or less
- Fewer downtimes thanks to integrated diagnostics
- Large network sizes with up to 4 032 inputs and outputs




*Principle of selective shutdown: Plant sections which belong together logically are configured as a group and shut down separately in the event of a fault.*

*Keep up to date with the latest information about SafetyBUS p*

Webcode 0944

*Online information is available from www.pilz.com*



# SafetyBUS p® – proven across industry

**An impressive success story**

SafetyBUS p is used successfully in conjunction with PSS programmable safety and control systems in many applications around the world:

- Automotive industry – monitoring of production processes in the press shop, body plants, powertrain, in the final vehicle assembly and in the paint shop
- Cable car technology – monitoring of the complete line, from the entry and exit points to the distance between cabins and the detection of cable positions
- Process technology – safe monitoring and closed-loop control of firing plants, monitoring of valves, fill levels and fuel-to-air ratios
- Conveyor technology – safe track and load monitoring, collision detection for crane and harbour applications, container loading/unloading and lifting platforms
- Airport automation – flexible controls and safe monitoring of refuelling stations, combined heat and power stations, rolling hangar doors, baggage handling systems and transport systems for check-in and cargo
- Steel and aluminium processing – safe monitoring during maintenance and restarting
- Packaging industry – safe monitoring of filling, mounting/placement and packaging processes

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# Safety Network International e. V.

**The innovative network**

Safety Network International e. V. has been operating as a forum for manufacturers, integrators and users since 1999.

In this time it has attracted more than 75 member companies, who work together on ongoing development of the SafetyBUS p system. Future developments will also focus on the SafetyNET p system.

Since being founded in 1999 (formerly known as SafetyBUS p Club International e. V.), the organisation has offered its members many services:

- Active collaboration in technical project groups in order to develop device profiles for integration of a wide range of devices into SafetyBUS p and SafetyNET p
- Participation in technical seminars and workshops in order to share experiences and promote the use of SafetyBUS p and SafetyNET p in a wide range of application areas
- Certification and seals of conformity
- Access to technical documentation
- Monthly E-Newsletter with current information and application examples
- Joint press and public relations work, plus exhibitions at trade fairs

Safety Network International e.V.


SafetyBUS p® The Safe Standard!

SafetyNET p

Find out more about
Safety Network International e. V.:
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Telefax: +49 711 3409-449
E-Mail: info@safetybus.com
Internet: www.safetybus.com
www.safetynetp.com



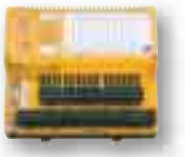
# Selection guide – decentralised periphery

## Decentralised, compact input/output unit for SafetyBUS p – PSSdio

### Common features

PSSdio input/output units monitor safety functions decentrally in the field. Communication with the PSS system is via the safe, open bus system SafetyBUS p.

- Supply voltage: 24 VDC
- Digital input and output circuits with redundant design for safety-related functions
- Galvanic isolation
- Connection type: Spring-loaded terminals or screw terminals
- Input delay: < 1 ms
- Dimensions (H x W x D): 140 x 170 x 65 mm



*PSS SB DI8OZ4*

| Type | Failsafe functions |
|---|---|
| **PSS SB DI16** | Digital inputs |
| **PSS SB DI8O8** | Digital inputs/outputs |
| **PSS SB DI8OZ4** | Digital inputs/outputs |

## Network components for SafetyBUS p

### Common features

Structure complex bus architectures into individual bus segments and make plants which extend over a wide area more powerful with decentralised control logic:

- Router – the logical division of your bus architecture
- Bridge – the link to rapid data transfer between two networks
- Active Junction – modular and flexible isolation of sub-branches
- Supply voltage: 24 VDC

*PSS SB BRIDGE*

*PSS SB ACTIVE JUNCTION BASIS*

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

*[1] Optocoupler*
*[2] Optocoupler between the SafetyBUS p main branch and the sub-branches*

# and network components SafetyBUS p®

| Inputs Digital | Outputs, positive-switching | Outputs, negative-switching | Test pulse outputs | Order number |
|---|---|---|---|---|
| 16 | - | - | 4 | 301 130 |
| 8 | 6 (2 A) | 2 (2 A) | 2 | 301 140 |
| 8 | 4 (2 A) | 4 (2 A) | 2 | 301 120 |


[6)]


[6)]

| Electrical data | | | SafetyBUS p | | Size (H x W x D) | Order number |
|---|---|---|---|---|---|---|
| Galvanic isolation | Sub-branches | Virtual cable runs | Connection | Data width | | |
| ◆[1)] | - | - | 2 female D-SUB connectors (9-pin) | - | 140 x 170 x 52 mm | 311 055 |
| ◆[1)] | - | - | 2 female D-SUB connectors (9-pin) | 32 bit as virtual I/Os (per SafetyBUS p network) | 140 x 170 x 52 mm | 301 131 |
| ◆[2)] | 2[3)] | 50 m | 1 female D-SUB connector (9-pin)[4) 5)] | - | 94 x 49.5 x 126 mm | 311 056 |
| ◆[2)] | 2[3)] | - | -[5)] | - | 94 x 26.5 x 121 mm | 311 057 |

*Technical documentation for the decentralised periphery and network components SafetyBUS p:*

Webcode 0685

*Online information is available from www.pilz.com*

*[3)] Max. 3 A load current per sub-branch, electronic short circuit protection, Integrated terminating resistor (120 Ω) per sub-branch, max. 6 sub-branches*
*[4)] Main branch: Female D-SUB connector (9-pin)* *[5)] Sub-branches: 4-pin screw connector*
*[6)] Only for PSS SB DI16, PSS SB DI8O8, PSS SB DI8OZ4 and PSS SB BRIDGE*



# Selection guide – SafetyBUS p® accessories

## Bus connector for SafetyBUS p

*PSS SB SUB-D4*

*PSS SB SUB-D4 DIAG*

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

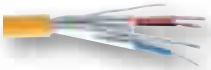
| Features | Order number |
|---|---|
| ▸ Connector for SafetyBUS p<br>▸ Dimensions (H x W x D): 81 x 47 x 16 mm<br>▸ Female D-SUB connector, 9-pin<br>▸ Connection type for the permissible cable types PSS SB BUSCABLE0 and PSS SB BUSCABLE0 MOVE: IDC terminals, cable diameter: 7.6 … 8.2 mm<br>▸ Single-core cross section: Max. 0.75 $mm^2$ | 311 040 |
| ▸ Connector for SafetyBUS p<br>▸ Dimensions (H x W x D): 81 x 47 x 16 mm<br>▸ Female D-SUB connector, 9-pin<br>▸ Male D-SUB connector (diagnostics), 9-pin<br>▸ Connection type for the permissible cable types PSS SB BUSCABLE0 and PSS SB BUSCABLE0 MOVE: IDC terminals, cable diameter: 7.6 … 8.2 mm<br>▸ Single-core cross section: Max. 0.75 $mm^2$ | 311 041 |
| ▸ Fibre-optic coupler for SafetyBUS p<br>▸ Dimensions (H x W x D): 84 x 48 x 16 mm<br>▸ Female D-SUB connector, 9-pin<br>▸ Fibre-optic cable, ST connection for transmitter and receiver<br>▸ Graded index glass fibre 50/125 µm or 62.5/125 µm<br>▸ Eye safety: Laser Class 3a<br>▸ Supply voltage: 5 VDC through the bus subscriber's SafetyBUS p interface | 311 053 |



# Selection guide – SafetyBUS p® accessories

## Bus cable for SafetyBUS p

*PSS SB BUSCABLE0 MOVE*

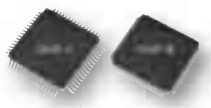


*PSS SB BUSCABLE0 HC*

| Type | Application range<br>Data transfer |
|---|---|
| **PSS SB BUSCABLE0** | ◆ |
| **PSS SB BUSCABLE0 MOVE** | ◆ |
| **PSS SB BUSCABLE0 LC** | ◆ |
| **PSS SB BUSCABLE0 HC** | ◆ |

## Network tester and chip set for SafetyBUS p

*PSS SB TESTER*



*PSS SB CHIPSET*

| Type | Application range |
|---|---|
| **PSS SB TESTER** | Network tester for SafetyBUS p |
| **PSS SB CHIPSET** | Connection of safety related applications to SafetyBUS p |

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

*[1)] plus Schirmleitung*

| Features | Order number |
|---|---|
| ▸ Power supply Ni-Cd 4.8 VDC rechargeable battery, 1 000 mAh<br>▸ Charger: 110/230 VAC, 50 Hz<br>▸ Display type: Single-colour graphic LC display<br>▸ Resolution: 128 x 64 pixels<br>▸ Interfaces: SafetyBUS p, USB<br>▸ Dimensions (H x W x D): 232 x 97 x 52 mm | German.....311 090<br>English.....311 091<br>French .....311 092 |
| ▸ Components: Chip A and Chip B<br>▸ Supply voltage: 5 VDC<br>▸ Tolerance range: 4.5 …5.5 VDC incl. residual ripple<br>▸ Data lines: 8-bit, two-way, dual-channel<br>▸ Address lines: 4-bit, two-way, dual-channel<br>▸ Control lines: 4-bit, dual-channel<br>▸ Send memory: FIFO, 3 x 12 byte messages<br>▸ Receive memory: FIFO, 3 x 12 byte messages<br>▸ Access: Bytewise<br>▸ Housing: QFP 64, 14 x 14 mm | 311 020 |

*[2)] for PSS SB CHIPSET only*



# Light curtains and light barriers for SafetyBUS p®

**Safety for man and machine**

Safeguard danger zones, protect man, machine and capital goods. Safely, effectively and cost-effectively with light curtains and light barriers from Pilz.

As they are non-wearing and have fast access times, light barriers and light curtains are particularly suitable for numerous applications and industries, for example:

- Metal and sheet metal working
- Robot systems and assembly lines
- Transport and conveyor systems
- Food and packaging machinery

**Simple installation, reduced number of components**

Light barriers with an integrated bus connection are suitable for use particularly in widely spread out plants or in applications where space is restricted.
With this system, all light barrier specific settings are stored centrally in the PSS control and activated via the safe bus system SafetyBUS p. External components like evaluation devices and installation distributors are no longer needed.

**Diagnostics make all the difference!**

Diagnostics are much more detailed via light barriers with an integrated SafetyBUS p connection: In addition to pure functional diagnostics and line diagnostics, information like misalignment, contamination signals, external light source, status of the power supply for the sender/receiver etc. is sent to the PSS programmable safety and control systems. As part of preventive maintenance, this diagnostic data helps to detect faults early, before they potentially cause the plant or machine to shut down.

**Your benefits at a glance**

- Less project configuration work as there are fewer components
- Reduced installation requirements, lower space requirements
- Reduced standstill times during ongoing operation through simplified troubleshooting and comprehensive diagnostic data
- Safe approved complete solution

*The complete one-stop solution: safe sensors PSEN from Pilz.*

Webcode 0219

*Online information is available from www.pilz.com*

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# Selection guide – PSENopt for SafetyBUS p®

## Light curtains and light barriers for SafetyBUS p – PSENopt SB


*PSEN opSB-4F*


*PSEN opSB-4H*


*PSEN opSB-4B*

| Type | Function | Optical data | | Order number |
|---|---|---|---|---|
| | | Operating range | Height of protected field | |
| **PSEN opSB-4F** | Finger protection for SafetyBUS p<br>Resolution: 14 mm | 0.2 … 6 m | 300 … 900 mm | ▸ PSEN opSB-4F-14-030.....630351<br>▸ PSEN opSB-4F-14-045.....630352<br>▸ PSEN opSB-4F-14-060.....630353<br>▸ PSEN opSB-4F-14-075.....630354<br>▸ PSEN opSB-4F-14-090.....630355 |
| **PSEN opSB-4H** | Hand protection for SafetyBUS p<br>Resolution: 30 mm | 0.2 … 15 m | 300 … 1650 mm | ▸ PSEN opSB-4H-30-030 .....630451<br>▸ PSEN opSB-4H-30-045 .....630452<br>▸ PSEN opSB-4H-30-060 .....630453<br>▸ PSEN opSB-4H-30-075 .....630454<br>▸ PSEN opSB-4H-30-090 .....630455<br>▸ PSEN opSB-4H-30-105 .....630456<br>▸ PSEN opSB-4H-30-120 .....630457<br>▸ PSEN opSB-4H-30-135 .....630458<br>▸ PSEN opSB-4H-30-150 .....630459<br>▸ PSEN opSB-4H-30-165 .....630460 |
| **PSEN opSB-4B** | Body protection for SafetyBUS p<br>2, 3 or 4 beams | 0.5 … 25 m | 500 … 1200 mm | ▸ PSEN opSB-4B-2-050 .....630550<br>▸ PSEN opSB-4B-3-080 .....630551<br>▸ PSEN opSB-4B-4-090 .....630552<br>▸ PSEN opSB-4B-4-120 .....630553 |

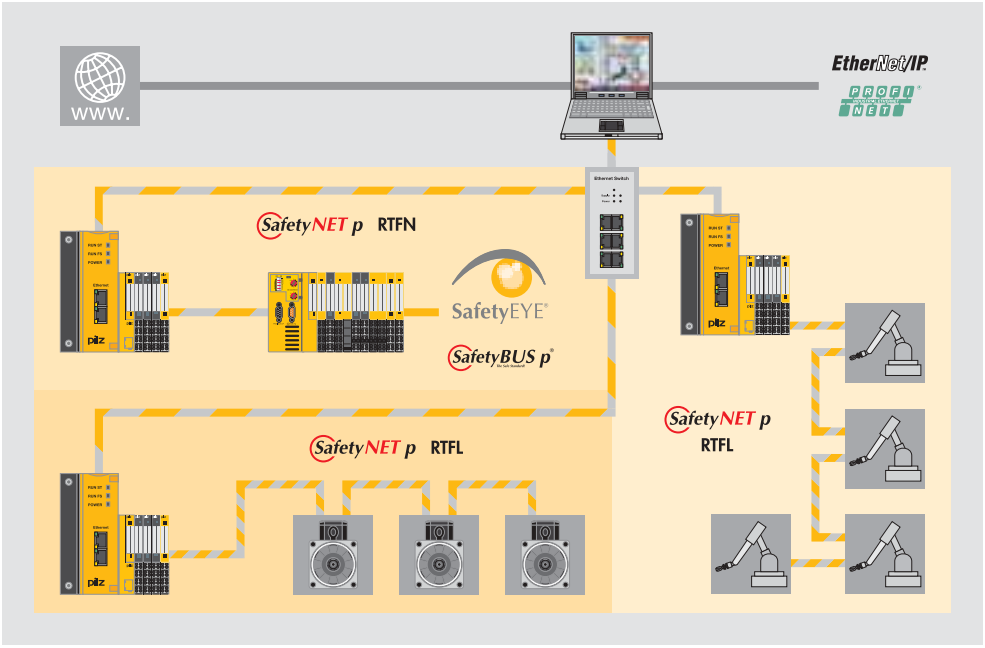
**Common features:**

- Comply with and are approved in accordance with DIN VDE 080 and EN IEC 61508
- Approved according to EN IEC 61496-1/-2: Type 4
- Can be used in applications in accordance with Category 4 of EN 954-1 for finger, hand and body protection
- Integral functions: Muting (total/partial)
- Integral SafetyBUS p interface
- Connection:
  Receiver Rx: M12, 8-pin and 5-pin.
  Sender Tx: M12, 4-pin
- Supply voltage: 24 VDC
- Dimensions (in mm):
  40 x 35 x length

SafetyBUS p®



# Networking of machines and plants with Saf




**Real-time Ethernet for complete automation**

SafetyNET p is based on standard Ethernet and can be used equally for real-time, standard and safe communication tasks in industrial automation applications:

- for the safe transmission of time-critical, safety related data
- for the transmission of information from the standard control process
- for the real-time transmission of all signals in highly dynamic applications with time-synchronous control

With a single system you can network all of the control functions of a machine or plant.

**Protection of investment and independence thanks to the open system design**

- Existing SafetyBUS p and fieldbus installations can be connected side-by-side to SafetyNET p
- Existing installations with other industrial Ethernet systems like PROFINET and Ethernet/IP can also be connected to SafetyNET p
- Any Ethernet device, e.g. PC, camera, printer etc., can be connected to SafetyNET p; IP-based Ethernet services like E-mail, Internet or streaming can be used in addition.

**SafetyNET p opens up new perspectives in control technology**

SafetyNET p offers cost-optimised flexibility in the complete networking of plants and machines. The system, which is based on the Ethernet standard, thus opens up new perspectives in control technology, such as:

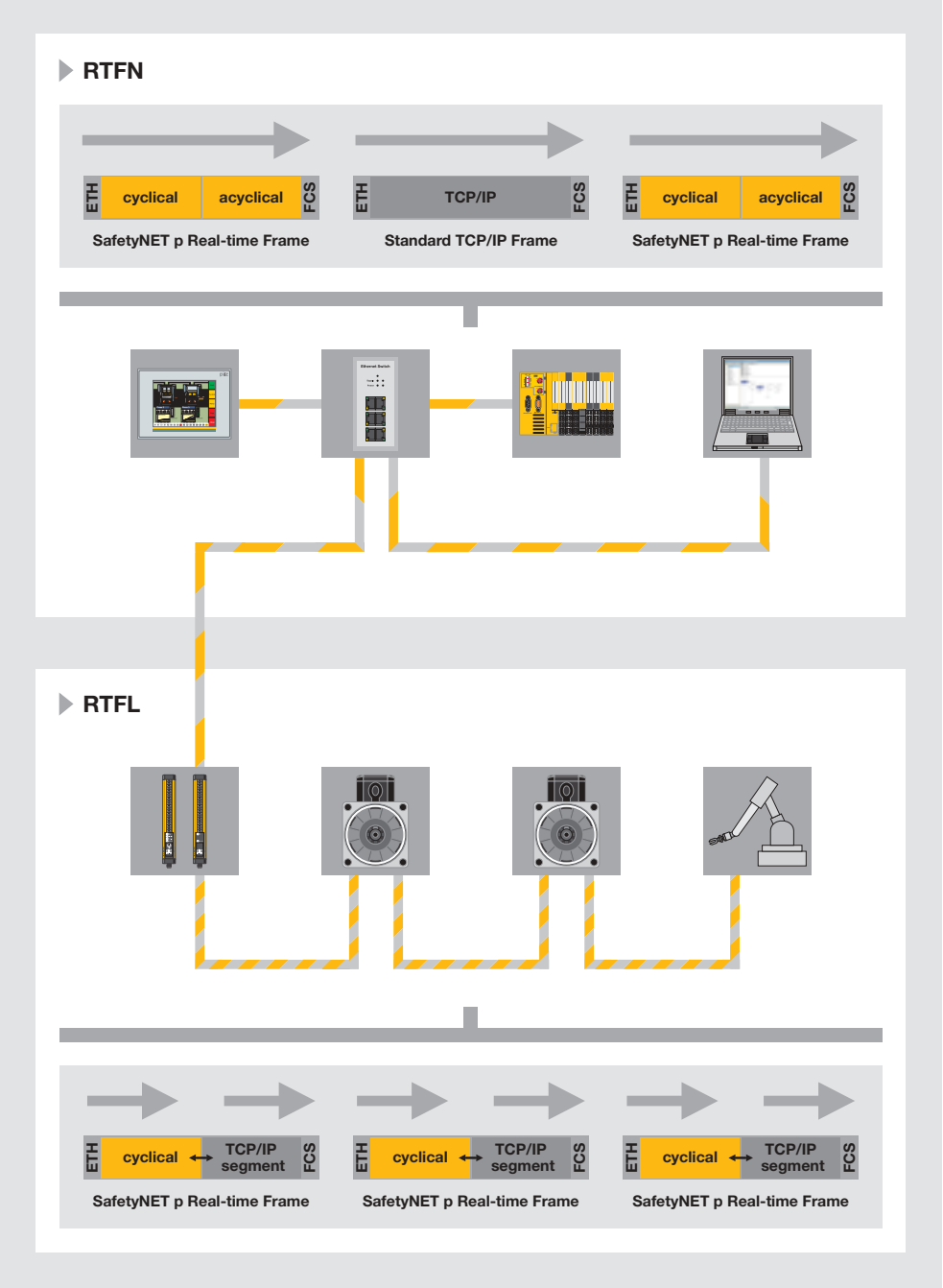
- Decentralisation of control intelligence directly to field level,
- whilst maintaining a central overview,
- and therefore the long-term realisation of functional machine modules.

# etyNET p

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

You can adapt SafetyNET p to a wide variety of requirements in automation technology and thus achieve the best possible value for money with just a single system:

- For real-time communications in highly dynamic applications, e.g. in filling and packaging plants, you should use the speed class RTFL (Real Time Frame Line) with deterministically guaranteed cycle times of 62.5 µs or less.
- For fieldbus-class communications and for the networking of individual production cells you should use the speed class RTFN with processing times of around 1 ms, as this is designed for the connection of many subscriber devices and for large network sizes.





# Networking of machines and plants with Saf

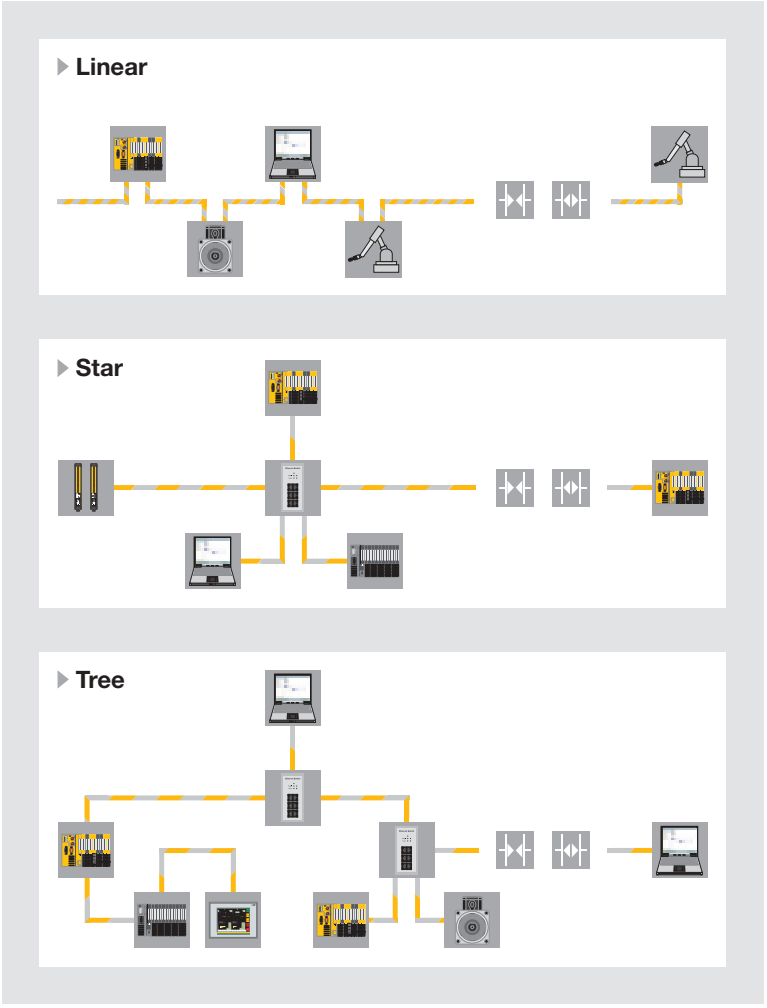
**Flexible topologies and dynamic structures**

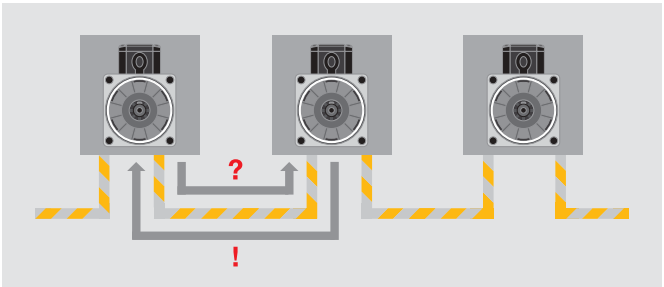
SafetyNET p supports a wide variety of topologies. It offers many versatile application options:

- Linear structure – optimised for fast cycle times and for the integration of existing bus structures
- Star structure – data exchange via a central node (e.g. CPU) allows devices to be switched on or off flexibly in the network
- Tree structure – network elements with the same or with different performance capabilities are brought together, offering the ideal solution for larger and more complex networks

All of the structures are dynamic. Network subscribers can be deactivated and replaced without the need to reconfigure the network. It can be used to:

- connect mobile devices if required, e.g. during maintenance and diagnostics
- and to implement changing configurations in the production process, e.g. during tool changes.




**High performance through cross-communication**

All of the components of the network have equal rights and can make use of or provide services. Cross-communication also enables the decentralised processing of data between two subscribers without the use of a central instance (“Producer-Consumer Model”). This saves time and increases the performance capability of the network.

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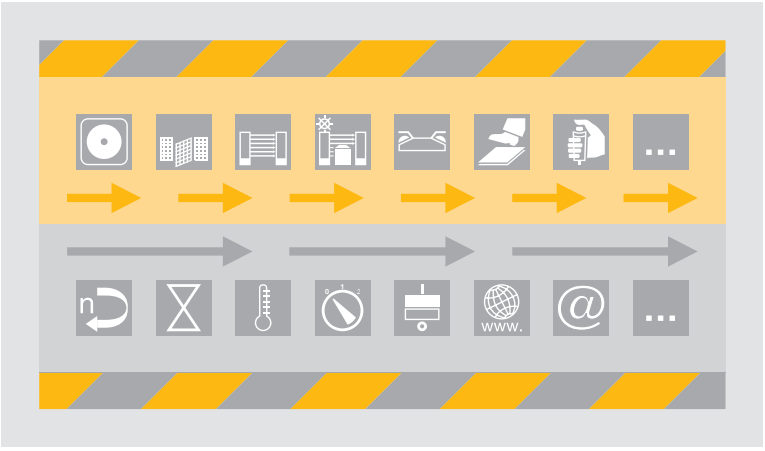
# etyNET p

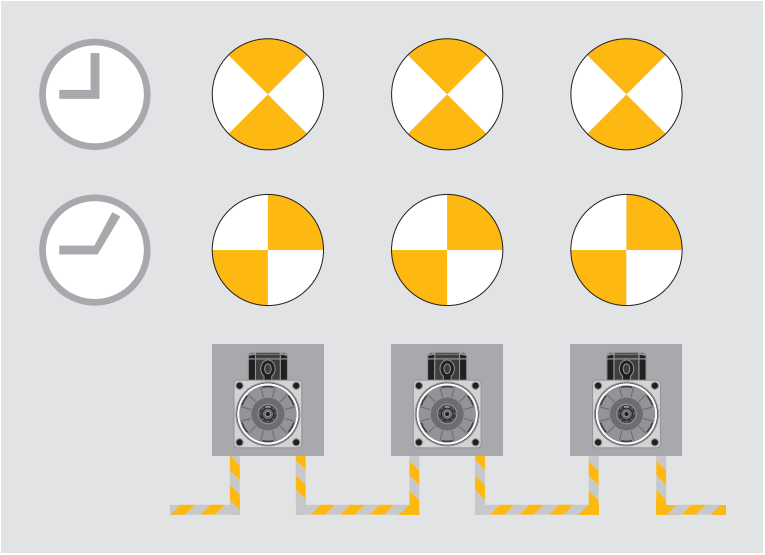



**Safety right from the start**

With the aid of SafetyNET p you can transmit safety related data and standard control information in physically mixed but logically separated form, which means that the data can be transmitted without feedback across a system. Here, the safety protocol is incorporated in the system from the onset and is not tagged on as an afterthought. The protocol structure ensures that the network transmissions are stable, so that telegrams with safety related information – e.g. the entry of a person into the danger zone of a plant – arrive safely at the intended recipient.

**Your benefits at a glance**

- Open, individually adaptable network solution for all automation tasks
- Safety right from the start
- Based on the Ethernet standard
- Real-time communications for highly dynamic applications
- Flexible topology structure
- Dynamic structures for subscriber changes
- Short cycle times of up to 62.5 µs
- High performance through cross-communication
- Open connection to existing SafetyBUS p, fieldbus and Ethernet installations
- Open for all IP-based Ethernet services and devices



**Highly deterministic behaviour through distributed, synchronous real-time clocks**

Information is processed time-synchronously in applications with distributed real-time applications. At an accurately defined point in time a guaranteed system reaction occurs. In systems which are networked with SafetyNET p, every subscriber device has a real-time clock with interrupt function for fast response to time-critical events.

*Keep up to date with the latest information about SafetyNET p*

Webcode 1779

*Online information is available from www.pilz.com*



# PSS WIN-PRO system software

**Universal system software with practical additional tools**

PSS WIN-PRO is powerful programming software for the design and implementation of complete PSS system solutions. From planning right through to commissioning you can benefit from the large scope of functionality:

- Copy function, used to transfer existing plant projects into new projects
- Block encryption for protection against unauthorised access
- Suitable for worldwide use thanks to language switching option
- User-friendly online handling, which makes troubleshooting easier during testing and commissioning

**Fast configuration of hardware and networks**

PSS WIN-PRO also offers practical additional tools which will make your task of configuring the system that much easier:

- PSSuniversal Assistant – for the configuration of the PSSuniversal decentralised input/output periphery
- SafetyBUS p Configurator – for the configuration of the SafetyBUS p safe bus system
- Ethernet Configurator – for the design of complete Ethernet networks

**User software is simple to program**

Configuration instead of programming! Reduce the time and effort spent on programming by making use of our comprehensive selection of software function blocks. Read more from page 58.

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**Meaningful diagnostics are just a few clicks away**

With the aid of the full version of PSS WIN-PRO including the PVIS diagnostic concept you can quickly and easily integrate unambiguous plain text messages, location information and step-by-step instructions into your diagnostics. Read more from page 62.

Service engineers can use the service version of PSS WIN-PRO to evaluate maintenance information and diagnostic data. This version only offers read-only access rights in order to prevent unauthorised or accidental manipulation of the control software.

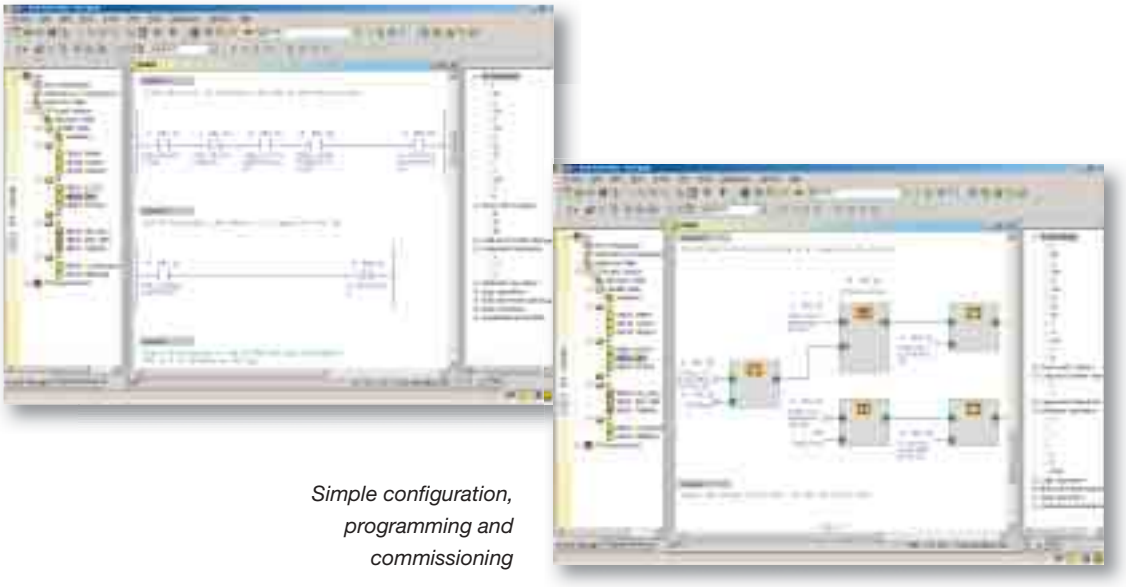
**Fast commissioning through independent periphery testing**

With the full version of PSS WIN-PRO including the PSSuniversal Startup Software you can perform periphery testing even before commissioning of the fieldbus system and control.

**Your benefits at a glance**

- Available as full and service versions
- Practical additional tools for fast configuration of the complete control solution
- Copy function for existing plant projects
- Comprehensive range of software function blocks
- Block encryption protects against manipulation
- Integrated PVIS diagnostic concept

PVIS®
Based on Pilz Diagnostic Concept



*Simple configuration, programming and commissioning*

*Keep up to date with the latest information about PSS-WIN PRO:*

Webcode 1531

*Online information is available from www.pilz.com*



# Selection guide – system software

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

| | Type | Features |
|---|---|---|
|  | **PSS WIN-PRO CD**<br>System software | ▸ Programming software PSS WIN-PRO<br>▸ Windows-based user interface:<br>German, English, French and Spanish (switchable)<br>▸ Programming languages: IL, LD, FBD (selectable)<br>▸ Online help<br>▸ Also includes:<br>- PSSuniversal Assistant configuration software<br>- PSSuniversal Startup Software<br>- Ethernet Configurator<br>- SafetyBUS p Configurator<br>- PVIS diagnostic concept |
|  | **PSSuniversal Startup Software incl. PSSuniversal Assistant**<br>Configuration and independent periphery testing of the decentralised PSSuniversal control patform | ▸ Functional testing of a PSSuniversal system via the integral USB port, without the controller connected<br>▸ Switching the FS and ST outputs on and off<br>▸ Status indication for the inputs (assists e.g. the control panel builder during wiring checks)<br>▸ Online help |
|  | **PVIS OPC Server, PVIS ActiveX Control, PVIS OPC Configurator**<br>Diagnostic software | ▸ Diagnostic display according to the Pilz diagnostic concept PVIS on the Pilz operator terminals PMIvisu, PMIopen or on industrial PCs<br>▸ Display of the triggering fault, display of step-by-step remedy information for the user<br>▸ Diagnostic texts and remedies are created by simply selecting them from a list of preconfigured texts in PSS WIN-PRO<br>▸ Diagnostic data is called up from the control through PVIS ActiveX Control or other OPC clients<br>▸ Process data is called up from the control through other OPC clients (e.g. visualisation software)<br>▸ Configuration of the PVIS OPC server via PVIS OPC Configurator |

## Planning and product selection guides

| | |
|---|---|
| **Pilz Service Applications CD**<br>2D and 3D product macros for EPLAN 5.50 and eCabinet | ▸ User interface: German and English |

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

*[1] Also available with manual*

*[2] Further licensing conditions available on request*

*[3] Free licence for Startup Software PSSuniversal Assistant*

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

*Technical documentation for the system software:*

Webcode 0685

*Online information is available from www.pilz.com*



# Software function blocks for safety and con

**Just program faster!**

Reduce the time and effort spent on programming standardised control processes by making use of our comprehensive selection of software function blocks.

**Software function blocks for the safety related section of your plant**

Control and monitoring of safety related functions made easy, e.g. for:

- Transfer lines
- Eccentric presses
- Hydraulic presses
- Tank farm installation
- Applications in burner management
- Control engineering applications
- Locked stop
- General E-STOP functions, safety gate functions, light barrier functions
- Applications with analogue inputs
- Applications with an IFM sensor
- Applications with Fiessler AKAS

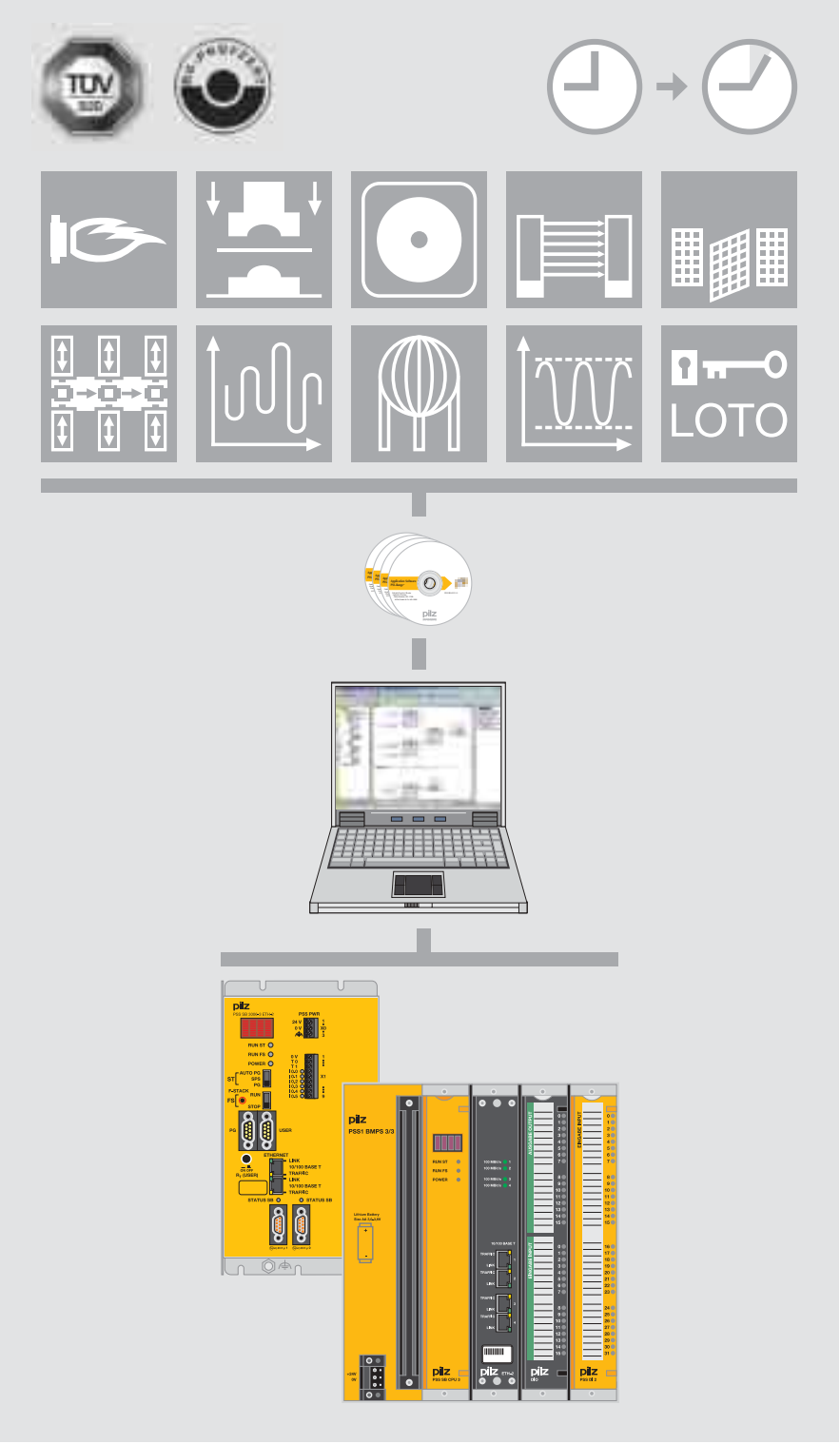
The highest level of safety and optimum protection for man and machine: All software function blocks have already been approved by BG and TÜV. All you need to do is enter your plant-specific parameters.

**Software function blocks for standard control tasks**

Fast integration of the PSS programmable safety and control systems:

- into existing fieldbus networks and Ethernet networks via corresponding drivers
- direct connection via communication modules or user interfaces
- indirect connection via external gateways

# trol




*Reduce the time and effort spent on programming by using ready-approved software function blocks.*

*Keep up to date with the latest information about software function blocks:*

Webcode 1531

*Online information is available from www.pilz.com*



# Selection guide – software function blocks

## Software function blocks for functional safety

| Type | Function | Order number |
|---|---|---|
| **PSS-SB-NOT Software package E-STOP** | Software function blocks for monitoring and evaluation of E-STOP functions | 301 176… |
| **PSS-SB-TRA Software package Transfer line** | Software function blocks for electrically monitored safety devices on integrated plants | 301 175… |
| **PSS-SB-EXZ2 Software package Eccentric presses** | Software function blocks for safety devices on eccentric presses or on press lines | 301 172… |
| **PSS-SB-HYD Software package Hydraulic presses** | Software function blocks for safety devices on hydraulic presses or press lines | 301 173… |
| **PSS-SB-AKAS Software package Fiessler AKAS** | Software function blocks SB230 for actuation and monitoring of the AKAS press brake protection | 301 188… |
| **PSS-SB-AI2 Software package Analogue input** | Software function blocks for monitoring and reading analogue values from the PSS input modules | 301 183… |
| **PSS-SB-GLT Software package Tank farm installation** | Software function blocks for monitoring of safety related functions on tank farm installations | 301 177… |
| **PSS-SB-FT Software package Burner management** | Software function blocks for flexible program generation for actuation and monitoring of various burner types | 301 181… |
| **PSS-SB-REGLER Software package Control engineering** | Software function blocks for failsafe control and monitoring of the fuel-to-air ratio of a burner, plus PID controller for controlling firing plants and process engineering processes | 301 187… |
| **PSS-SB-VSTOPP Software package Locked stop** | Software function blocks for a locked stop of the plant and for prevention of an inadvertent re-startup of the machine | 301 184… |
| **PSS-SB-SENSOR Software package IFM sensor** | Software function block for the evaluation of the inductive safety switch of IFM | 301 189… |

## Software packages for the standard section (control)

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

*When ordering: Please indicate the code for the required licence type together with your order (B = basic licence, K = copy licence, U = update licence, G = general licence).*

*[1] for software function blocks for functional safety only*

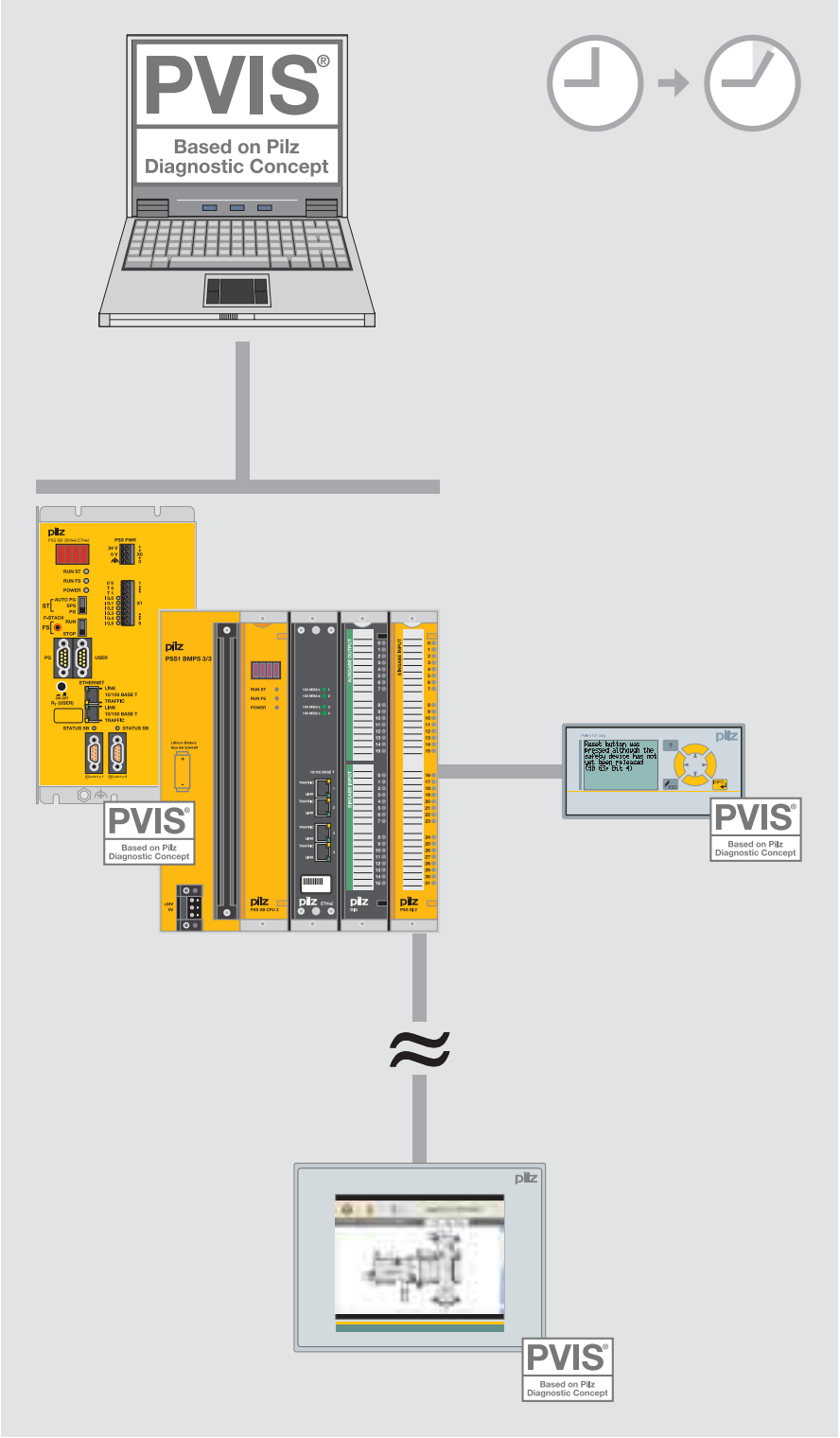
*Technical documentation for software function blocks:*

Webcode 0685

*Online information is available from www.pilz.com*



# Intelligent diagnostic concept PVIS®




**Diagnostic configuration with just a few clicks**

With the aid of the system software PSS WIN-PRO including the PVIS diagnostic concept you can integrate preconfigured diagnostic texts with just a few clicks, or adapt the texts to your specific application.

You decide when and where the diagnostic data should be available:

- directly at the PSS safety and control system via the service version of PSS WIN-PRO and a PC connection
- via the PMImicro diag diagnostic device as a compact on-site plug and play solution (connection via serial user interface)
- via PMIvisu graphic touch terminals with the PVIS OPC Server
- at control level within your visualisation with the PVIS OPC Server

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*Project configuration with just a few clicks*


*First failure detection*

*Graphics location information*

*Concrete solution proposals – step-by-step*

**Your benefits at a glance**

- Save time: just a few clicks and your configuration is complete
- Unambiguous, plain-text error messages
- First-fault detection – the triggering event is always at the top
- Graphical location information
- Practical solution proposals help to get production restarted quickly
- Simple to operate, without any knowledge of programming

**Early detection instead of downtime**

Keep a clear overview of your plant at all times and avoid down-times with the PVIS intelligent diagnostic concept from Pilz. The proactive solution that offers the following:

- Concrete, plain-text fault descriptions,
- Step-by-step solution proposals,
- An accurate definition of responsibilities
- and unambiguous information about the fault location.

PVIS®
Based on Pilz Diagnostic Concept

*Use our PMI operator terminals for visualisation:*

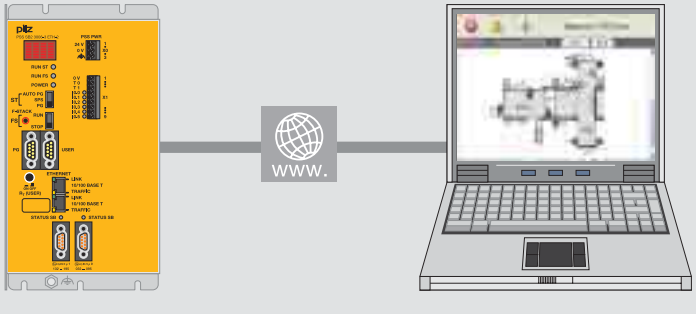
Webcode 0222

*Online information is available from www.pilz.com*

*Keep up to date with the latest information about the PVIS diagnostic concept:*

Webcode 0391

*Online information is available from www.pilz.com*




**Remote diagnostics**

Long travel times and distances are now a thing of the past! With Ethernet interfaces, diagnostic data can be remotely accessed during servicing. The two control families PSSmodular and PSScompact are each equipped with ETH-2 interfaces for this purpose.

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