



► New in 2022

For your automation solutions

PILZ
THE SPIRIT OF SAFETY



► What's new in 2022

for your automation solutions

Pilz provides automation solutions for plant and machinery: complete and simple. From sensor technology to control and drive technology – safety and automation included. Various software tools enable simple operation and make commissioning easier. Benefit from short downtimes and high plant availability due to extensive diagnostic options. Here we present our product innovations for 2022 for your safe automation.

Further information is available on our homepage at www.pilz.com. Simply enter the webcode listed on the following pages.

Content

Safe monitoring of the cardboard feed on packaging machines	4	Safe motion – new motion monitoring functions for drive-integrated safety!	16
The world's first UL-certified Type 3 safety light curtains PSENopt II	6	I/O module with protection type IP67 and PROFINET/PROFIsafe	18
Safe protection zone monitoring, even for robotic applications: PSENradar and PNOZmulti 2	8	Safe automation of AGVs	20
Safe small controllers PNOZmulti 2 – standalone base unit PNOZ m C0	10	Safe operation of AGVs	22
Safe small controllers PNOZmulti 2 – modular for simple applications	12	CEFS – Certified Expert in Functional Safety	24
Safe small controllers PNOZmulti Configurator – new full version 11	14		

► Safe monitoring of the cardboard feed on packaging machines

NEW



With this Pilz solution, you can increase the safety and productivity of your packaging machines! The solution is used in the cardboard feed to prevent an operator from reaching into the machine through the empty material feed opening and being injured. While there are sufficient cardboard boxes in the magazine, the cardboard boxes will cover the opening and it will be impossible to reach into the danger zone while the machine is running. The opening of the movable guard can be safeguarded as follows: if the defined minimum amount of cardboard boxes is reached or undershot in the magazine, the outputs of the programmable safety system shut down the machine. The machine remains stopped until sufficient cardboard boxes are once again filled and production can start up again. You can choose either the safe small controller PNOZmulti 2 or the modular safety relay myPNOZ. Two optical sensors are required for each feed device. You are in safe hands and reduce the downtimes of your machine with this TÜV-SÜD-certified solution.



Your benefits at a glance

- TÜV SÜD-certified solution for PL d/Cat. 3 of EN ISO 13849-1 or SIL 2 of IEC 62061: ready-to-use solution saves costs and time
- Higher productivity of the machine: packaging material provides natural protection; fences or the like are not needed
- Cost saving: no costly mechanical devices
- Higher level of personnel safety: minimized risk of accident thanks to use of safe control technology in combination with optical sensors
- Simple integration in existing applications and retrofit possible
- High reliability in the detection of different packaging materials



Safe monitoring of the cardboard feed on packaging machines



PNOZ m B0.1

PNOZmulti
ConfiguratormyPNOZ
systemSensor
O300.GP.2-11246332

Technical features

- ▶ TÜV SÜD-certified solution for PL d/Cat. 3 of EN ISO 13849-1 or SIL 2 of IEC 62061
- ▶ Solution consists of:
 - The safe small controllers PNOZmulti 2 (all base units from the PNOZmulti 2 product range can be used) or
 - Modular safety relay with the type code myPNOZ.91.CKA360AB000XB700 with semiconductor outputs or myPNOZ.03.CKA360AB000XD700 with relay outputs and
 - 2 optical sensors O300.GP.2-11246332 for each cardboard feed/cardboard magazine
- ▶ Pulsed by PNOZmulti 2 or myPNOZ
- ▶ Short response times of the sensors; point/beam shape; background suppression; operating distance 30 – 100 mm; M8 4-pin connector; 12.9 mm wide
- ▶ Further information is available from the solution description under webcode web230900.

Order number

- | | |
|--|--------------------|
| ▶ PNOZ m B0/PNOZ m B0.1 | 772 100/772 104 |
| - Plug-in spring-loaded terminals | 751 008 |
| - Plug-in screw terminals | 750 008 |
| - Chip card 8 kByte/32 kByte | 779 201/779 211 |
| - Mini USB cable, 3 m/5 m | 312 992/312 993 |
| - Software tool PNOZmulti Configurator, from V11.0 | No licensing costs |
| ▶ Safety relay myPNOZ, Creator type code | |
| - myPNOZ.91.CKA360AB000XB700: | |
| PNOZ yh1/yo1/yio1 (with semiconductor outputs) | |
| - myPNOZ.03.CKA360AB000XD700: | |
| PNOZ yh1/yo1/yio2 (with relay outputs) | |
| ▶ Optical sensor O300.GP.2-11246332: | Z9000039 |
| please order 2 sensors per infeed magazine | |

Accessories

- | | |
|---------------------------|---------|
| ▶ e.g. straight cable 5 m | 533 121 |
|---------------------------|---------|


Solution with safe small controller PNOZmulti 2

- ▶ Economical: all base units PNOZmulti 2 can be used.
- ▶ Open and flexible: all other application-based safety functions can also be monitored (E-STOP, safety gates etc.).
- ▶ Productive: the integrated diagnostics via PVIS with plain text messages enables the fast rectification of standstills with clear handling instructions.
- ▶ Saves costs: monitoring of several cardboard magazines possible with only one base unit, you configure one function block and use two sensors for each magazine.


Solution with modular safety relays myPNOZ

- ▶ Can be ordered preconfigured with the myPNOZ Creator type code
- ▶ Plug and play: wired – ready for immediate use
- ▶ Simple: diagnostics via LEDs
- ▶ Flexible: monitoring of additional safety functions possible


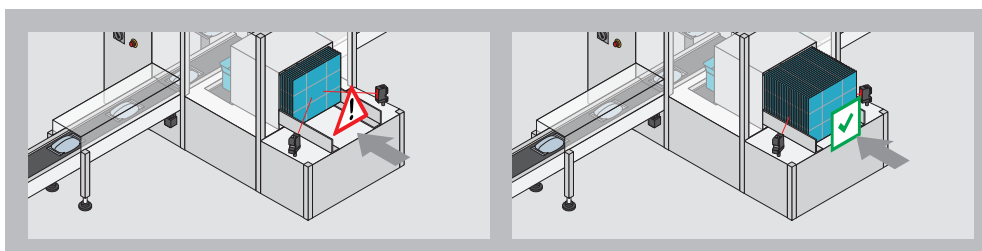
PNOZmulti 2:

 Webcode:
web225263

myPNOZ:

 Webcode:
web229570

Optical sensors:

 Webcode:
web230900
Online information
at www.pilz.com

Solution for safe monitoring of the cardboard feed –
a tool to increase the safety and productivity of your packaging machines!

► The world's first UL-certified Type 3 safety light curtains PSENopt II

NEW



The safety light curtains PSENopt II Type 3 are the first in the world to receive certification from the global test organization Underwriters Laboratories (UL) based in Northbrook, Illinois, United States. The certification confirms that the light curtains meet the national safety standards of the United States and Canada. This is beneficial for you as a machine builder, especially if you export to these markets. Furthermore UL certification supports you as a company or user with introducing products and systems into the North American market. This ultimately benefits the end user, as commissioning can take place more quickly.

The safety light curtains PSENopt II Type 3, launched in 2016 as a world first for this safety category, make it straightforward to implement applications with PL d in accordance with EN ISO 13849-1. This saves money because the application does not need to be overdesigned.

Complete one-stop solution

Together with safe control technology from Pilz, and especially the small controllers PNOZmulti 2, PSENopt II



Your benefits at a glance

- Certified safety: safety light curtains Type 3 in accordance with EN IEC 61496-1/-2 for applications up to PL d with UL and TÜV certificate
- For finger, hand and body protection, available as Type 3 but also Type 4 safety light curtains
- User-friendly diagnostics via LEDs to reduce downtimes

units provide a safe and economical one-stop solution for your plant. Flexible use, rapid installation, no dead zones and 50 g shock resistance mean PSENopt II are predestined for use in the rugged everyday industrial environment. They can be connected directly to the decentralized input

module PDP67 using the 5-pin connector. High-grade accessories such as post protectors, mirror columns and PSENopt II lockout guarantee trouble-free use.



Safety light curtains – the world's first UL-certified Type 3 light curtains PSENopt II


PSEN opII3F-s-14-030



Body protection



Hand protection



Finger protection

Type	Common features			Order number
	<ul style="list-style-type: none"> ▶ Compliant and certified in accordance with EN IEC 61508 and EN IEC 61496-1/-2: Type 3 ▶ For applications up to PL d (EN ISO 13849-1) and SIL CL 2 of EN IEC 62061 ▶ Resolution: <ul style="list-style-type: none"> - 14 mm (finger protection) - 30 mm (hand protection) - 170 or 300 mm (body protection) ▶ Operating range: <ul style="list-style-type: none"> - 0.2 ... 8 m (finger protection) - 0.2 ... 18 m (hand protection) - 0.2 ... 15 m or 10 ... 55 m (body protection) ▶ Height of protected field: <ul style="list-style-type: none"> - 150 ... 1 800 mm (finger and hand protection) - 450 ... 1 500 mm (body protection) ▶ No dead zones (except with protected field height 150 mm) ▶ Supply voltage: 24 VDC ▶ Connection: <ul style="list-style-type: none"> - Receiver: 1 x pigtail, M12, 5-pin - Transmitter: 1 x pigtail, M12, 5-pin ▶ Dimensions: 35 x 40 mm ▶ For response times see documentation ▶ Coding "Code A", "Code B", "not coded" ▶ Simple wiring 			
Selection ¹⁾	Resolution	Height of protected field	Range	
PSEN opII3B-s-170-120	170 mm	1 200 mm	0.2 ... 15 m	632 104
PSEN opII3B-s-300-120	300 mm	1 200 mm	10 ... 55 m	632 114
PSEN opII3H-s-30-060	30 mm	600 mm	0.2 ... 18 m	632 023
PSEN opII3H-s-30-090	30 mm	900 mm	0.2 ... 18 m	632 025
PSEN opII3F-s-14-015	14 mm	150 mm	0.2 ... 8 m	632 040
PSEN opII3F-s-14-030	14 mm	300 mm	0.2 ... 8 m	632 041

¹⁾ Please view the full range online at www.pilz.com, e.g. in the E-Shop.

The light curtains PSENopt II are naturally also available for Type 4 applications.



Resistant to shock, vibration and collision.



Resistant to cold (down to -10 °C).



Resistant to dust.

High level of robustness to minimize downtimes: shock-resistant to 50 g.

Webcode:
web150418

Online information
at www.pilz.com

► Safe protection zone monitoring, even for robotic applications: PSEnradar and PNOZmulti 2

NEW

The new radar sensor PSEN rd1.2 and the new analysis unit PSEN rd1.x I/O are now available for safe protection zone monitoring in rugged application conditions. Thanks to the high safety category Cat. 3/PL d, not only outdoor applications and areas in wood and metal processing are safeguarded, but now also robot applications. With the new self-teaching background function, changes can now be made within the warning or protection zone during operation without requiring a new configuration.



Dust



Rain



Steam

The safe radar system together with the configurable safe small controllers PNOZmulti 2 offers a safe complete solution for protection zone monitoring – including conformity assessment. Additional interfaces such as Ethernet and PROFIsafe also enable simple use, e.g. in retrofit applications.



Your benefits at a glance

- High safety category Cat. 3/PL d enables safeguarding of robotic applications
- High flexibility thanks to optimized sensor alignment and individual protection zone configuration
- Openness for retrofit applications thanks to additional interfaces
- Insensitive to dust, dirt, rain, light, flying sparks, steam and vibrations
- Protection against encroachment from behind to prevent the machine restarting when there are people in the danger zone



Safe protection zone monitoring, even for robotic applications: PSENradar and PNOZmulti 2

PSEN rd1.x I/O
analysing unit

PSEN rd1.1 sensor



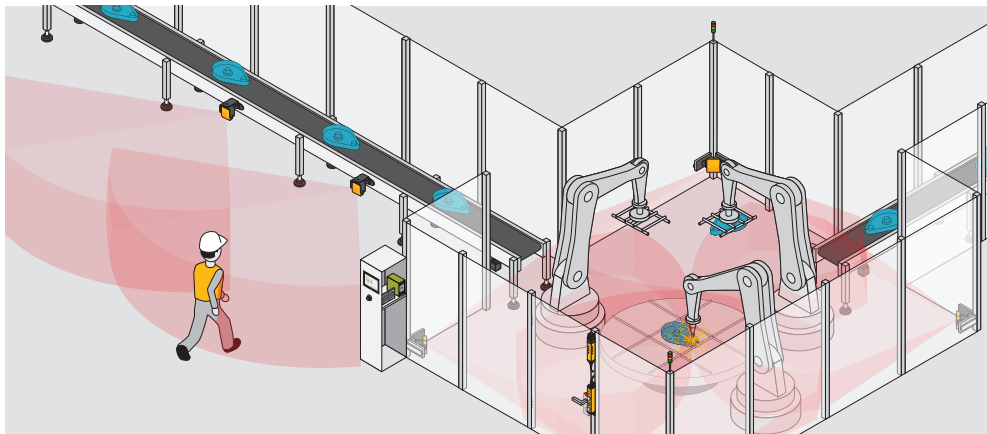
PSEN rd1.2 sensor



PNOZ m B0



Type	Common features	Order number
PSEN rd1.x I/O analysing unit	<ul style="list-style-type: none"> ▶ Series connection: up to 6 sensors ▶ Zone sets: up to 32 ▶ OSSD outputs: up to 4 ▶ Reaction time: max. 100 ms ▶ Connection type: USB ▶ Dimensions (H x W x D) in mm: 103 x 105 x 58 	6B000005
PSEN rd1.1 sensor	<ul style="list-style-type: none"> ▶ Opening angle: 110° horizontal, 30° vertical (wide) or 50° horizontal, 15° vertical (narrow) ▶ Operating range: 4 m ▶ Frequency: 24 GHz ▶ Protection type: IP67 ▶ Can be used in applications up to SIL 2(IEC 61508), PL d (EN ISO 13849-1), category 3 if 2 sensors are used ▶ Dimensions (H x W x D) in mm: 125 x 165 x 53 	6B000002
PSEN rd1.2 sensor	<ul style="list-style-type: none"> ▶ Opening angle: 20 – 100° horizontal, 20° vertical, configurable in 10° steps ▶ Operating range: 5 m ▶ Frequency: 60 GHz ▶ Protection type: IP67 ▶ For use in applications up to <ul style="list-style-type: none"> - SIL 2 (IEC 61508) - PL d (EN ISO 13849-1) - Category 3 ▶ Dimensions (H x W x D) in mm: 135 x 158 x 105 	6B000003
Accessories	<ul style="list-style-type: none"> ▶ PSEN rd1.1 sensor shield kit ▶ Cable/CA/M12-5AFX/A/005/XXXX/SH ▶ Cable/CA/M12-5AFX/A/010/XXXX/SH ▶ Cable/CA/M12-5AFX/A/015/XXXX/SH ▶ Cable/CA/M12-5AFX/M12-5AM/A/003/XXXX/SH ▶ Cable/CA/M12-5AFX/M12-5AM/A/005/XXXX/SH ▶ Cable/CA/M12-5AFX/M12-5AM/A/010/XXXX/SH ▶ Cable/CA/M12-5AFX/M12-5AM/A/015/XXXX/SH ▶ Connector/CA/M12-5SMX/A/TR ▶ PNOZ m B0 	6B000004 C1000044 C1000045 C1000046 C1000047 C1000048 C1000049 C1000050 C1000058 772 100

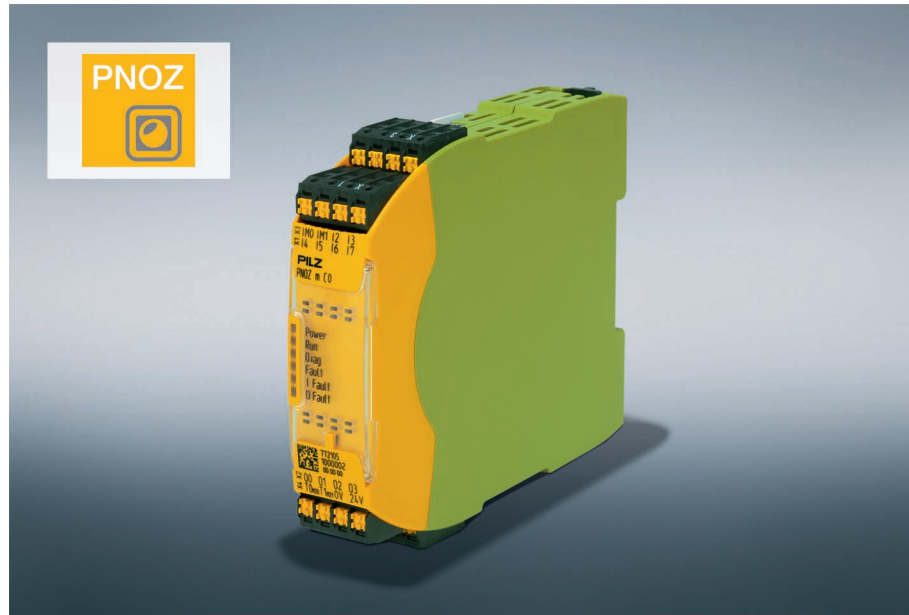
Safe complete solution with safeguarding of danger zones
and protection against encroachment from behind (restart interlock).

► Safe small controllers PNOZmulti 2 – standalone base unit PNOZ m C0

NEW



Small, but packs a punch! The new standalone base unit from the small controllers PNOZmulti 2 product range offers plenty of functions in a compact housing. 8 safe inputs and 4 safe semiconductor outputs over a width of 22.5 mm monitor safety functions on small machines. Depending on the application, you can reach PL e or SIL CL 3. Create your safety circuit using the software tool PNOZmulti Configurator. There are no license costs to pay and it gives you access to a whole bundle of approved software blocks. Whether emergency stop, safety gate monitoring, light curtain or two-hand operation, see for yourself how the software tool PNOZmulti Configurator realizes your safety requirements simply, flexibly and intuitively. The safety configuration only takes a few clicks. You can use PNOZmulti regardless of the machine type, plant type, country or branch of industry. If the number of safety functions on your machine rises, you can migrate to the modular expandable base units: PNOZ m B0, PNOZ m B0.1 or PNOZ m B1. Even after 20 years on the market, you still say “Many functions – One solution!”



Your benefits at a glance

- Maximum flexibility: Inputs and outputs can be freely configured in the software tool PNOZmulti Configurator
- Large bundle of software blocks for monitoring safety functions up to PL e/SIL CL 3
- Customized costs: as narrow as a safety relay, as powerful as a programmable safety system
- Create safety architecture and use it independently of the controller
- Saves lots of space in the control cabinet due to the compact design



Configurable safe, small controllers PNOZmulti 2 – standalone base unit PNOZ m C0



PNOZ m C0

PNOZ m C0
DetailPNOZmulti
Configurator**Technical features**

- ▶ Standalone base unit, not modular and expandable
- ▶ Can be configured in PNOZmulti Configurator from Version 11.1
- ▶ 8 safe inputs, up to 2 can be configured as auxiliary outputs
- ▶ For the connection of safe sensors PSEN, E-STOP pushbuttons, two-hand pushbuttons, safety gate limit switches, start buttons, light curtains, scanners, enabling switches, operating mode selector switches, and many more
- ▶ 4 safe semiconductor outputs, depending on the application up to PL e and SIL CL 3
- ▶ 2 test pulse outputs, both of which can be configured as standard outputs
- ▶ LED for: error messages, diagnostics, supply voltage, output circuits, input circuits
- ▶ Monitoring of shorts across contacts by means of test pulse outputs at the inputs
- ▶ Monitoring of shorts between the safety outputs
- ▶ Supply voltage: 24 VDC
- ▶ Safety circuit can be transferred directly to the unit via a USB cable and stored directly there, or alternatively on the chip card
- ▶ Safety-related characteristic data: depending on the application, up to PL e of EN ISO 13849-1 and up to SIL CL 3 of EN IEC 62061
- ▶ Certifications: CE, TÜV; others in progress (EAC (Eurasia), KOSHA, cULus listed)
- ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 120

Order number

PNOZ m C0	772 105
▶ Plug-in spring-loaded terminals	751 004
▶ Plug-in screw terminals	750 004

Optional accessories

▶ Mini USB cable	
- 3 m	312 992
- 5 m	312 993
▶ Chip card (x 1)	
- 8 kByte	779 201
- 32 kByte	779 211

Safe small controllers PNOZmulti 2 – overview of base units



PNOZ m C0 – the compact option
8 inputs,
4 semiconductor
outputs, not modular
and expandable



PNOZ m B0 – the universal option
20 inputs,
4 semiconductor
outputs, can be
expanded with
max. 6 I/O modules



PNOZ m B0.1 – for small to medium-sized applications
As PNOZ m B0, can
be expanded with
max. 1 I/O module



PNOZ m B1 – for large projects
Can be expanded
via max. 12 safe
I/O modules and
1 standard output
module



PNOZ m B1 burner – for industrial burner management
As PNOZ m B1,
additional special
burner management
function block



PNOZmulti 2
base units:

Webcode:
web2253511

Software tool
PNOZmulti
Configurator:

Webcode:
web2253441

Online information
at www.pilz.com

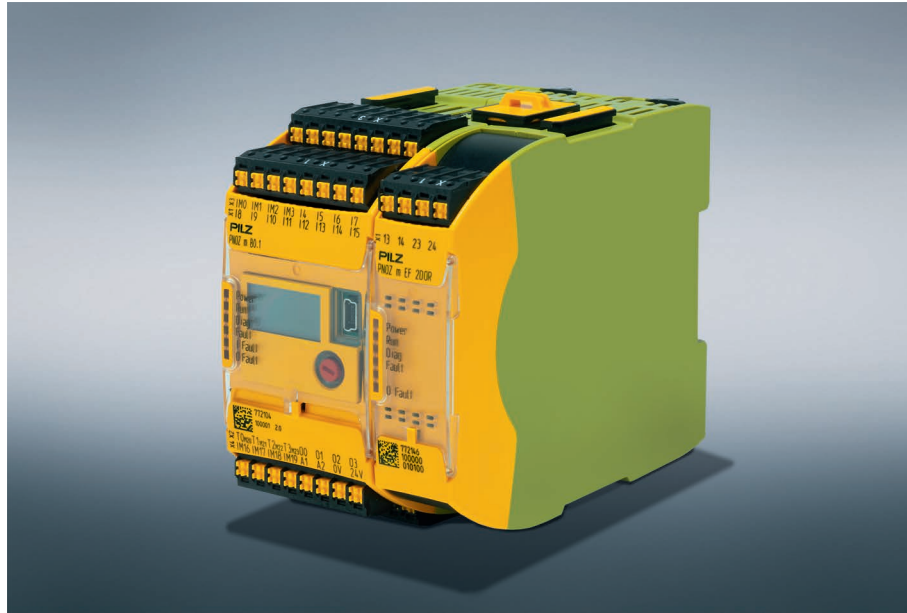
- Can be expanded with safe link modules, communication and fieldbus modules.
For further technical details please refer to the technical catalog PNOZmulti,
link at www.pilz.com, Webcode: web225256

► Safe small controllers PNOZmulti 2 – modular for simple applications

NEW



Do you need to monitor a moderate number of safety functions on your machine? The new base unit PNOZ m B0.1 can be used as a stand-alone or modularly expanded with max. one I/O module. For expansion on the right side, it is possible to select from these I/O modules: PNOZ m EF 16DI or PNOZ m EF 8DI4DO or PNOZ m EF 8DI2DOT or PNOZ m EF 4DI4DOR or PNOZ m EF 4DI4DORD or the new relay output module PNOZ m EF 2DOR. This is a compatible successor to the compact controllers PNOZmulti Mini. Existing PNOZmulti Mini projects can be easily migrated to the PNOZ m B0.1 from Version 11.0 of the software tool PNOZmulti Configurator. To the left, link modules for the connection of decentralized input modules PDP or for the networking of several PNOZmulti 2 systems can be used. Fieldbus modules are used for the connection of a higher level PLC. This results in a cost-optimized system for the safety of your machines.



Your benefits at a glance

- Safe operation through certified hardware and convenient, intuitively operated software tool
- Customized costs: exact adaptation to your application, ideal for small and medium-sized machines
- Cost-effective and sustainable: worldwide safety standard for many automation environments and communication systems
- Just one system from planning to maintenance
- Maximum flexibility: inputs and outputs are freely configurable
- Reduced downtimes thanks to user-friendly diagnostics with plain text display



Configurable safe small controllers PNOZmulti 2 – PNOZ m B0.1 and PNOZ m EF 2DOR



PNOZ m B0.1



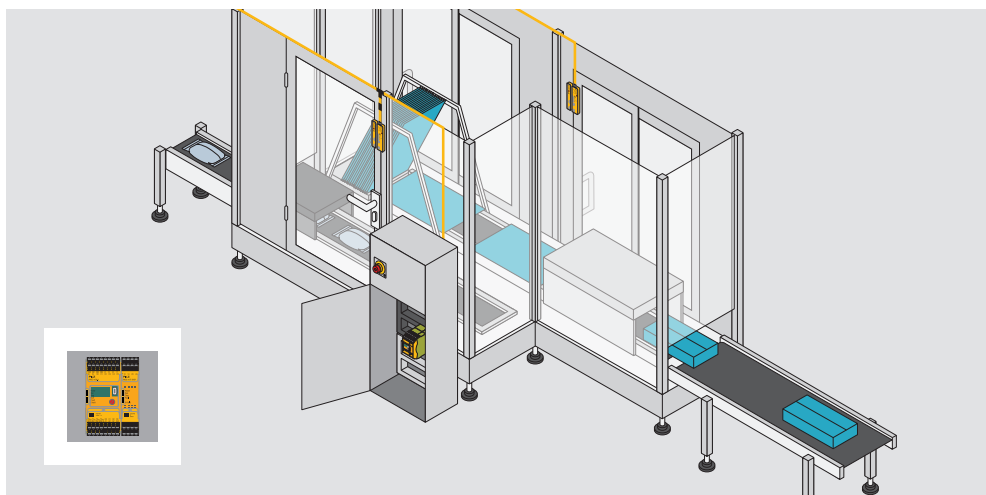
PNOZ m EF 2DOR

PNOZmulti
ConfiguratorTechnical
features

- ▶ PNOZ m B0.1: base unit, can be expanded to the right with one module
 - 20 safe inputs, up to 8 can be configured as auxiliary outputs
 - 4 safe semiconductor outputs, depending on the application up to PL e, SIL CL 3
 - 4 test pulse outputs, up to 4 of which can be configured as standard outputs
 - Right side max. 1 safe expansion module: PNOZ m EF 16DI or PNOZ m EF 8DI4DO or PNOZ m EF 8DI2DOT or PNOZ m EF 4DI4DOR or PNOZ m EF 4DI4DORD or PNOZ m EF 2DOR
 - Left side: max. 4 safe link modules PNOZ m EF Multi Link and/or PDP Link; max. 1 fieldbus module; max. 1 communication module PNOZ m EF ETH or RS232
 - Display with backlighting to indicate the status of the supply voltage and the inputs and outputs
 - Rotary knob for menu control
 - Chip card as storage medium (not supplied with device)
 - Dimensions (H x W x D) in mm: 101.4/98¹⁾ x 45 x 120
- ▶ PNOZ m EF 2DOR: safe relay output module
 - 2 safe relay outputs, depending on the application up to PL e, SIL CL 3
 - Dimensions (H x W x D) in mm: 101.4 x 22.5 x 120
- ▶ Certifications: CE, TÜV, cULus Listed, EAC (Eurasia), KOSHA
- ▶ Can be configured using the software tool PNOZmulti Configurator from Version 11.0

Order number

PNOZ m B0.1	772 104
▶ Plug-in spring-loaded terminals	751 008
▶ Plug-in screw terminals	750 008
▶ Mini USB cable	
- 3 m	312 992
- 5 m	312 993
▶ Chip card 8 kByte	
- 1 piece	779 201
▶ Chip card 32 kByte	
- 1 piece	779 211
PNOZ m EF 2DOR	772 146
▶ Plug-in spring-loaded terminals	751 004
▶ Plug-in screw terminals	750 004

PNOZmulti 2
base units:
 Webcode:
web2253511
¹⁾ Height incl. plug-in spring-loaded terminals/screw terminalsPNOZmulti 2
expansion
modules:
 Webcode:
web225352
PNOZmulti
Configurator:
 Webcode:
web2253441
Accessories
PNOZmulti 2:
 Webcode:
web87010
Online information
at www.pilz.com

By selecting the appropriate expansion modules and thanks to the simple configuration, you can expand your application easily and economically. If your application is larger than planned, it is possible to easily migrate from PNOZ m B0.1 to PNOZ m B0 or B1.

► Safe small controllers PNOZmulti Configurator – new full version 11

NEW



Version 11.0 of the software tool PNOZmulti Configurator is the newest full version in a long line from the success story of the small controllers PNOZmulti, in which the software tool played a major role. Version 11 builds upon a new software architecture with higher performance based on the Windows 64-bit system. The software tool thus offers state-of-the-art safety and continues to act as a benchmark for safety software.

The major innovation in Version 11 is the considerable streamlining of the product range: it includes all second generation base units such as PNOZ m B0, PNOZ m B1, PNOZ m B1 Burner as well as the new base unit PNOZ m B0.1. All PNOZmulti 2 expansion modules, including the new PNOZ m EF 2DOR, can also be found. Version 11 is used to create new PNOZmulti 2 projects and to open and edit existing projects. Powerflow, diagnostics, error stack etc. remain available for commissioning and maintenance. There were also significant changes to the licensing: there are no license costs for the Basic version of the software tool, so it can be downloaded and used in automation projects free of charge.



Your benefits at a glance

- Higher performance due to new software architecture, compatible with Windows 64-bit
- Basic version of the software tool can be used free of license costs
- Equipped for safe automation of the future with the latest PNOZmulti 2 product range

Version 11 will be continuously updated to include new PNOZmulti 2 hardware and software features. PNOZmulti Configurator thus remains the benchmark for safety software and the success story continues!

For functional safe monitoring of the operating mode, the new "MSO flex LED" element is available for the configuration of button

illumination to indicate the operating mode. These can be adapted individually and enable high flexibility in use.



Software tool PNOZmulti Configurator – Version 11.0 and Version 10.14

PNOZmulti
Configurator

PNOZ m B0.1



PNOZ m EF 2DOR

Technical
features

Version 11.0

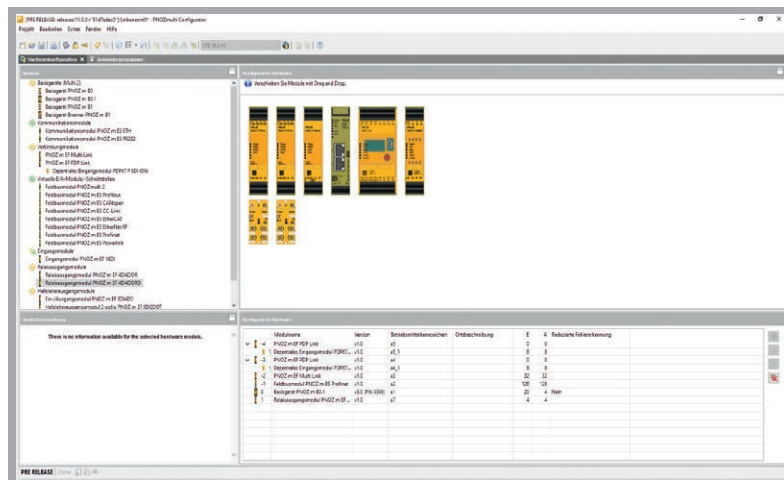
- ▶ Create, open, edit PNOZmulti 2 projects
- ▶ Contains PNOZmulti 2 hardware
- ▶ New licensing model: no license costs for Basic version. Advanced functions will be made available in later versions and will require a license.
- ▶ Element/block MSO flex LED for the configuration of operating mode indicators as a supplement to "MSO flex/flex visu" elements. The element can be freely configured.
- ▶ Base unit PNOZ m B0.1 and safe relay output module PNOZ m EF 2DOR for a convenient switchover by means of migration from PNOZmulti Mini to PNOZmulti 2

Version 10.14, long-term-supported version (released July 2021)

- ▶ Contains hardware from the PNOZmulti 2, PNOZmulti Classic and PNOZmulti Mini product ranges
- ▶ This version can be used to migrate PNOZmulti Classic or Mini projects to PNOZmulti 2
- ▶ Open, edit existing PNOZmulti 2/Classic/Mini projects, create new projects

Order number

PNOZ m B0.1	772 104
▶ Plug-in spring-loaded terminals	751 008
▶ Plug-in screw terminals	750 008
PNOZ m EF 2DOR	772 146
▶ Plug-in spring-loaded terminals	751 004
▶ Plug-in screw terminals	750 004

PNOZmulti
Configurator:
 Webcode:
web2253441
PNOZmulti 2
base units:
 Webcode:
web2253511
PNOZmulti 2
expansion
modules:
 Webcode:
web225352
Online information
at www.pilz.com

Flexible to use and simple to operate. Version 11 is a slimmed down version with PNOZmulti 2 hardware and is available to download free of license costs!

► Safe motion – new motion monitoring functions for drive-integrated safety!

NEW



The new safety card PMCprotego S3 expands the drive-integrated solution to include new motion monitoring functions in accordance with EN 61800-5-2: SDI-M, SLI-M, SLS-M, SOS-M, SLP-M, SSR-M, SRL and SSO. This allows the application-specific error response to be adapted so flexibly that the highest productivity of the plant is achieved in each case under the most varied safety requirements. Using safe and fast communication with real-time Ethernet SafetyNET p RTFL, the safe motion solution is directly connected to safe small controller PNOZmulti 2 and also enables safe cross-communication between the drives. Benefit from short response times and reduce the work and costs related to hardware by switching from I/O components to safe communication. For fast commissioning, the engineering tool PASmotion offers not only parameterization of the safety card but also configuration of the servo amplifiers and motion controller in one tool.



Your benefits at a glance

- Higher productivity thanks to new motion monitoring safety functions with the flexibility to adjust the error reaction
- SafetyNET p RTFL enables short response times and reduces the wiring work
- Compact size thanks to drive-integrated solution
- Flexible configuration and fast commissioning thanks to the clear software tool
- Open drive solution independent of motor types and feedback systems
- Complete engineering and one-stop services: risk assessment, safe motion concept, hardware/software design, setting parameters, programming and commissioning



Safety card PMCprotego S3



PMCprotego S3



PASmotion



SDI-M



SLI-M



SLS-M



SOS-M



SLP-M



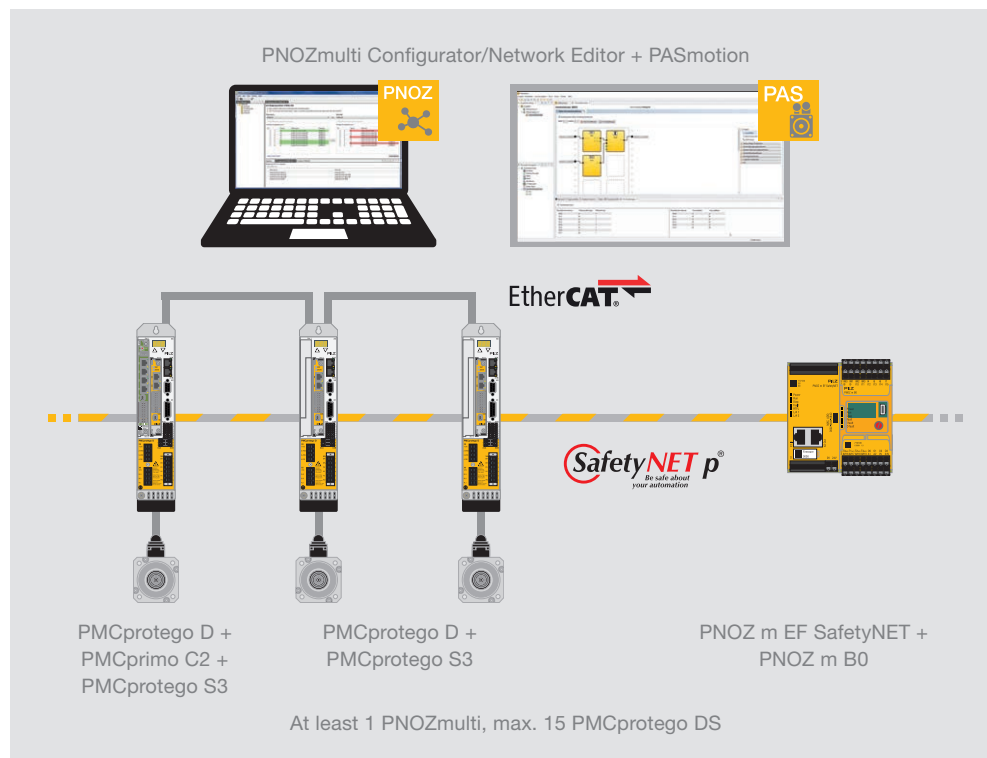
SSR-M

Technical features

- ▶ Safe motion monitoring functions (in acc. with EN 61800-5-2):
 - Safely monitored direction (SDI-M)
 - Safely monitored increment (SLI-M)
 - Safely monitored speed (SLS-M)
 - Safely monitored operation stop (SOS-M)
 - Safely monitored position (SLP-M)
 - Safely monitored speed range (SSR-M)
- ▶ Safety functions:
 - STO, SS1, SS2, SOS, SLS, SSR, SDI, SLI, SBC, SBT, SLP
- ▶ Further functions:
 - Safe reset lock (SRL)
 - Safe status output (SSO)
- ▶ Safety level: up to SIL CL 3 (EN IEC 62061), PL e/Cat. 4 (EN ISO 13849-1)
- ▶ Configurable I/O: 8 FDI/6 FDO
- ▶ SafetyNET p RTFL: 2 x RJ45
- ▶ SafetyNET p inputs/outputs: 32 I/O
- ▶ Network devices: up to 16
- ▶ Data exchange (cross-communication): 3 connections
- ▶ Encoder interface: Mini I/O
- ▶ Encoder: Incremental TTL, absolute encoder SSI
- ▶ SBC: 2 dual-pole digital outputs (FDO)
- ▶ Configuration tool: PASmotion 1.4.0

Order number

- ▶ PMCprotego S3 680 010



SafetyNET p RTFL network: Safe motion PMCprotego DS and safe small controller PNOZmulti 2

► I/O module with protection type IP67 and PROFINET/PROFIsafe

NEW

Flexible and modular automation solutions require I/O systems that enable personnel protection directly at the danger zone. The new PDP67 PN with PROFINET/PROFIsafe interface is the ideal solution for safety outside the control cabinet. Thanks to its robust design with protection class IP67, it can be installed directly at the machine. This saves space in the control cabinet and enables modular plant designs. Thanks to universal connections that can be configured as both inputs and outputs, users only need to stock one unit type. This saves space in the warehouse! The PDP67 PN can be integrated into the network of the remote I/O system PSSUniversal 2 from Pilz as well as into any other PROFINET/PROFIsafe networks.

The PDP67 PN is thus the cost-efficient, fast and flexible solution for decentralized monitoring of safety and non-safety-related sensor and actuator technology in environments with extreme temperatures.



Your benefits at a glance

- Compatible with various third-party devices through the PROFINET/PROFIsafe interface
- Supplements our remote I/O systems PSSUniversal 2 and PDP67 product ranges
- Flexible configuration of the connections as safe inputs or outputs
- Great potential savings with wiring, as connection of a sensor to the PDP67 module replaces the entire input wiring to the control cabinet
- Short commissioning times and minimum service costs thanks to M12 plug-in connectors
- More space in the control cabinet, as the IP67 modules are positioned outside
- IP67 protection: Robust from -30°C to $+70^{\circ}\text{C}$ thanks to die cast zinc housing
- Simple installation and flexible I/O configuration directly where safety is required on the machine
- AIDA pinning (Automation Initiative of German Domestic Automobile Manufacturers)



Decentralized field devices



PDP67 PN 6FDI
6FDIO 2FDOTP



µSD memory card
512 MB M12A



IP67 labels



Caps for L-coded
connections



Caps for IP67
modules

**Technical
features**

- ▶ PROFINET/PROFIsafe device (slave)
- ▶ 6 safe digital inputs (2 inputs at one connection)
- ▶ 6 safe digital inputs and outputs
(flexible configuration: 2 inputs or 2 outputs at one connection)
- ▶ 2 safe digital 2-pin outputs (1 output at one connection)
- ▶ Sensor and actuator connection: M12, 5-pin connections
- ▶ Protection class: IP67
- ▶ Housing: die cast zinc
- ▶ Certifications: CE, TÜV, CCC (UL to follow)
- ▶ Ambient temperature: -30 °C to +70 °C
- ▶ Operating voltage: 24 VDC
- ▶ Functional safety: PL e, SIL CL 3

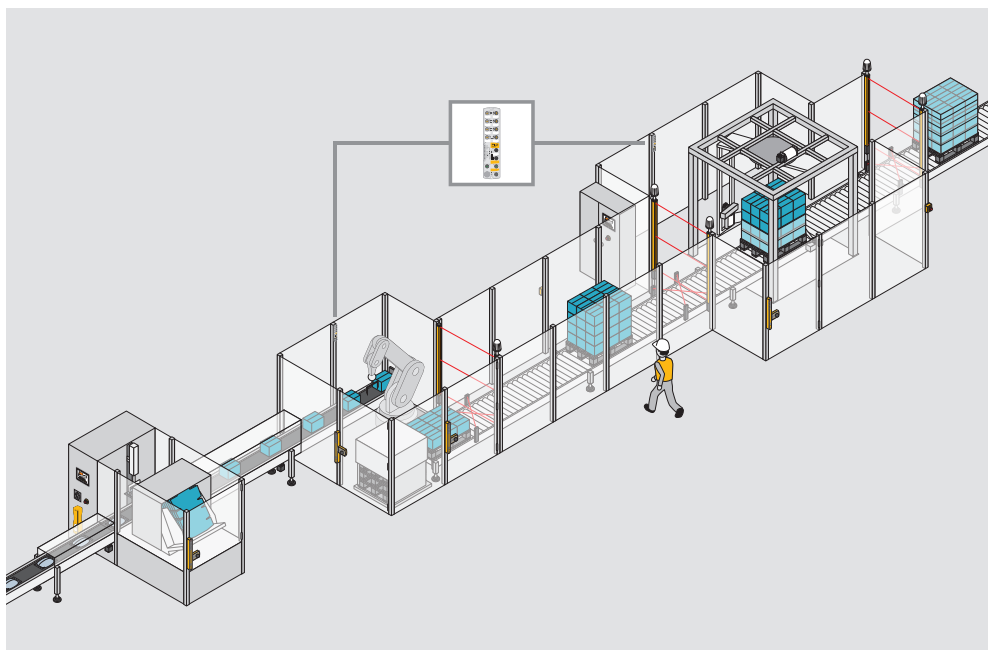
Order number

PDP67 PN 6FDI 6FDIO 2FDOTP

4R000001


Accessories

- | | |
|--------------------------------|----------|
| ▶ µSD memory card 512 MB M12A | 4R000002 |
| ▶ IP67 labels | C1000033 |
| ▶ Caps for L-coded connections | 380 328 |
| ▶ Caps for IP67 modules | 380 324 |



Modular machines require safety directly at the danger zone.
The I/O module PDP67 PN for PROFINET/PROFIsafe makes this possible.

IP67 modules:

 Webcode:
web150450

Online information
at www.pilz.com

► Safe automation of AGVs

NEW

We make your automated guided vehicle system safe! The safety laser scanner PSENscan delivers surface monitoring and the provision of data for the navigation of mobile platforms. Adjustment of the dynamic protected field is performed by directly analyzing the encoder inputs in the laser scanner. When combined with the modular safety relay myPNOZ and the control and signal devices PITestop and PITsign, you get a cost-optimized solution thanks to the mutually compatible components. The open interfaces also offer maximum flexibility when it comes to your individual mobile platform. The Security Bridge ensures that no one can access the internal IT network of the mobile platform without authorization during operation. As well as safe automation, we also have a comprehensive package of services enabling us to help you with the safe operation of automated guided vehicles.







Your benefits at a glance

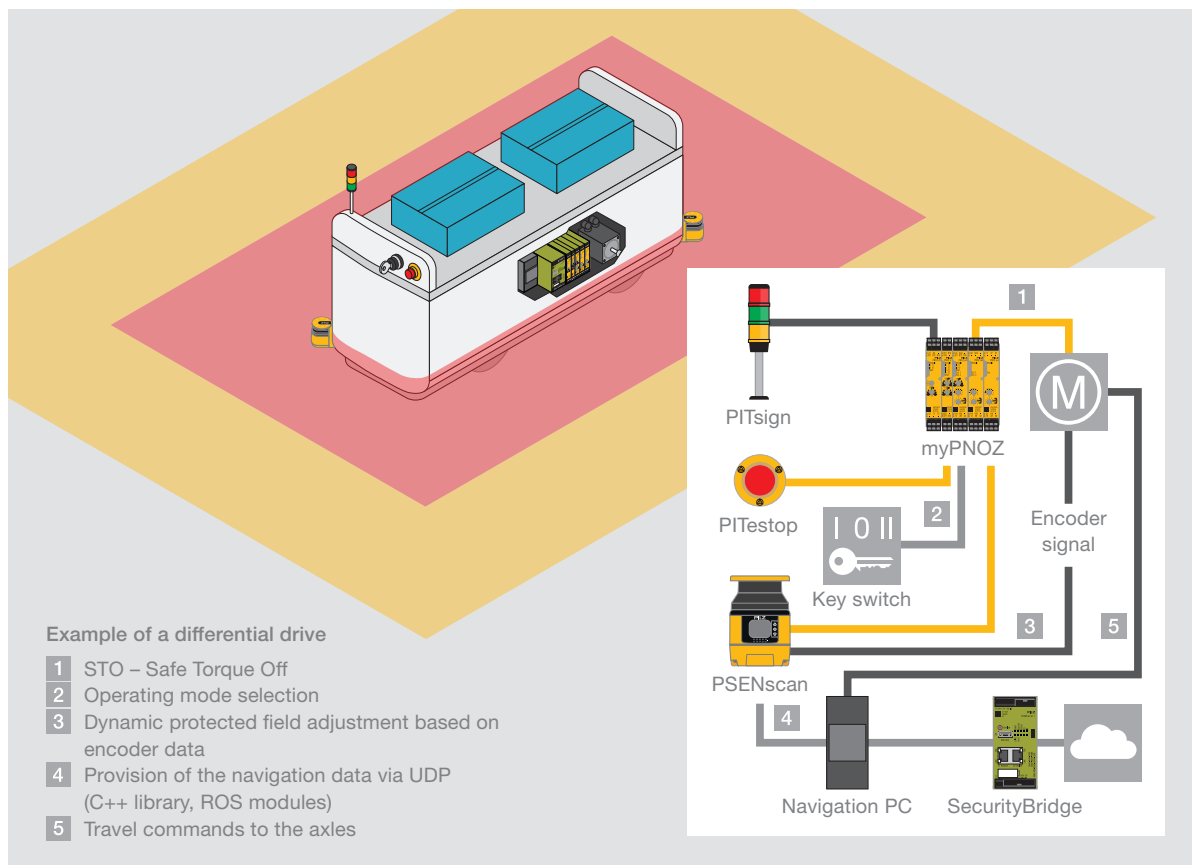
- Compliance of the AGV system application with the requirements of ISO 3691-4
- Complete one-stop safety solution saves time and money
- Rapid integration of the navigation data from the laser scanner PSENscan via UDP
- Time saving thanks to dynamic protected field adjustment, which is performed by directly evaluating the encoder inputs in the laser scanner
- International conformity assessment, e.g. CE marking for AGV systems and for the entire application where necessary, as well as training and consulting



Example of a safe and flexible solution for differential drives

Type	Features	Order number
 PSENscan	PSENsc ME 5.5 08-17 Master encoder model for surface monitoring and the provision of data for navigation via C++ library and ROS ¹⁾ interface: compliant and approved in accordance with EN IEC 61496-1, Type 3, EN ISO 13849-1, PL d/Cat. 3, IEC 61508: SIL 2, series connection master for up to 3 subscribers, up to 4 encoder inputs	6D000034
 myPNOZ	myPNOZ.73.CKA360EB640XA445AA058AC011 Plug-and-play with the preconfigured safety relay	
 Security Bridge	PCOM sec br1 PCOM, Security Bridge, VPN server for establishment of a VPN tunnel, supports X.509 certificates	311 501
 PITestop/PITsign	PITes1s PITestop E-STOP pushbutton IP65, with E-STOP symbol and logo, mounting hole: 22.3 mm PIT si3.1 indicator light unit PITsign indicator light unit red, yellow, green including LED, housing: IP65, for signalling various operating and plant statuses	400 131 581 190

¹⁾ Free download of the ROS modules: https://github.com/PilzDE/psen_scan_v2



www.pilz.com/en-EN/services/safety-of-automated-guided-vehicles



Further information about intralogistics solutions:
www.pilz.com/intralogistics

► Safe operation of AGVs

NEW



Your requirements

As an operator or manufacturer of automated guided vehicles (AGVs) or systems (several AGVs), you are bound by the specifications of ISO 3691-4. This defines the requirements for safety functions and specifies how the automated functions of the vehicles are to be validated. It specifies the required performance level for the vehicle monitoring functions, various operating modes and the brake control. When using one or several AGVs, you must make sure that your system is not only safely designed but is also safely and above all productively used, taking all local conditions into account.

Our services

We take a holistic view of your AGV application. We get involved as early as the development of system concepts in the design phase and support your projects up to commissioning. This helps us to ensure that safety and productivity are guaranteed in the operation of your automated guided vehicle systems.



Your benefits at a glance

- You save time and money with us as your safety and automation partner for the complete application.
- We guarantee that your applications meet the requirements of ISO 3691-4. If necessary, we provide confirmation of this through the Conformity Assessment Procedure.
- We check the AGV safety starting in the earliest stages of the procurement process. This helps you to avoid additional costs and save time.
- We ensure that maximum safety is achieved whilst using only the functionally necessary components.
- Ideal supplement for a safe solution: our safety laser scanner PSENscan detects objects in the vehicle's path and provides maximum safety even at high speeds, without compromising productivity. The perfect solution for the use of automated guided vehicles.




We make your AGV application safe. In every way possible!

Benefit from our complete package:

Design Risk Assessment (DRA)	Optional factory acceptance test at the manufacturer's site (FAT)	Site Acceptance Test (SAT)
<ul style="list-style-type: none"> ▶ Review of the risk assessment from the AGV manufacturer (on-site or remotely) ▶ Check of key design features with regard to the use of AGV ▶ Check of compliance with standards and regulations/ guarantee of compliance of the AGV with the legal requirements ▶ You will receive the following results from us: <ul style="list-style-type: none"> - Design Risk Assessment (DRA) for the AGV system based on the design drawings as well as your information for the use of the AGV - AGV Design Review Report - List of necessary/recommended measures for increasing safety and productivity 	<ul style="list-style-type: none"> ▶ Detailed validation of the most important safety functions of an AGV ▶ You will receive the following documents from us: <ul style="list-style-type: none"> - Detailed report of the factory acceptance test - List of necessary/recommended measures for increasing safety and productivity <p>This service is also interesting for AGV manufacturers. We offer consultancy on specific safety functions for navigation, control and braking or on speed monitoring and we provide you with the corresponding certificate of compliance for your customers.</p>	<ul style="list-style-type: none"> ▶ Complete risk assessment of the entire AGV system application ▶ Check of all/selected AGVs that are in use ▶ Validation of the complete AGV system application incl. examination of the environment ▶ Consultancy on all necessary measures for the users on-site ▶ You will receive the following documents from us: <ul style="list-style-type: none"> - Risk assessment - Site Acceptance Test report - List of measures

Training

We offer a training course giving a comprehensive insight into the correct operation of AGV systems in the workplace. You will receive all the information you need to know about the key requirements regarding the safety of AGV systems – also available as an in-house training course.

 Webcode:
web229656

Online information
at www.pilz.com

► CEFS – Certified Expert in Functional Safety

NEW



Expert

The CEFS – Certified Expert in Functional Safety course gives you expert knowledge of functional safety of machines that you can put to immediate use.

The course provides comprehensive information about the corresponding EN ISO 13849 and EN IEC 62061 standards and a practical approach to the creation of complex safety systems. CEFS is aimed at people who already have prior knowledge in the field of functional safety.

Upon successful qualification, you will be able to create and assess safety systems yourself – from design through verification to implementation and validation. CEFS includes a series of course works in which you will learn how to apply particular topics in practice.



Your benefits at a glance

- The course provides comprehensive expert knowledge of functional safety in technical depth.
- You will learn how to successfully validate functional safety systems.
- We will show you how to select the most effective and cost-efficient control system that is ideally suited to your requirements.
- You will receive detailed information on how complex safety systems can be designed in conformity with EN ISO 13849 and EN IEC 62061.
- The compact design of the course and content built on prior knowledge enables certification within just two days.
- After passing the test, you are issued a certificate from TÜV NORD that verifies your qualification. The certificate is recognized worldwide and entitles you to use the designation “CEFS – Certified Expert in Functional Safety”.



CEFS – Certified Expert in Functional Safety

Contents	<p>Basic knowledge of functional safety</p> <ul style="list-style-type: none"> ▶ Basics of safety control systems ▶ Application and implementation of Performance Level (PL) and Safety Integrity Level (SIL) ▶ Safety requirement specification ▶ Course work 1 “Producing a safety requirement specification” <p>Designing a safety control system</p> <ul style="list-style-type: none"> ▶ Safety circuit architectures ▶ Preventing and controlling systematic failures ▶ Course work 2 “Division into subsystems” ▶ Course work 3 “Determining the probability of a random hardware failure” ▶ Course work 4 “Checking the systematic requirements, including safety-related software” <p>Validating a safety circuit</p> <ul style="list-style-type: none"> ▶ Creating a validation plan and protocol ▶ Course work 5 “Designing a validation protocol” ▶ Using software tools for validation ▶ Course work 6 “Software-based review of the safety level” <p>Expert knowledge of functional safety</p> <ul style="list-style-type: none"> ▶ Special cases ▶ Solution-oriented exercise “Practical application of functional safety” ▶ Requirements and implementation of a corporate functional safety management system
Target groups	<p>CEFS is aimed in particular at machine manufacturers, design engineers and integrators with special responsibility with regard to safe control systems. Furthermore, CEFS is specially intended for people who are responsible for machinery safety of new and existing machines in day-to-day operations, such as:</p> <ul style="list-style-type: none"> ▶ Design engineers ▶ Programmers of safe control systems ▶ Project engineers ▶ System integrators ▶ Test engineers who are responsible for the validation of machinery

Your best path to qualification

CEFS is at the highest level of our international qualification program, the expert level. With the relevant professional experience or participation in training courses from the previous levels, you have a structure for building your expert knowledge. Depending on your professional experience and level of knowledge, we therefore recommend completing the training courses listed on the right in order. Just jump in at the appropriate level.



- Introduction: Introduction to Machinery Safety
- Fundamental: Fundamentals of Machinery Safety
- Advanced: Safety Design Incorporating EN ISO 13849 and EN IEC 62061
- **Expert: CEFS – Certified Expert in Functional Safety**

Webcode:
web202195

Online information
at www.pilz.com

Support

Technical support is available from Pilz round the clock.

Americas

Brazil

+55 11 97569-2804

Canada

+1 888 315 7459

Mexico

+52 55 5572 1300

USA (toll-free)

+1 877-PILZUSA (745-9872)

Asia

China

+86 21 60880878-216

Japan

+81 45 471-2281

South Korea

+82 31 778 3300

Australia and Oceania

Australia

+61 3 95600621

New Zealand

+64 9 6345350

Europe

Austria

+43 1 7986263-0

Belgium, Luxembourg

+32 9 3217570

France

+33 3 88104003

Germany

+49 711 3409-444

Ireland

+353 21 4804983

Italy, Malta

+39 0362 1826711

Scandinavia

+45 74436332

Spain

+34 938497433

Switzerland

+41 62 88979-32

The Netherlands

+31 347 320477

Turkey

+90 216 5775552

United Kingdom

+44 1536 462203

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

+49 711 3409-222

support@pilz.com

Pilz develops environmentally-friendly products using ecological materials and energy-saving technologies. Offices and production facilities are ecologically designed, environmentally-aware and energy-saving. So Pilz offers sustainability, plus the security of using energy-efficient products and environmentally-friendly solutions.



Presented by:



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PILZ
THE SPIRIT OF SAFETY