

► Configurable safe small controllers PNOZmulti 2



You can use the configurable safe small controllers PNOZmulti 2 for safety-related shutdown of plant and machinery safely and in compliance with the standards up to PL e of EN ISO 13849-1 and SIL CL 3 of EN/IEC 62061, irrespective of the machine type, plant type, country or industry. PNOZmulti 2 ensures a controlled and therefore safe stopping of a movement and is used for position monitoring or for interrupting a movement when the user intervenes.

Independent and can be standardised

You create your safety architecture for the plant-dependent safety functions and independently of the higher-level plant control. Once user programs have been created, they can be flexibly adapted and reused again and again. This provides benefits in terms of time and cost savings that lower your engineering costs from project planning to maintenance.

Modular and flexible

PNOZmulti 2 is a modular system and is comprised of a base unit plus expansion modules. The modular structure is as flexible as your application. Safe analogue input modules, dual-pole output modules, motion monitoring modules and many more offer extensive possibilities for implementing state-of-the-art safety applications.



PNOZ m B1



PNOZ m B1 Burner



PNOZ m B0

Base units PNOZmulti 2 – the basis for your application

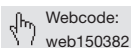
The base units are only 45 mm wide and have an illuminated display.

- PNOZ m B1 – for large-scale projects. No inputs or outputs on the base unit, number of I/Os can be controlled via expansion modules. With 2 integrated ETH interfaces and Modbus/TCP on board
- PNOZ m B1 Burner – specifically for applications in industrial burner management
- PNOZ m B0 – the universal option. With on-board inputs and outputs

Your benefits at a glance

- Certified hardware and software for reliable operation
- Easy to configure thanks to user-friendly software tools
- Short time-to-market as the inputs and outputs are freely configurable
- The appropriate modules for every requirement – flexible, simple, economical to expand
- Comprehensive diagnostic options mean short downtimes
- Fast commissioning thanks to simple wiring with plug-in terminals
- Maximum safety – up to PL e and SIL CL 3, depending on the application

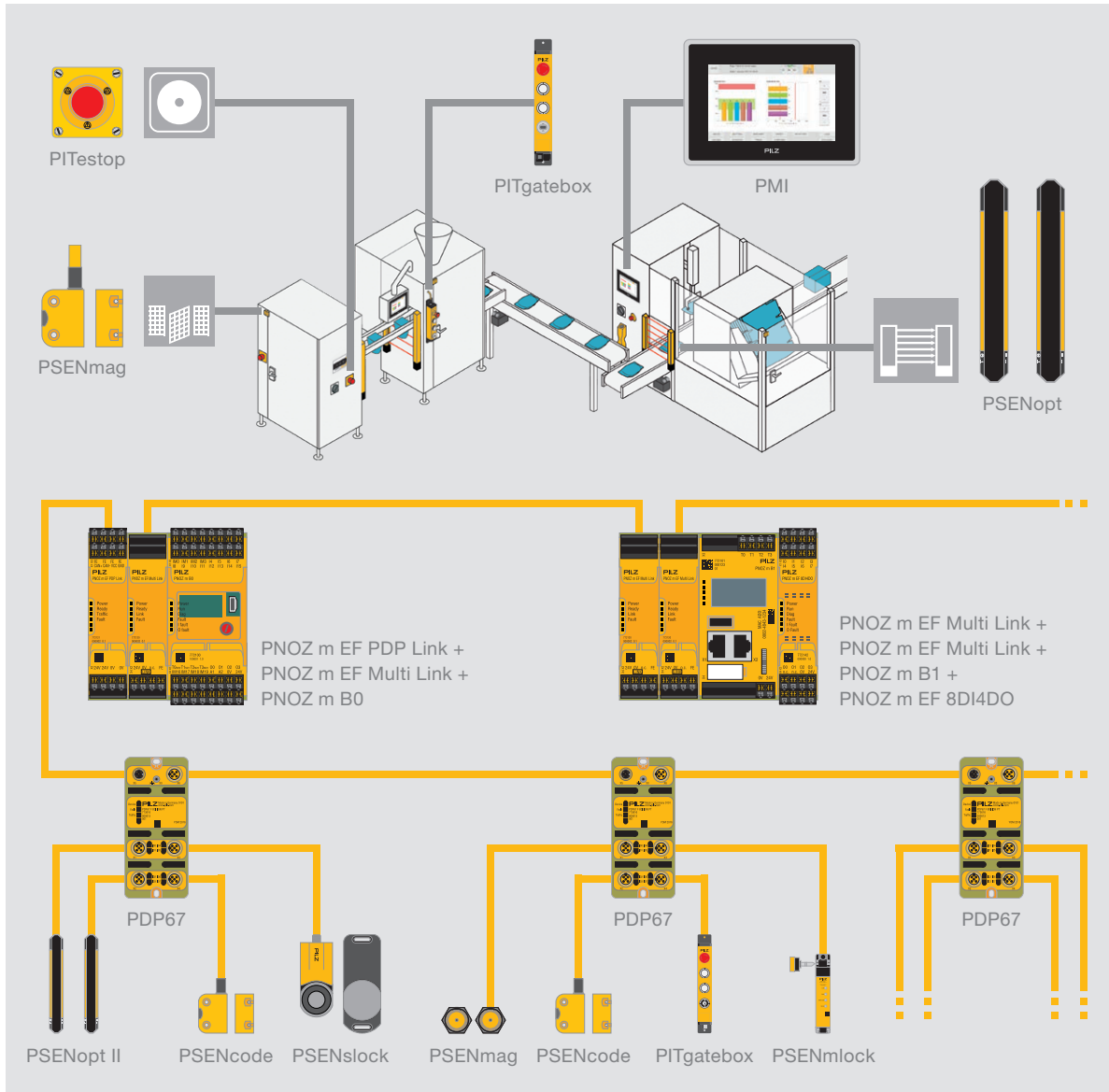
Base units
PNOZmulti 2:
technical features
from page 86



Webcode:
web150382

Online information
at www.pilz.com

– the success story continues!



The decentralised modules PDP67 can be connected to the PNOZmulti 2 via a link module – for cost-effective, simple, decentralised expansion. Multi-link modules are also available for networking several base units.

Decentrally in the field

The PDP link module serves as the interface for the decentralised modules PDP67 (to protection type IP67) to the base unit. The signals from the connected sensors are directly forwarded to the PDP link module from the field for further processing. With up to 16 PDP67 modules on one base unit, the number of sensors that can be connected increases by 64. This is what an economical solution looks like!

Complex tasks – a team effort

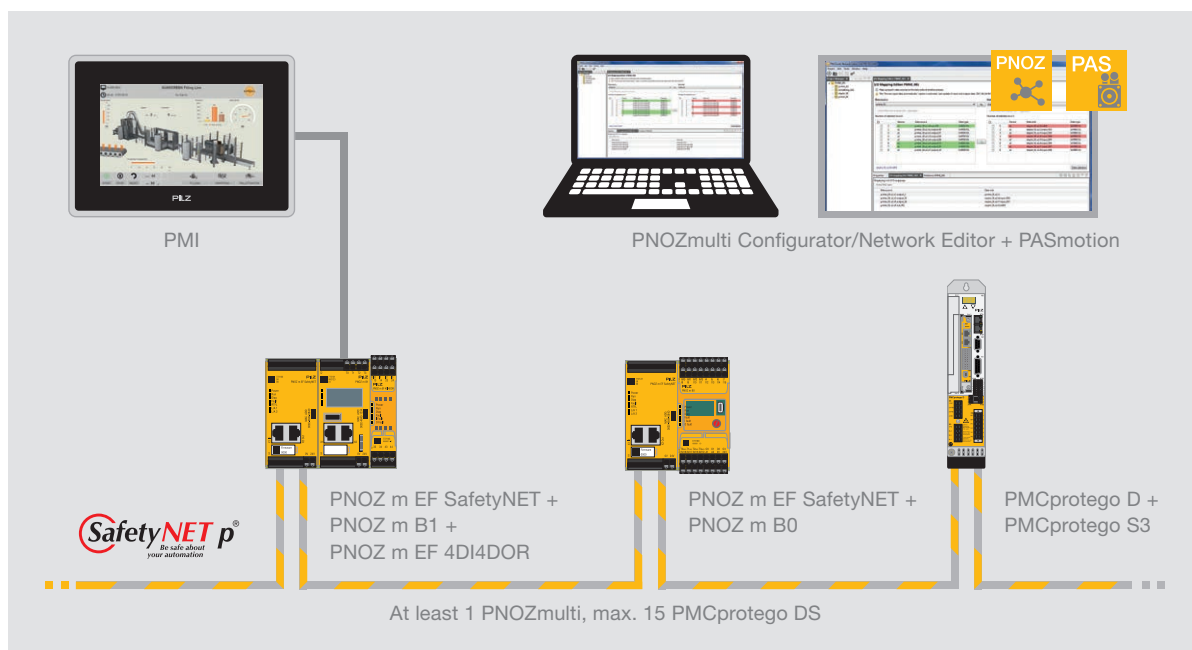
The multi-link module enables simple, safe data exchange between several base units. Thanks to the modular structure of the PNOZmulti 2, different topologies can be implemented on one base unit with up to four link modules. As a result, users can connect several PNOZmulti units to implement safety functions for complex plant and machinery.

Keep up-to-date on configurable safe small controllers PNOZmulti 2:

Webcode:
web150500

Online information at www.pilz.com

► Safe communication via SafetyNET p RTFL



Safe communication via the real-time Ethernet SafetyNET p RTFL with PNOZmulti 2 and safe motion solution PMCprotego DS. This is also possible as a purely PNOZmulti 2 network with up to 16 subscribers.

For complex plant and machinery

You can now link up to 16 base units via the safe real-time Ethernet SafetyNET p RTFL. Use the expansion module PNOZ m EF SafetyNET to achieve this. 32-bit data is exchanged via RTFL for short scan times in practice. A clearly structured data interface where the inputs are configured with 128 bit and the outputs with 32 bit characterises the data link. PNOZmulti Network Editor is used for configuration of a SafetyNET p network and for project linking. It is called up directly from the PNOZmulti Configurator and can interlink variables of the input or output image of PNOZmulti projects. After upload into the PNOZmulti systems, the SafetyNET p network is ready to use.

Safe drive solutions in the system

You can build the system out of only PNOZmulti 2 base units (PNOZ m B0 or B1) or integrate the safe motion solution PMCprotego DS in the SafetyNET p network. PMCprotego DS is composed of the servo amplifier PMCprotego D and the safety card PMCprotego S3. The end result is a safe drive solution in conjunction with PNOZmulti 2. This monitors the drive solution and ensures the movement is stopped in a controlled and therefore safe manner.

Your benefits at a glance

- Safe communication via the real-time Ethernet SafetyNET p
- Fast RTFL communication with short scan times
- Up to 16 PNOZmulti systems in linear topology with easy networking with the PNOZmulti Network Editor
- Combination of PNOZmulti 2 and safe motion solution PMCprotego DS for a safe drive solution

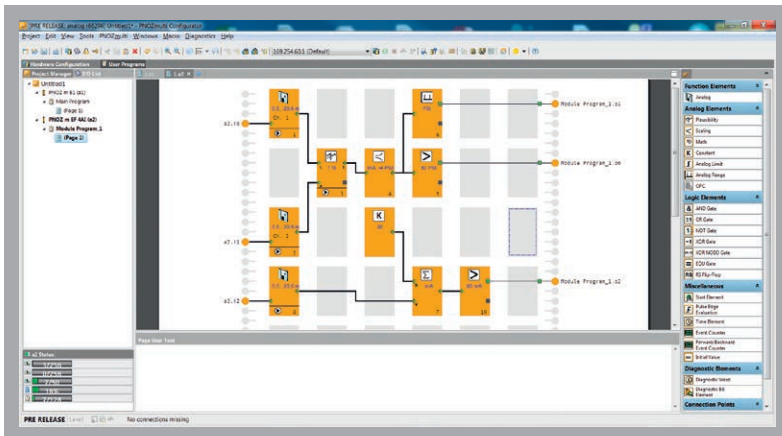
Technical details
on SafetyNET p
module from
page 92:

Webcode:
web150393

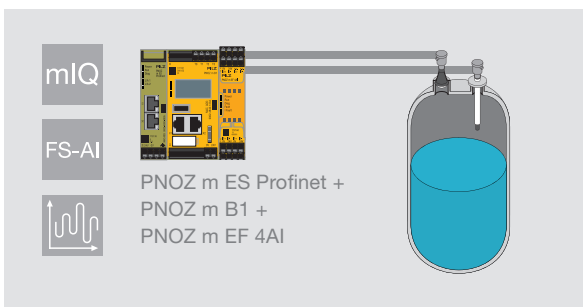
Online information
at www.pilz.com

► Monitoring analogue input signals safely

The analogue input module PNOZ m EF 4AI provides four independent safe analogue current inputs. The inputs are suitable for connecting transducers or encoders with standardised current signals. Any measured variables such as pressure, temperature, fill level, distance etc. can be safely recorded. Elements/blocks are available in the software tool PNOZmulti Configurator with which you can parametrise limit values and range monitoring with a few clicks of the mouse. In addition, you can already scale the analogue measurement values in numerical quantities with any unit during the configuration. Arithmetic functions such as averaging, differential pressure calculation and similar facilitate its use for special applications. In combination with the visualisation software PASvisu, analogue values can be displayed and evaluated. The analogue input module is suitable for many varied possible applications, in particular for the industries of process engineering and cable car and chair lift design.



Configurable safe small controllers PNOZmulti 2: simple configuration of analogue functions in the software tool PNOZmulti Configurator in a separate module program. Benefit: fast project planning thanks to new software blocks for input, feasibility, scaling and arithmetic functions with fine adjustment of the values. Quick and easy commissioning is possible thanks to the dynamic program display.



Fill level measurement application

This example application shows the safe sensing of the fill level using a chemical tank as an example. Monitoring is performed with PNOZmulti 2 base unit PNOZ m B1 and analogue module PNOZ m EF 4AI. Two non-safety-related sensors are connected to the analogue module. The limit value and hysteresis are monitored. The two sensors are compared.

Your benefits at a glance

- Safe and precise monitoring of process values: up to PL e, SIL CL 3
- Fast, simple project planning: new software blocks for input, feasibility, scaling and arithmetic functions
- Limit value and range monitoring can be parametrised
- Fast reaction times: module program technology mIQ with decentralised processing in the module
- User-friendly diagnostics: up to 6 analogue values can be transferred to the fieldbus for each module
- Play it safe and use PNOZmulti 2 – the worldwide safety standard for all machine types

Keep up-to-date on configurable safe small controllers PNOZmulti 2:

Webcode:
web150500

Technical details from page 88. You can find a video tutorial on the configuration on our YouTube channel.

Webcode:
web150385

Online information at www.pilz.com

► For safe monitoring of your drives

Safe motion monitoring modules

The safe motion monitoring modules PNOZ m EF 1MM/2MM for the configurable safe small controllers PNOZmulti 2 ensure safe monitoring of your drives. Together with a base unit PNOZ m B0 or PNOZ m B1 the expansion modules monitor one or two axes. You can easily configure the safe motion monitoring modules for PNOZmulti 2 using the software tool PNOZmulti Configurator. In the tool you can then also configure a separate module program (mIQ), which is then run directly on the motion monitoring module. This brings significant benefits to you as the user: it's possible to have fine granular configuration of several monitoring areas, such as velocity or rotational speed, which are then executed locally on the expansion module. That means greater flexibility for you as the user. User-friendly diagnostic options and a wide range of fieldbus and communications options are also available to you.

Flexible and robust

All common incremental encoders can be connected using drive-specific connection cables via the **industry-compatible Mini I/O interface**, characterised by particularly high durability.

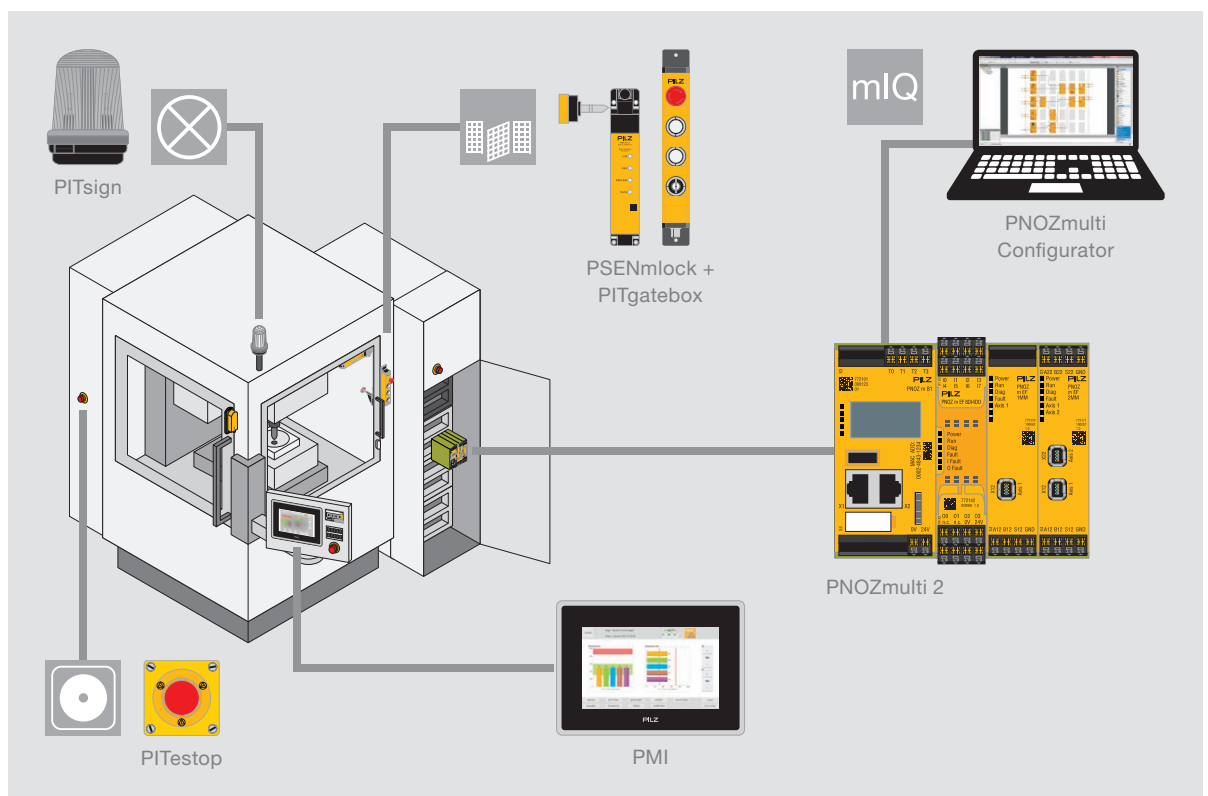
Safe motion functions in accordance with EN/IEC 61800-5-2 and safe monitoring functions

EN/IEC 61800-5-2 describes so-called "safe motion functions" that are intended to reduce risks during ongoing operation. A safe monitoring function can be considered a supplementary safety function: the monitoring function is based on the normative motion function. Exceeding of parametrised limit values is signalled and PNOZmulti 2 triggers a safe reaction in the event of a fault and if detection zones/protected areas are violated.

More information on EN/IEC 61800-5-2:

Webcode:
web200448

Online information at www.pilz.com



Accessories:

Webcode:
web87010

Online information at www.pilz.com

Safe small controllers PNOZmulti 2 with module program (mIQ) for configuration of several monitoring areas, such as velocity or rotational speed, which are then executed locally on the expansion module.

Available monitoring functions on the small controllers PNOZmulti 2

- ▶ Safe stop 1: SS1
- ▶ Safe stop 2: SS2
- ▶ Safe speed monitor: SSM
- ▶ Safe speed range: SSR-M
- ▶ Safe direction: SDI-M
- ▶ Safe operating stop: SOS-M
- ▶ Safely limited acceleration: SLA-M
- ▶ Safe acceleration range: SAR-M
- ▶ Analogue voltage (track S)

Rotary encoder PSENenco for safe motion monitoring!

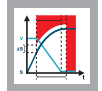
The safe incremental encoders PSENenco send position changes of a machine or machine parts, e.g. in machine tools or presses, to the evaluation device such as the small controller PNOZmulti 2. You can output and evaluate HTL or SIN/COS signals to optimise the design of your application. The high resolution enables fast reaction times and precise measurements. Together with PNOZ m EF 1MM/2MM, PSENenco offers safety functions for speed, direction, acceleration and standstill with different safety levels in the respective function. The quick and easy wiring is supported by M23 cables from Pilz.

Your benefits at a glance

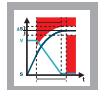
- ▶ Maximum flexibility due to the new module program technology (mIQ): can be configured with the usual simplicity in the PNOZmulti Configurator
- ▶ Fast reaction times: lightens the load on the base unit
- ▶ Simple configuration of the motion monitoring safety functions via software blocks in the PNOZmulti Configurator
- ▶ Productive plant and machinery: with PNOZmulti 2 you have reduced costs with maximum safety
- ▶ Connection to all common incremental encoders via industry-compatible interface Mini I/O

Your benefits at a glance

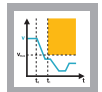
- ▶ Enables speed and position-based safety functions
- ▶ High flexibility through scalable evaluation system
- ▶ High resolution enables fast reaction times and precise measurements
- ▶ Holistic safety solution for motion and position monitoring from a single source
- ▶ Simple, fast implementation



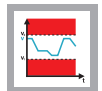
SS1



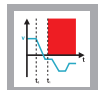
SS2



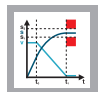
SSM



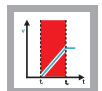
SSR-M



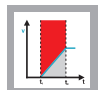
SDI-M



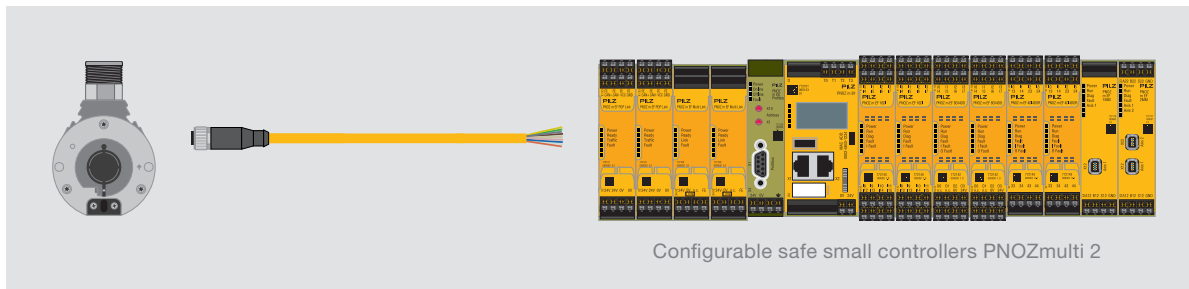
SOS-M



SLA-M



SAR-M



Configurable safe small controllers PNOZmulti 2

Together with PNOZ m EF 1MM/2MM, PSENenco offers safety functions for speed, direction, acceleration and standstill with different safety levels in the respective function.

Technical details
on the motion
monitoring modules
from page 90:

Webcode:
web150385

Online information
at www.pilz.com

► For safe press applications



Dual-pole semiconductor output module PNOZ m EF 8DI2DOT

The dual-pole semiconductor output module PNOZ m EF 8DI2DOT is available to you for the safe monitoring of mechanical presses. Two safety outputs are used to control the press safety valves or other actuators that require dual-pole switching. You can configure the eight inputs with an individual filter time to enable correct operation with a variety of input signals. Press blocks in the software tool PNOZmulti Configurator, e.g. for operating modes or monitoring functions, make it easy and economical to use. A special advantage is the option of configuring a separate module program (mIQ), which is then run locally on the module with very short cycle times of approx. 3 ms. Output control is also extremely fast, so you benefit from very short reaction times of < 8 ms.

Press elements/blocks in the software tool PNOZmulti Configurator:

- Operating modes such as setup, single-stroke, automatic
- Monitoring a mechanical rotary cam arrangement
- Run monitoring to monitor the mechanical transmission for shear pin breakage
- Monitoring of electrosensitive protective equipment in detection and/or cycle mode
- Control and monitoring of the press safety valve
- Cycle initiation via a two-hand control device

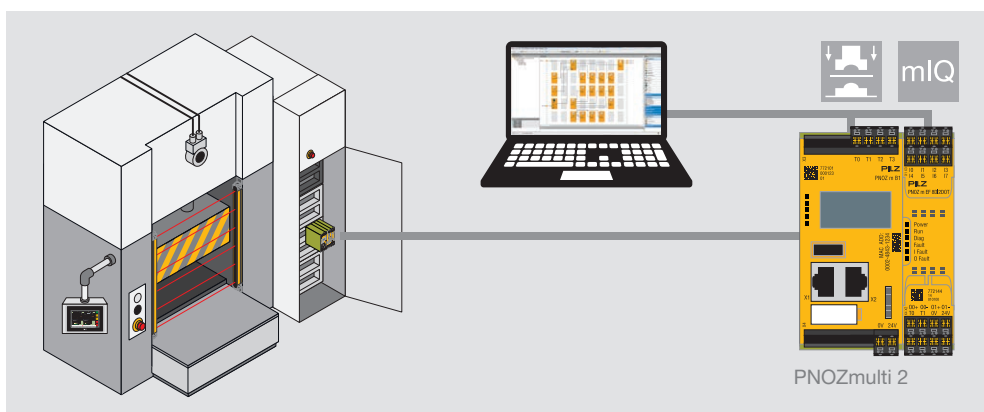
Your benefits at a glance

- Maximum safety: simple configuration of press functions using certified software blocks with module program technology (mIQ) for each module
- Rapid reaction times (< 8 ms) and short cycle times of approx. 3 ms: press application is processed directly in the module
- Fine module-specific adjustment
- Particularly well suited for retrofit thanks to narrow width
- Depending on the application up to PL e, SIL CL 3
- Play it safe and use PNOZmulti 2 – the worldwide safety standard for all machine types

Technical details from page 90:

Webcode:
web150500

Online information at www.pilz.com



Configurable safe small controllers PNOZmulti 2: Base unit PNOZ m B1 with the dual-pole semiconductor output module PNOZ m EF 8DI2DOT for configuring safe press functions. The module program technology mIQ enables particularly fast reaction times (< 8 ms) and short cycle times of approx. 3 ms.

► For applications in industrial burner management

Base unit PNOZ m B1 Burner in combination with software element "burner"

As a manufacturer of burner and heat-related plant and machinery, you must observe a number of legal and normative requirements. The safety requirements in particular are extremely stringent.

New to the range of safe small controllers PNOZmulti 2 is a base unit for the safe control and monitoring of furnaces. The base unit is configured in the software tool PNOZmulti Configurator with the burner element (function block) that reproduces the expanded functionality of a flexibly configurable electronic automatic burner control. You can thus easily configure a number of burner applications. These include various burner types, such as master burners or slave burners, direct or indirect ignition, low or high-temperature operation and much more.

Tested and certified

Our solution has been tested and certified according to the corresponding standards, including EN 298, EN 50156 and NFPA 85/86. Testing according to international standards is in preparation.

Your benefits at a glance

- Flexible and safe design of your furnace
- Saves lots of time during design and engineering as you can easily and quickly implement even complex safety applications with just one small controller
- Connection options with numerous automation environments and communication systems
- Maximum safety thanks to tested and certified hardware and software elements
- Tested and certified in accordance with EN 298, EN 50156, NFPA 85/86



Webcode:
web150382

Online information
at www.pilz.com

Configurable safe small controllers PNOZmulti 2 for monitoring and controlling your furnace. All plant-dependent safety functions such as emergency stop, limit value monitoring and many others can also be monitored and controlled.

► Access permission and operating mode selection



Access permissions with PITreader

The software tool PNOZmulti Configurator offers you an input element with which you can easily configure access permissions for plant and machinery. In combination with the base unit PNOZ m B1 and up to four reading units PITreader with RFID technology, you can implement authentications and authorisations for plant and machinery. Users can authenticate themselves on the PNOZmulti by inserting a transponder key into the read area of the PITreader; they will then be authorised to carry out certain operations. The permission on the transponder key must meet the condition for the required permission as configured. The options range from a simple enable and authentication of specific machine component functions to a complex hierarchical permission matrix. PITreader can be used flexibly as a stand-alone device or in conjunction with a controller from Pilz, in particular the base unit PNOZ m B1. PITreader and PNOZmulti 2 thus combine safety and security functions.

Your benefits at a glance

- PITreader: Control of access permissions with excellent manipulation protection
- Every user is given the machine enables that match their abilities
- Functionally safe operating mode selection up to PL d/ SIL CL 2, using the operating mode selection and access permission system PITmode in combination with PITreader



– made easy!

Functionally safe operating mode selection PNOZmulti 2 and PITreader

In addition to the access permissions, you can configure the functionally safe operating mode selection on plant and machinery with new operating mode selector elements (function blocks) in the software tool PNOZmulti Configurator. In combination with the operating mode selection and access permission system PITmode, especially the PITreader, you have two convenient solutions for the operating mode selection. The permission for selection is configured in combination with PITreader and the corresponding RFID keys. In PNOZmulti 2 the selected operating mode can be read out.



PITreader

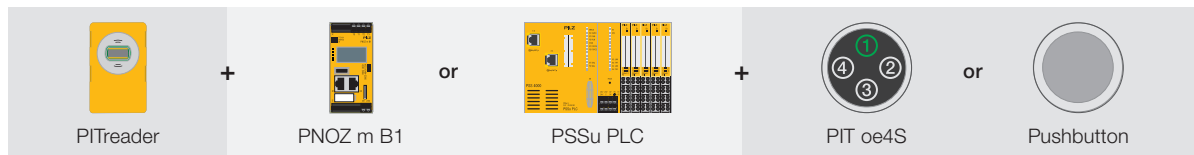


PIT oe4S



PMI v704e

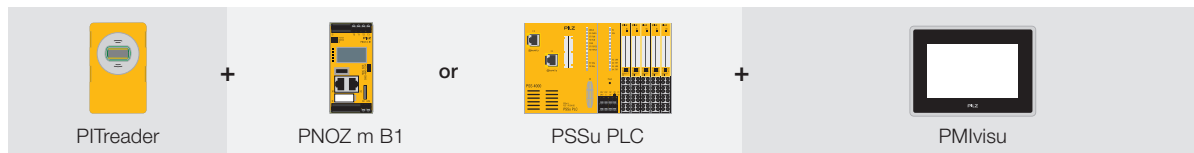
PITreader with Pilz FS controller and LED pushbutton (PITmode flex)



Operating mode selection via button:

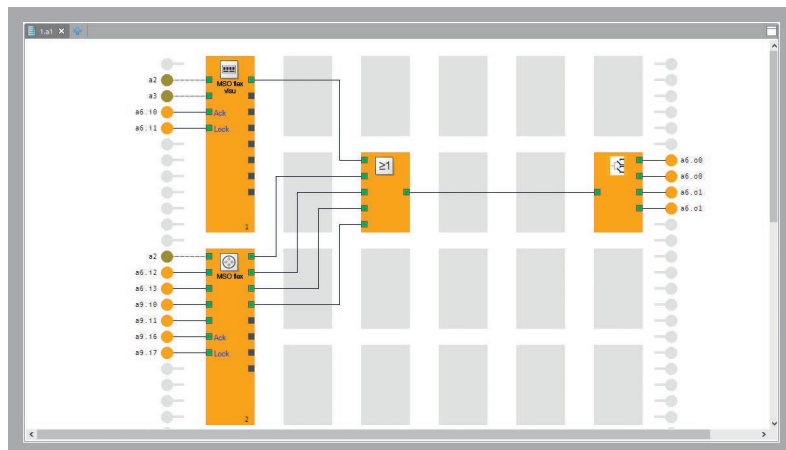
On the one hand, the operating mode can be selected via the Pilz PIT oe4S or also via conventional buttons.

PITreader with Pilz FS controller and Pilz HMI (PITmode flex visu)



Operating mode selection via touch panel:

As an alternative, safe selection of the operating mode is possible via a key field on an HMI. The operator and visualisation terminal PMI visu thus enables safe selection of the operating mode.



Monitor functionally safe operating mode selection in conjunction with small controllers PNOZmulti 2 and PITreader from the operating mode selection and access permission system PITmode! Two elements/function blocks are available in the PNOZmulti Configurator!

► The perfect combination – automation solutions

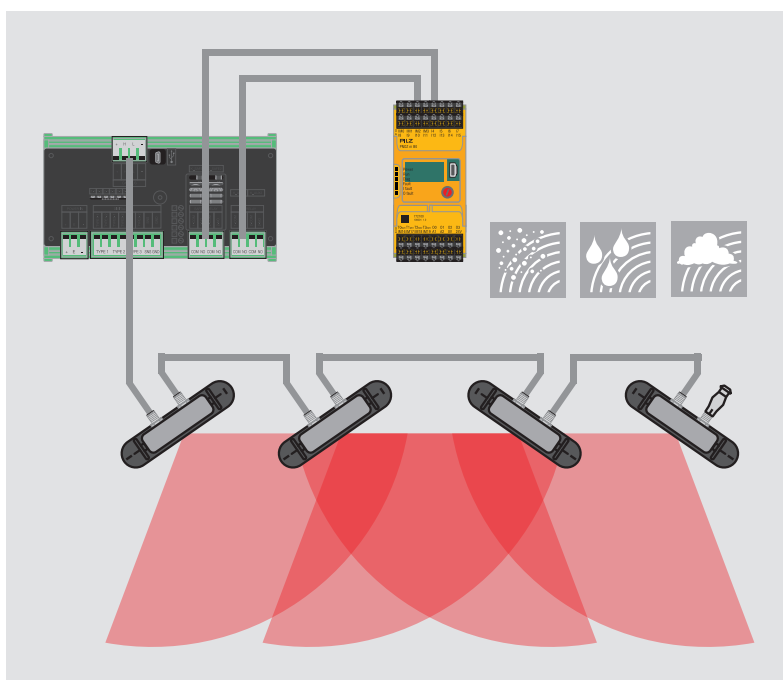
Safe sensors, operator and monitoring devices from Pilz guarantee the efficient, compliant use of plant and machinery in combination with the small controllers PNOZmulti 2. Our turnkey systems and universally compatible solutions offer a high savings potential. Our solutions can be used in almost all industries and applications.

Safe protection zone monitoring with radar technology

The world's first complete solution for protection zone monitoring based on radar technology consists of the safe LBK System radar system from Inxpect S.p.A. and the configurable safe small controller PNOZmulti 2. This complete solution enables complex applications and rugged environments to be monitored safely, even outdoors. The robust radar technology ensures high availability even where there are external influences such as dust, dirt, rain, light, sparks or steam.

Your benefits at a glance

- Series connection of up to 6 sensors
- Two protection zone configurations (narrow and wide) – depending on the size of the area to be monitored
- A Configurator is used to select the sensors and set up the protection zone
- Warning zone to signalise approaching objects
- Integral muting for the whole system or for individual sensors
- Restart interlock to prevent the machine restarting when there are people in the danger zone



Monitoring of danger zones with the LBK System from Inxpect and the configurable safe small controller PNOZmulti 2.

Additional information on the LBK System:

Webcode:
web199925

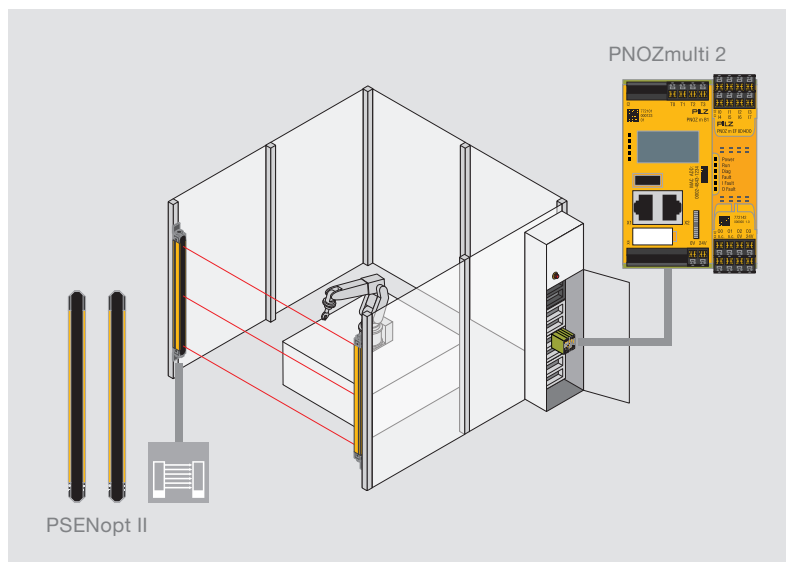
Online information at www.pilz.com



from Pilz

Safe complete solution with safety light curtains PSENopt II

The safety light curtains PSENopt II are used for safe intervention in the production process and, depending on the requirement, provide finger, hand and body protection. The first type 3 safety light curtains are specifically designed for applications up to PL d of EN/IEC 61496-1. Type 4 light curtains are also available for applications up to PL e of EN/IEC 61496-1/-2. The safety light curtains are available in the lengths of 150 mm to 1 800 mm. Combining with configurable safe small controllers PNOZmulti 2 gives you a safe, complete, one-stop solution. The compatible accessories range from fitting aids to mirror columns.



The perfect team: light curtain PSENopt II and configurable safe small controller PNOZmulti 2.

Your benefits at a glance

- ▶ Body protection versions for applications up to PL e
- ▶ Highly robust for protection against shock, collision and vibration
- ▶ User-friendly diagnostics via LEDs to reduce downtimes
- ▶ Flexible use with enhanced safety – thanks to freedom from dead zones
- ▶ Coding for greater flexibility when installing the light curtains
- ▶ Economical, complete, one-stop solution with control technology from Pilz

Webcode:
web150418

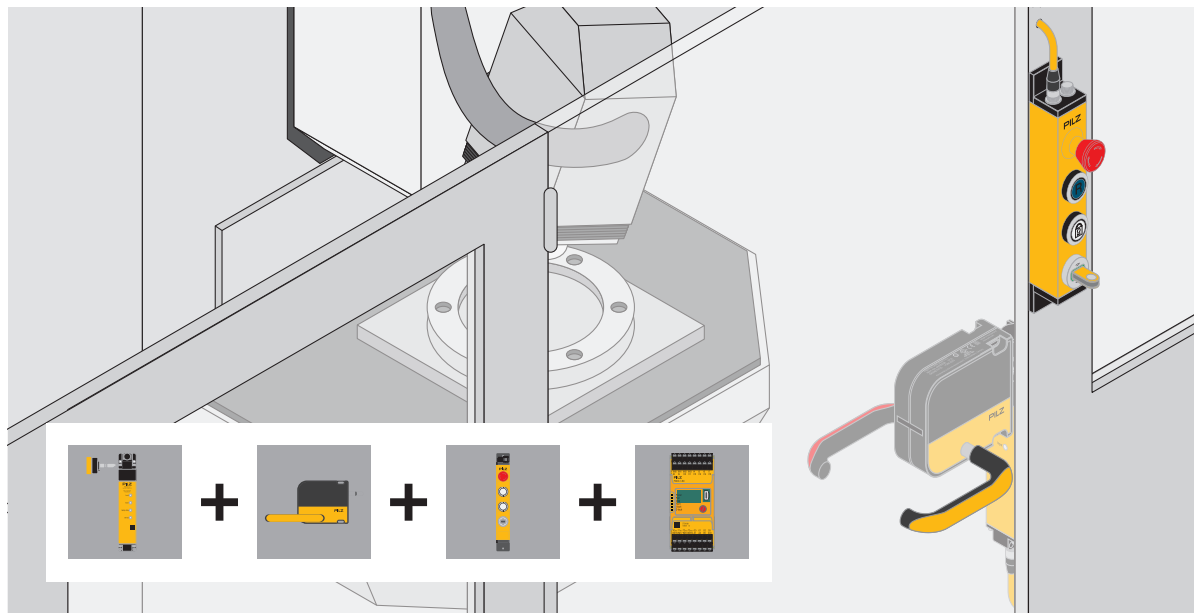
Online information
at www.pilz.com



Webcode:
web150418

Online information
at www.pilz.com

► The perfect combination – automation solutions



Modular safety gate system

The modular safety gate system offers you an individual safety gate solution that is ideally tailored to your application. That means you can combine individual components flexibly to suit your own particular requirements.

Put together your system for safety gate monitoring – optionally with access permission management.

The following components are available for selection:

- Safety gate sensor PSEnMlock for safe interlocking and safe guard locking up to PL e. Different versions are available as a base unit, for series connection and with and without power reset
- PSEnMlock handle module for accessible safety gates with integrated escape release and simple, flexible installation inside and outside of the danger zone

- Escape releases and suitable handles for the safety gate system PSEnMlock
- Pushbutton unit PITgatebox for simple operation of the safety gate system, optionally with integrated access permission system PITreader
- Safety Device Diagnostics (SDD) for comprehensive diagnostic and status information as well as for the safe series connection of safety sensors and targeted individual control of the guard locking of individual switches in the series

Combining with the configurable safe small controller PNOZmulti 2 gives you a cost-effective, complete, one-stop solution.



from Pilz

Modular safety gate system – components

Sensor	PSEnmlock (safety guard locking device) ► PSEnmlock base version (with/without auto. reset) ► PSEnmlock series connection (with/without auto. reset) 		
Handle	Handle module Integrated escape release, for swing/sliding gates	Handles For swing gates 	For sliding gates 
Escape release		Escape releases Classic escape release 	Remote escape release 
Pushbutton unit	PITgatebox¹⁾    		
Pushbutton unit with access permission system	PITgatebox with PITreader 		
Evaluation device	Configurable safe small controllers PNOZmulti 2 		
Diagnostics and targeted control	Safety Device Diagnostics 		

¹⁾ Figure shows only one selection. Additional versions are available

Additional information on the modular safety gate system:

 Webcode: web194460

Online information at www.pilz.com

Configurable safe small controllers

Firewall SecurityBridge – protect your controller

With the firewall SecurityBridge you protect the configurable safe small controllers PNOZmulti 2 against manipulation through unauthorised access. It is connected upstream of the base unit and functions as a VPN server. This banishes the spectre of espionage and manipulation, and guarantees the safety of your employees and the availability of your machinery! Further information from page 112.



 Webcode: web188268

Online information at www.pilz.com

► Configurable safe small controllers PNOZmulti 2

Configurable safe small controllers PNOZmulti 2 – base units

Common features

- Modular and expandable
- Application range: for monitoring E-STOP buttons, two-hand buttons, safety gate limit switches, light beam devices, scanners, enable switches, safety gate switches PSEN, operating mode selector switches, pressure-sensitive mats, safe motion monitoring and many other applications
- Safety-related characteristic data: depending on the application, up to Performance Level PL e/Cat. 4 of EN ISO 13849-1 and Safety Integrity Level (SIL) CL 3 of EN/IEC 62061
- Can be configured using the software tool PNOZmulti Configurator
- Exchangeable program memory
- Illuminated display for status and device information
- If the diagnostic solution PVIS is activated, it is possible to display customised texts
- Visualisation software PASvisu, with direct connection to PNOZmulti
- Supply voltage: 24 VDC
- LED status indicators
- Plug-in connection terminals: either spring-loaded terminals or screw terminals available as obligatory accessories



PNOZ m B1



PNOZ m B1 Burner



PNOZ m B0

Type	Features
PNOZ m B1	► Automation project is transferred to the base unit using a USB stick (512 MB, included) or via the integrated ETH interface: - multiple projects can be stored - only one can be executed - managed via the project manager ► Larger programs in the PNOZmulti Configurator only with PNOZ m B1: - up to 1 024 connection lines possible - macro programming not yet available - module programs (mIQ) supported ► Date and time for PNOZ m B1 can be set in the PNOZmulti Configurator ► USB stick as storage medium
PNOZ m B1 Burner	Base unit – specifically for burner management: ► Control and monitoring of furnaces, e.g. monitoring of safety sequences, combustion air pressure, ignition, flame, external compound controller and leak-tightness control ► Control of safety valves, ignition valves, exhaust valves, ignition, external compound controller and combustion air blowers
PNOZ m B0	► Automation project is transferred to the base unit using a chip card (not included, available as an accessory) or via the integrated USB interface ► 20 safe inputs, up to 8 of which can be configured as auxiliary outputs ► 4 safe semiconductor outputs, depending on the application up to PL e, SIL CL 3 ► Chip card as storage medium

technical details

	Certification	Order number		
		Without terminals	Plug-in spring-loaded terminals	Plug-in screw terminals
▶ 4 test pulse outputs for detecting shorts across contacts between the inputs, otherwise no inputs and outputs on the base unit ▶ Right side: max. 12 safe expansion modules, 1 output module for standard applications ▶ Left side: up to 4 safe link modules, max. 1 fieldbus module ▶ Modbus TCP on board ▶ Display with backlighting for diagnostics, for activating the project, Ethernet settings, for setting the date and time of the system, for stopping and starting the device ▶ Multifunction switch for menu control ▶ 2 Ethernet interfaces with switch: transmission rate 10 MBit/s, 100 MBit/s; connector type RJ45 ▶ Dimensions (H x W x D) in mm: 100 x 45 x 120.2	CE, cULus Listed, EAC (Eurasian), TÜV, KOSHA	772 101 RJ45 cable ▶ 1.5 m _____ 314 094	751 016	750 016
▶ Monitoring of the following oil and gas burner types: Master burner with direct ignition, master burner with indirect ignition and joint flame monitoring ▶ Up to 12 burner function blocks can be configured per base unit ▶ Safety-related characteristic data: depending on the application, up to Performance Level PL e/ Cat. 4 of EN ISO 13849-1 and Safety Integrity Level (SIL) CL 3 of IEC 61508 ▶ Other features: as for PNOZ m B1	CE, cULus Listed, EAC (Eurasian), TÜV, KOSHA	772 102	751 016	750 016
▶ 4 test pulse outputs, up to 4 of which can be configured as standard outputs ▶ Right side: max. 6 safe expansion modules ▶ Left side: max. 4 safe link modules, max. 1 fieldbus module and max. 1 communication module ▶ Display with backlighting to indicate the status of the supply voltage and the inputs and outputs ▶ Rotary knob for menu control ▶ Dimensions (H x W x D) in mm: 101.4/98 ¹⁾ x 45 x 120	CE, cULus Listed, EAC (Eurasian), TÜV, KOSHA	772 100 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	751 008 (1 set)	750 008 (1 set)

¹⁾ Height incl. plug-in spring-loaded terminals/screw terminals

Keep up-to-date on PNOZmulti 2 base units:

 Webcode: web150382

Online information at www.pilz.com

► Configurable safe small controllers PNOZmulti 2

Configurable safe small controllers PNOZmulti 2 – expansion modules, connectible on the right



PNOZ m EF 16DI



PNOZ m EF 4AI



PNOZ m EF 8DI4DO



PNOZ m EF 4DI4DOR

Type	Application area
PNOZ m EF 16DI	Safe input module
PNOZ m EF 4AI	Safe analogue input module
PNOZ m EF 8DI4DO	Safe input/semiconductor output module
PNOZ m EF 4DI4DOR	Safe input/relay output module

Common features

- For each expansion module PNOZ m EF 4AI, PNOZ m EF 8DI2DOT, PNOZ m EF 1MM/2MM a separate module program (mIQ) with 256 connection lines can be configured. The user program consists of a main program and one or more module programs. The module program is set up like the main program. Configuration is performed directly in the module program. Processing is decentralised and occurs in the module.

technical details

Features	Certification	Order number		
		Without terminals	Plug-in spring-loaded terminals	Plug-in screw terminals
▶ 16 safe inputs ▶ Monitoring of shorts across contacts by means of test pulse outputs at the inputs ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 120	CE, cULus Listed, EAC (Eurasian), TÜV, KOSHA	772 140	751 004 (1 set)	750 004 (1 set)
▶ 4 independent safe analogue current inputs, each input can be configured separately ▶ Current range: 4 ... 20 mA, measuring range: 0 ... 25 mA ▶ Resolution: 15 bit + sign bit; sampling rate: 10 kHz ▶ Workspace monitoring in accordance with Namur NE 43 (range limits are freely configurable) ▶ Limit value/range monitoring (limit values freely configurable) ▶ Safety-related characteristic data: depending on the application, up to PL e in accordance with EN ISO 13849-1 and up to SIL CL 3 in accordance with EN/IEC 62061 ▶ Exact analogue values can be passed on via fieldbus to a higher level controller for diagnostic purposes. Visualisation via the web-based software PASvisu. ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 120	CE, cULus Listed, EAC (Eurasian), TÜV, KOSHA	772 160	751 004 (1 set)	750 004 (1 set)
▶ 8 safe inputs ▶ 4 safe semiconductor 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	CE, cULus Listed, EAC (Eurasian), TÜV, KOSHA	772 142	751 004 (1 set)	750 004 (1 set)
▶ 4 safe inputs ▶ 4 safe relay outputs, depending on the application up to PL e and SIL CL 3 ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 120	CE, cULus Listed, EAC (Eurasian), TÜV, KOSHA	772 143	751 004 (1 set)	750 004 (1 set)

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Demo software can be downloaded from the Internet (for registered users), information at www.pilz.com/pnozmulti-tools, webcode: web150399

Keep up-to-date on PNOZmulti 2 I/O modules:

 Webcode: web150385

Online information at www.pilz.com

► Configurable safe small controllers PNOZmulti 2

Configurable safe small controllers PNOZmulti 2 – expansion modules, connectible on the right



PNOZ m EF 8DI2DOT



PNOZ m EF 1MM



PNOZ m EF 2MM



PNOZ m ES 14DO

Type	Application area
PNOZ m EF 8DI2DOT	Dual-pole semiconductor output module
PNOZ m EF 1MM	Safe motion monitoring module for monitoring one axis
PNOZ m EF 2MM	Safe motion monitoring module for monitoring two axes
PNOZ m ES 14DO	Output module for standard applications

Common features

- For each expansion module PNOZ m EF 4AI, PNOZ m EF 8DI2DOT, PNOZ m EF 1MM/2MM a separate module program (mIQ) with 256 connection lines can be configured. The user program consists of a main program and one or more module programs. The module program is set up like the main program. Configuration is performed directly in the module program. Processing is decentralised and occurs in the module.

technical details

Features	Certification	Order number		
		Without terminals	Plug-in spring-loaded terminals	Plug-in screw terminals
▶ 2 dual-pole safety outputs using semiconductor technology: Depending on the application, up to PL e in accordance with EN ISO 13849-1 and up to SIL CL 3 in accordance with EN/IEC 62061. The outputs are suitable for controlling a press safety valve in accordance with EN ISO 16092-2. Open circuit detection can be configured ▶ 8 digital inputs: the inputs can be used to evaluate a run monitor for press applications. Configurable pulse suppression at the inputs. ▶ 2 test pulse outputs for detection of shorts across contacts ▶ Press elements in the PNOZmulti Configurator: operating modes such as setup, single-stroke and automatic; monitoring a mechanical rotary cam arrangement; run monitoring to monitor the mechanical transmission for shear pin breakage; monitoring of electrosensitive protective equipment in detection and/or cycle mode; control and monitoring of the press safety valve plus cycle initiation via a two-hand control device ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 120	CE, cULus Listed, EAC (Eurasian), TÜV, KOSHA	772 144	751 004 (1 set)	750 004 (1 set)
▶ Safe monitoring functions in accordance with EN 61800-5-2 (electrical power drive systems with adjustable speed) - Stop 1 (SS1) and stop 2 (SS2) - Safe speed monitoring (SSM) - Safe speed range monitoring (SSR-M) - Safe direction monitoring (SDI-M) - Safe operating stop monitoring (SOS-M) - Safely limited acceleration (SLA-M) - Safe acceleration range (SAR-M) - Analogue voltage (track S) ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 111	CE, cULus Listed, EAC (Eurasian), TÜV, KOSHA	772 170	783 542 (1 set)	793 542 (1 set)
	CE, cULus Listed, EAC (Eurasian), TÜV, KOSHA	772 171	783 544 (1 set)	793 544 (1 set)
▶ Expansion module with 14 semiconductor outputs for non-safety-related applications ▶ Max. 1 output module can be connected on the right side of the base unit PNOZ m B1 ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 120	CE	772 181	751 004 (1 set)	750 004 (1 set)

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Keep up-to-date on PNOZmulti 2 I/O modules:

 Webcode: web150385

Online information at www.pilz.com

► Configurable safe small controllers PNOZmulti 2

Configurable safe small controllers PNOZmulti 2 – expansion modules, connectible on the left



PNOZ m EF PDP Link



PNOZ m EF Multi Link



PNOZ m EF SafetyNET

Type	Application area
PNOZ m EF PDP Link	Safe link module for connecting a base unit to up to 4 decentralised modules PDP67
PNOZ m EF Multi Link	Safe link module for connecting two base units. As many base units as needed can be connected via link modules
PNOZ m EF SafetyNET	Expansion module for safe data exchange between SafetyNET p subscribers via SafetyNET p RTFL
PDP67 F 8DI ION PDP67 F 8DI ION HP	Decentralised input modules

Common features

- Can be configured with the software tool PNOZmulti Configurator
- Status indicators via LEDs

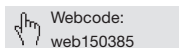
technical details

Features	Certification	Order number		
		Without terminals	Plug-in spring-loaded terminals	Plug-in screw terminals
▶ Maximum number of devices which can be connected: - 4 PDP link modules on the left side of the base unit - 4 decentralised modules PDP67 F 8DI ION (VA) or PDP67 F 8DI ION HP (VA) to 1 PDP link module (maximum configuration: 16 PDP67 modules) - 4 sensors to 1 decentralised PDP67 module (maximum configuration: 64 sensors) ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 120	CE, cULus Listed, EAC (Eurasian), TÜV, KOSHA	772 121	783 540 (1 set)	793 540 (1 set)
▶ On the left side, max. 4 multi-link modules can be connected to the base unit ▶ Point-to-point connection via 4-core shielded, twisted-pair cable ▶ Transfer of 32 bit input data and 32 bit output data (virtual I/Os) ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 120	CE, cULus Listed, EAC (Eurasian), TÜV, KOSHA	772 120	783 538 (1 set)	793 538 (1 set)
▶ Safe communication via the real-time Ethernet SafetyNET p RTFL ▶ In the PNOZmulti Configurator up to 128 virtual inputs and 32 virtual outputs can be defined for safe communication via SafetyNET p ▶ Every PNOZmulti 2 SafetyNET p subscriber (base unit PNOZmulti 2) is assigned a module PNOZ m EF SafetyNET ▶ Up to 16 SafetyNET p subscribers can be connected in a linear structure ▶ Maximum of 1 fieldbus module can in addition be connected ▶ Dimensions in mm (H x W x D): 96 x 45 x 110.7	CE, cULus Listed, EAC (Eurasian), TÜV	772 122	751 017 (1 set)	750 017 (1 set)
For information please refer to pages 100–101	-	-	-	-

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Keep up-to-date on PNOZmulti 2 I/O modules:



Online information at www.pilz.com

► Configurable safe small controllers PNOZmulti 2

Configurable safe small controllers PNOZmulti 2 – communication/fieldbus modules, connectable on the left



PROFINET

PNOZ m ES PROFINET



PROFIBUS

PNOZ m ES PROFIBUS



EtherCAT

PNOZ m ES EtherCAT



EtherNet/IP

PNOZ m ES EtherNet/IP



ETHERNET POWERLINK

PNOZ m ES POWERLINK



CANopen

PNOZ m ES CANopen



CC-Link

PNOZ m ES CC-Link



Ethernet

PNOZ m ES ETH



RS232

PNOZ m ES RS232

Type	Application area
PNOZ m ES PROFINET	Fieldbus module PROFINET (I/O device)
PNOZ m ES PROFIBUS	Fieldbus module PROFIBUS-DP (slave, DPV0)
PNOZ m ES EtherCAT	Fieldbus module EtherCAT (slave, CANopen over EtherCAT)
PNOZ m ES EtherNet/IP	Fieldbus module EtherNet/IP (adapter)
PNOZ m ES POWERLINK	Fieldbus module Ethernet POWERLINK V2 (slave)
PNOZ m ES CANopen	Fieldbus module CANopen (slave, CiA 301 V 4.2.0)
PNOZ m ES CC-Link	Fieldbus module CC-Link
PNOZ m ES ETH	Communication module with Ethernet/Modbus TCP interface
PNOZ m ES RS232	Communication module with serial interface

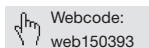
Common features

- Can be configured with the software tool PNOZmulti Configurator
- Status indicators via LEDs

technical details

Features	Certification	Order number		
		Without terminals	Plug-in spring-loaded terminals	Plug-in screw terminals
▶ Transmission rate 100 MBit/s (100BaseTX), full-duplex and half-duplex ▶ Two RJ45 ports ▶ PROFINET I/O Device (V2.2) functions in accordance with conformance class C ▶ Supported functions: RT, IRT, MRP, LLDP ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 110.4	CE, cULus Listed, EAC (Eurasian)	772 138	783 542 (1 set)	793 542 (1 set)
▶ Station addresses from 0 ... 99, selected via rotary switch ▶ Transmission rate: max. 12 MBit/s ▶ Connection to fieldbus via female 9-pin D-Sub connector ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 115	CE, cULus Listed, EAC (Eurasian)	772 132	783 542 (1 set)	793 542 (1 set)
▶ Transmission rate: 100 MBit/s ▶ Max. 148 bytes TxPDO and 20 bytes RxPDO ▶ Connection to fieldbus via RJ45 connector ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 115	CE, cULus Listed, EAC (Eurasian)	772 136	783 542 (1 set)	793 542 (1 set)
▶ Transmission rate: 10 MBit/s, 100 MBit/s ▶ IP address is set at DIP switch on the front of the unit ▶ 2-port switch ▶ Connection to fieldbus via RJ45 connector ▶ Integrated web server ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 110.4	CE, cULus Listed, EAC (Eurasian)	772 137	783 542 (1 set)	793 542 (1 set)
▶ Station addresses from 1 ... 239, selected via rotary switch ▶ Transmission rate: 100 MBit/s ▶ Connection to fieldbus via RJ45 connector ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 110.4	CE, cULus Listed, EAC (Eurasian)	772 119	783 542 (1 set)	793 542 (1 set)
▶ Station addresses from 0 ... 99, selected via rotary switch ▶ Transmission rate: max. 1 MBit/s ▶ Transmission rate selected via rotary switch ▶ Connection to fieldbus via male 9-pin D-Sub connector ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 115	CE, cULus Listed, EAC (Eurasian)	772 134	783 542 (1 set)	793 542 (1 set)
▶ Station addresses from 1 ... 63, selected via rotary switch ▶ Station type: remote device ▶ Occupied stations: 3 ▶ Transmission rate: max. 10 MBit/s ▶ Connection to fieldbus: via 5-pin Combicon plug-in connector ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 110.4	CE, EAC (Eurasian)	772 135	783 542 (1 set)	793 542 (1 set)
▶ With 2 Ethernet interfaces ▶ Transmission rate 10 MBit/s or 100 MBit/s ▶ Connection to fieldbus via RJ45 connector ▶ Can only be used with base unit PNOZ m B0 ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 111	CE, cULus Listed, EAC (Eurasian)	772 130	-	-
▶ 1 serial interface RS232 ▶ Can only be used with base unit PNOZ m B0 ▶ Dimensions (H x W x D) in mm: 101.4 x 22.5 x 120	CE, cULus Listed, EAC (Eurasian)	772 131	783 538 (1 set)	793 538 (1 set)

Keep up-to-date on PNOZmulti 2 communication modules:



Online information at www.pilz.com

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