

Functional safety

From emergency stop relays to safe controllers

Functional safety

In order to implement safety standards in the best possible way, consistent and efficient solutions are required. These requirements are met by our safety portfolio. From simple coupling relays to safe controllers, you'll always find the right logic module for your specific solution.

With our technological expertise and decades of experience, Phoenix Contact drives fundamental research and develops products from the initial idea to series production. Furthermore, our safety experts provide advice and support in every phase of the safety lifecycle.

 Web code: #0299



Our strengths for your success

Phoenix Contact is your expert partner for safety technology. We offer everything from a single source:

- Innovative products
- Technology and solutions
- Services and support
- Expertise and experience

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Find out more with the web code

For detailed information, use the web codes provided in this brochure. Simply enter # and the four-digit number in the search field on our website.

i Web code: #1234 (example)

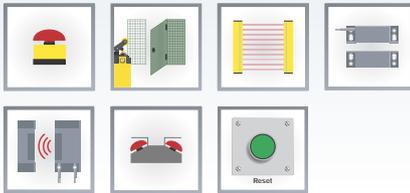
Or use the direct link:
[phoenixcontact.net/webcode/#1234](https://www.phoenixcontact.net/webcode/#1234)

Highly compact safety relays – modular solutions for machine building

As a machine builder, you are familiar with the dynamics and requirements of your market. Safety technology in particular plays an ever increasing role in this field. Standards and directives make an important contribution.

With the PSRmini, we are giving you the option to create new safety concepts that offer you many advantages.

 Web code: #0495



Compatible with numerous signal generators

Compatibility with a wide range of signal generators such as emergency stop equipment, safety door switches, and light grids.



Your advantages

- ✓ Compact design of control cabinet modules, as up to 70% less space is required
- ✓ Cost-benefit optimization through the provision of just one enable contact
- ✓ The complete product range enables a wide range of applications and reduces the number of suppliers



Safety technology in machine building



Scalable safety relay solution



Proven safety for global markets

Force-guided contacts enable maximum safety levels up to PL e in accordance with ISO 13849 and SILCL 3 in accordance with IEC 62061.

Space savings of up to 70%

The highly compact design and high scalability starting from one enable contact make new safety concepts possible.

Highly compact coupling relays – signal availability for the process industry

As a specialist in the process industry, you rank compatibility and reliability among the primary requirements for your systems and components. We would therefore like to introduce you to our highly compact, safe coupling relays for electrical isolation and power adaptation.

Adapted to the relevant process control systems and special requirements of your industry, we offer SIL-certified coupling modules for emergency shutdown and fire and gas applications.

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Space savings of up to 70%

The highly compact design and high scalability starting from one enable contact make new safety concepts possible.

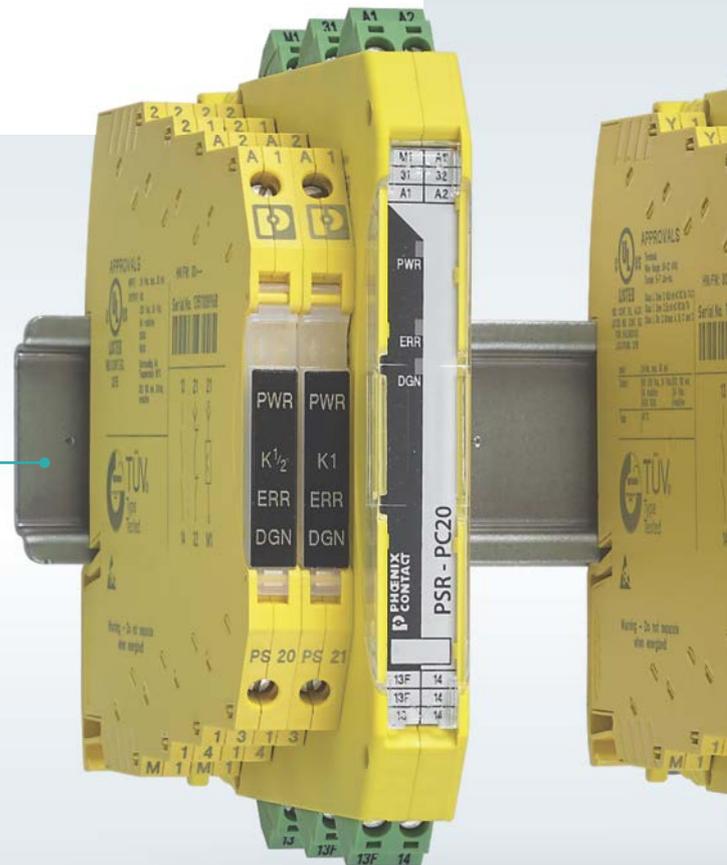
For the first time, safe coupling relays can be used all the way up to potentially explosive areas, thereby simplifying the design of distributed concepts.

Your advantages

- ✓ Innovative diagnostics technologies reduce the time necessary for the proof testing required by standards to a minimum.
- ✓ Visual Diagnostic is the SIL3-qualified verification of defined LED states directly on the module
- ✓ The error signal generator initiates the active feedback of a potential error to the affected DO of the controller

Safe shutdown (emergency shutdown)

Thanks to their redundancy and force-guided contacts, the coupling relays for safe shutdown ensure that every command from your SIS is implemented. After an error is diagnosed, they can be switched back on again by the SIS.



Safe shutdown with interlocking

The internal interlocking (latching) prevents the system from being switched on again in the event of an error. The PSRmini cannot be switched on again after an error is diagnosed.

PSRmini Termination Carrier

The Termination Carrier from Phoenix Contact enables fast, error-free mounting and connection to common safe systems. Signal connection is by means of Plug and Play using standardized system cables. Standardized or controller-specific front adapters are used for connection to your safe system.



Safe switch-on (fire and gas)

The coupling relays ensure that the system can be switched on safely at all times. Versions are available with OFF and ON state diagnostics for comprehensive monitoring of the load side.

Diagnostics technologies

Application	ESD	ESD with latching		F&G
Product	PS20/21/22 PC20/32	PS40	PC40	PC50/51
Visual Diagnostic	●	●	●	●
Error Signal Generator	●	–	●	●
Interlocking	–	●	●	–

ESD (emergency shutdown)
F&G (fire and gas): safe switch-on

Conventional safety relays for machine building

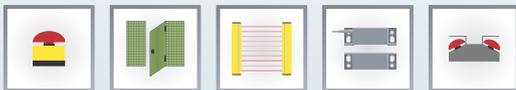
The comprehensive PSRclassic product range includes conventional safety relays with force-guided contacts. Functions such as emergency stop, safety doors, light grids, and two-hand control devices are available in various versions with up to eight enable contacts.

PSRclassic safety relays offer a wide selection of functions and versions. They are particularly suitable for applications in machine building.

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Fast diagnostics

Status LEDs for the supply voltage, input circuit, and relays ensure precise status display.

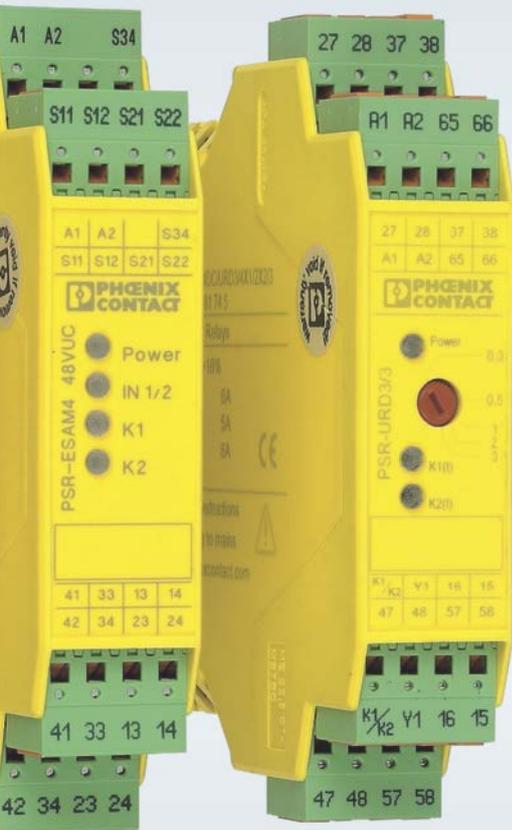
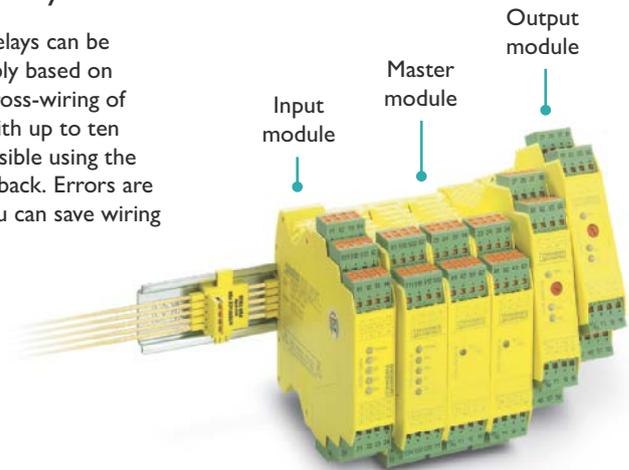


An ideal solution for every function

Safety relays are ideal for use in applications where your machine or system only requires a few safety functions and logic operations – one device per function.

Cross-wiring made easy

The PSRmodular safety relays can be extended easily and flexibly based on the modular principle. Cross-wiring of the master safety relay with up to ten extension modules is possible using the system connector at the back. Errors are therefore avoided and you can save wiring and configuration effort.



Safe time functions

Safety relays with time functions can be set between 0.1 s and 300 s according to the application.

Proven safety technology

The internal redundant design as well as the consistent use of force-guided contacts have long been proven.

Convenient connection technology

The COMBICON connectors are coded and available either as a screw version or a double spring-cage version.

Conventional coupling relays for the process industry

Designed specifically for the process industry, the PSRclassic range offers coupling relays with force-guided contacts for safe switch-on and shutdown.

SIL-certified coupling relays are available for safe signal processing for a large number of functions that are required for emergency shutdown or fire and gas applications, for example.

i Web code: #1548



Approvals and characteristics

All certificates and characteristics are available for easy loop calculation, configuration, and document creation. SIL certification can be identified by the yellow housing color.



Compatible with a range of different safe systems

The integrated test pulse filter and the adapted current control circuit ensure a long service life and optimum compatibility with common safe systems from well-known manufacturers in the process industry.

PSRclassic in the Termination Carrier

As with PSRmini, the prewired Termination Carriers from Phoenix Contact enable fast, error-free mounting and connection to common safe systems.

Signal connection is by means of Plug and Play using standardized system cables. Standardized or controller-specific front adapters are used for connection to your safe system.



Coupling relays with forced guidance

The use of coupling modules with force-guided contacts is recommended wherever safe diagnostics is required.

Easy diagnostics

Features and functions such as force-guided safety relays and line and load detection ensure optimum diagnostics and availability.

Safe signal conditioners

Easily integrate analog signals into your safety application in accordance with the Machinery Directive. The MACX Safety analog signal conditioners are certified according to EN ISO 13849-1 with performance level PL d.

MACX Safety Ex also supports the safe processing of analog, intrinsically safe Ex signals.

i Web code: #1137

DIN rail connector

The DIN rail connector enables the modular bridging of the 24 V supply voltage.



Your advantages

- ✓ Easy integration of analog signals into the safety chain, thanks to performance level PL d
- ✓ Direct, safe switching of limit values possible without an additional safety controller
- ✓ Easy planning of the safety application via SISTEMA
- ✓ Easy to combine active or passive analog signals with other safety modules

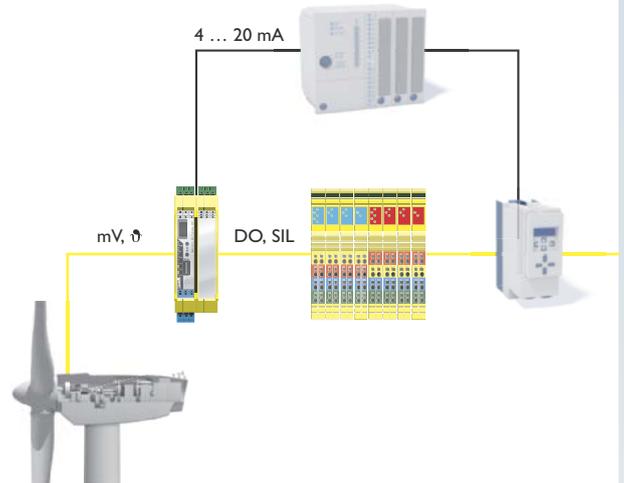
Push-in Technology 

Designed by PHOENIX CONTACT

Safety-related temperature monitoring

The MACX T-UIREL universal temperature transducer has two switching outputs in addition to a current output.

The safety-related switching output, to which two relays are connected, switches limit values directly and safely without an additional safety controller.



Wide range input

Versions with wide range input for worldwide power supply networks (MACX MCR-...-UP).



Ex approvals according to ATEX, IECEx

- Ex i for intrinsically safe circuits up to Zone 0 and Zone 2
- Ex n for installation in Zone 2

Easy-to-maintain connection terminal blocks

Plug-in, coded connection terminal blocks with integrated test sockets.



Multifunctional safety relays

PSRmultifunction offers one higher-level sensor circuit and two local sensor circuits in a single device.

You can therefore implement common applications with up to three safety functions such as emergency stop, safety door or light grid monitoring using just one device. There are four device versions for monitoring different types of sensor, each with screw, spring-cage or tool-free Push-in connection.

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Three functions in one device

The three safety functions are combined in the same narrow housing measuring just 22.5 mm. This reduces your costs for warehousing and logistics and saves space in the application.

Your advantages

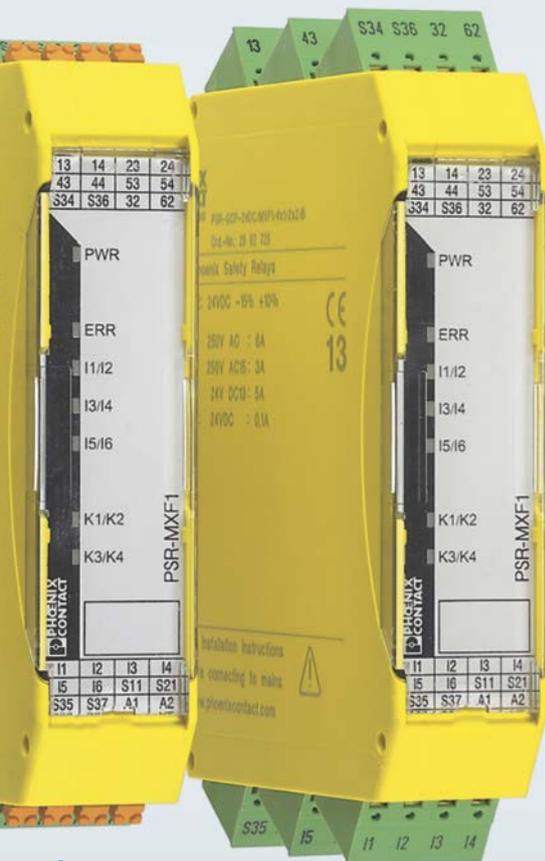
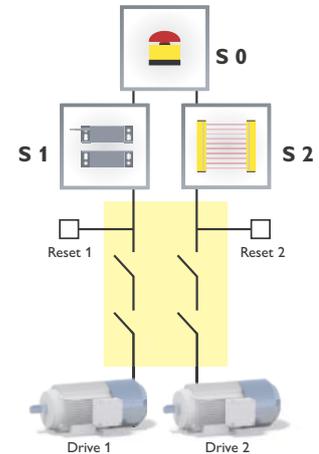
- ✓ Preconnected safety functions in the device mean fewer potential wiring errors
- ✓ The space required is cut by two thirds
- ✓ Reduced costs for warehousing and logistics



Method of operation of multifunctional safety relays

The PSR multifunction safety relays have three sensor circuits which are all connected via one or two channels:

- One higher-level sensor circuit S0
 - Two local sensor circuits S1 and S2
- The local sensor circuits S1 and S2 each cover one function. In the event of an error, both sensor circuits can be reactivated independently of one another. The higher-level sensor circuit S0 monitors both local sensor circuits. If it is triggered, the safety circuits protected by S1 and S2 are both shut down.



Avoid errors

Preconnected safety functions in the device mean fewer potential wiring errors.

Highly compatible

Compatibility with all important signal generators and safety-related systems enables a wide range of applications.

Various connection technologies

Choose between screw, spring-cage, and tool-free Push-in connection.

Zero-speed and over-speed safety relays

The PSRmotion safety relay modules reliably monitor the speed and zero speed of rotating parts in systems and machines.

The narrow PSR-MM25 zero-speed safety relay does not require any additional sensors for monitoring. The residual voltage induced by the motor windings is analyzed in order to detect zero speed.

With the PSR-RSM4 combined zero-speed and over-speed safety relay, sensors such as encoders and proximity switches can be used for motion detection.

i Web code: #1546

Zero-speed and over-speed safety relay – flexible configuration

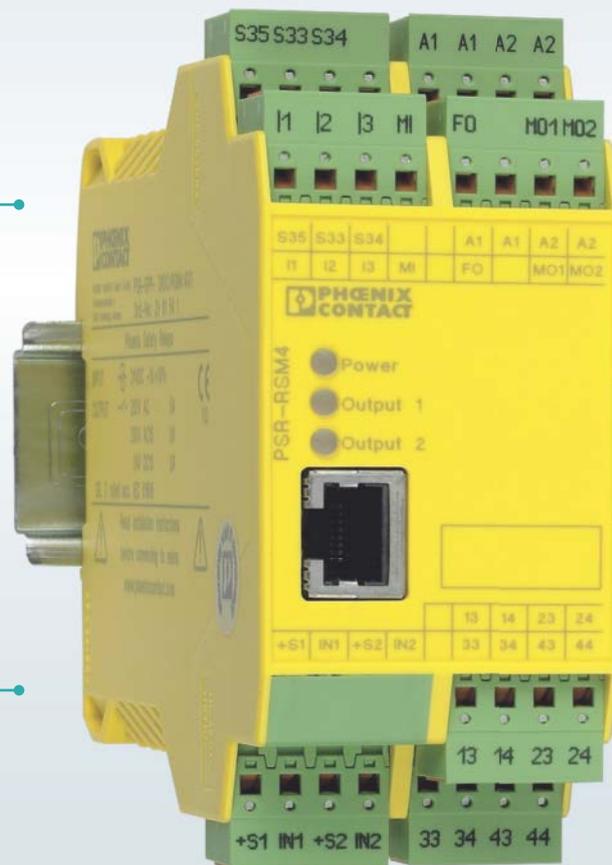
The application-related parameters are set via the software.

Use standard sensors

Encoders or proximity switches are selected via the PSR-CONF-WIN software.

One device with two functions

Safe monitoring of up to three different speeds and one freely definable zero-speed threshold.



Software-parameterizable speed monitoring

The PSR-CONF-WIN software allows you to easily set and transfer all the parameters of the PSR-RSM4.

The software can be downloaded free of charge on our website and easily installed on your Windows system.



Zero-speed safety relay – easy startup

Startup is carried out easily and conveniently via a configuration button.

Sensor-free monitoring

Sensor-free monitoring of single and three-phase AC and DC motors, can be used for machines with or without frequency inverters.

Space savings of up to 75%

Highly compact design (12.5 mm) without limiting performance, thanks to relay technology developed in-house.

Configurable safety modules

Use Trisafe configurable safety modules to customize and combine all safety functions according to your requirements.

Flexibly adapt the Trisafe system to your application requirements using various safe extension modules and fieldbus couplers. The safety logic is created very easily with the SAFECONF configuration software using drag and drop.

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CANopen

DeviceNet

EtherNet/IP

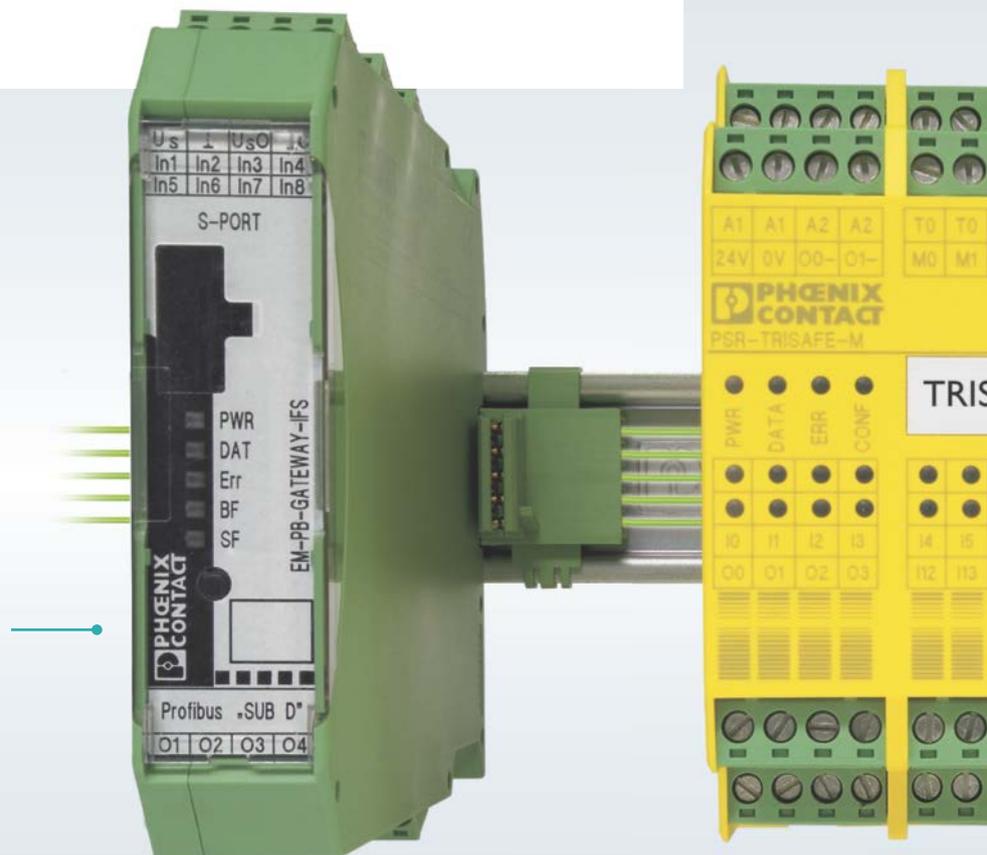
Modbus

PROFIBUS

PROFINET

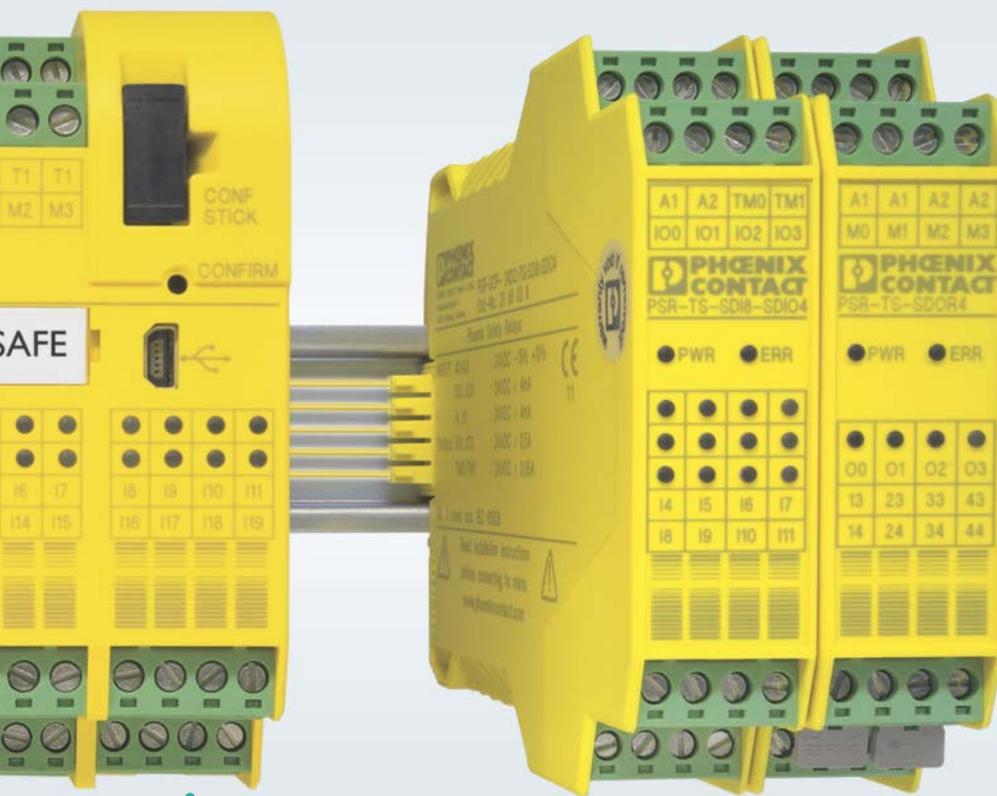
Fieldbus coupler

You can use a fieldbus coupler to easily extend your Trisafe station so that status information for the safety circuits is also available for the machine control system.



Easy configuration using the SAFECONF software

With SAFECONF, you can easily create the safety logic for Trisafe and SafetyBridge Technology using drag and drop. For details of the SAFECONF software, please refer to pages 28 and 29.



Extension modules

Thanks to the modular system, you can easily extend your Trisafe by adding safe digital inputs and outputs, as well as safe relay outputs.

Digital I/O module

- 8 safe inputs, 4 safe outputs
- Clock and signal outputs

Relay output module

- 4 floating relay contacts
- Can be individually configured for 1 or 2-channel shutdown



Trisafe configurable safety module

Safe and freely configurable master module:

- Also available as version for safe extension
- 20 safe inputs, 4 safe outputs
- Clock, signal, and ground switching outputs
- Clear indication of all I/O states by LEDs

Safety relays integrated in the Inline I/O system

Thanks to the extension of the network-open Inline I/O system, a new I/O terminal is now available for additional safety. The Inline ECO Safe terminal is particularly easy to handle and is cost-effective.

It performs the function of two safety relays. In the event of an error, it safely shuts down connected standard output modules. Status and error messages are forwarded to the standard controller on an ongoing basis. This reduces safety-related downtimes.

i Web code: #1545

Inline ECO Safe terminal

Integrate the safe I/O terminals by simply plugging it into your Inline I/O station and monitor up to two sensors circuits per terminal.



Your advantages

- ✓ Shutdown of the actuator supply to downstream output modules
- ✓ Monitor two separate sensor circuits per Inline ECO Safe terminal
- ✓ Startup without parameterization or software
- ✓ Safety functions can be extended by cascading several Inline ECO Safe terminals

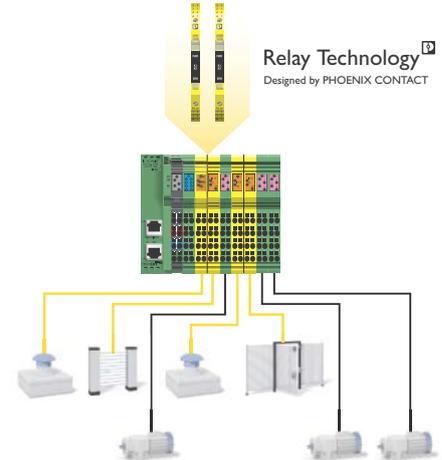
Segmentation

The black power terminal delimits the safety segment. The downstream I/O terminals are not influenced by the Inline ECO Safe terminal.



Cascading several Inline ECO Safe terminals

An Inline ECO Safe terminal monitors two sensor circuits. By cascading the terminals, you can adjust the number of monitored sensor circuits to your application. This means that more complex types of safety logic can also be implemented.



Extensions for the Inline I/O system

- New Inline ECO terminals, each with a dedicated function per terminal
- New bus couplers in a narrow, compact design for EtherCAT® and CANopen®

CANopen

Modbus

DeviceNet

PROFI BUS

EtherCAT

PROFI NET

EtherNet/IP

INTERBUS

SERCOS
the automation bus

Individual and safe shutdown

During normal operation, the controller has full access to the standard output terminals. These output terminals shut down safely when required by the Inline ECO Safe terminal. The number of actuator terminal blocks can be extended individually with additional standard terminals depending on the application.

Safe I/Os for Inline and Axioline F

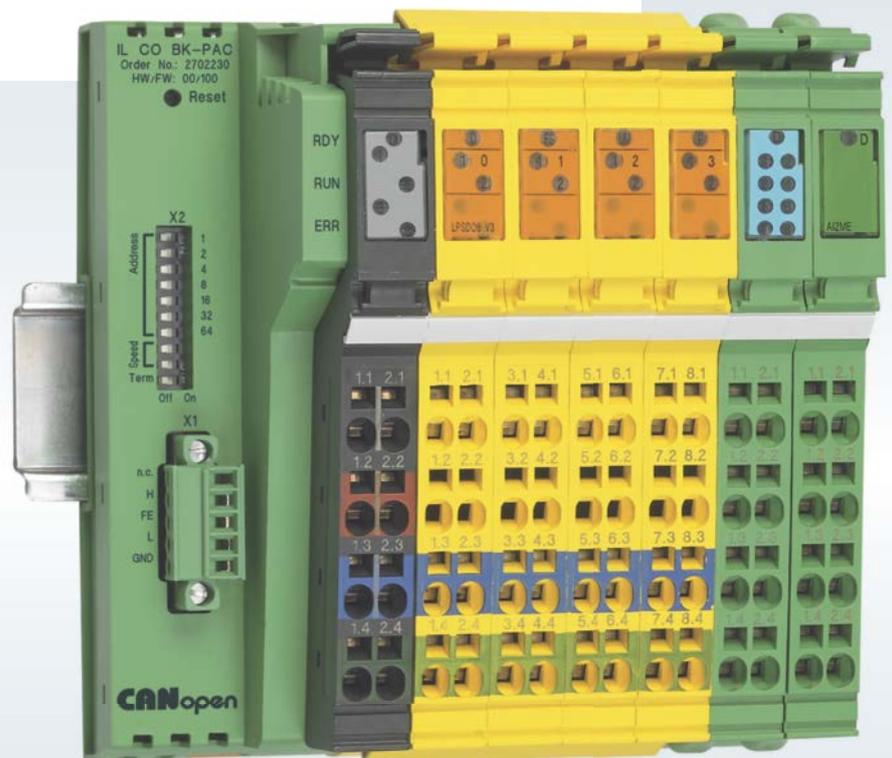
Reliably integrate functional safety into your network with the Inline and Axioline F I/O systems. To do this you do not need a safety controller; you can still use your preferred standard network and your standard controller.

The SafetyBridge network solution is suitable for both new systems and retrofitted applications. Benefit from the flexibility and cost-saving advantages of SafetyBridge Technology.

i Web code: #1544

SafetyBridge logic modules for Inline and Axioline F

The logic module represents the core feature of a SafetyBridge application. It controls the safe application and monitors safety-related communication between the safe I/O modules. The intelligent logic modules can be connected to up to 16 devices.



Your advantages

- ✓ Easy integration in all common fieldbus and Ethernet-based networks
- ✓ You can continue to benefit from the advantages of your preferred network solution
- ✓ Save time and money when designing your machines and systems, as no additional safety networks are required

SafetyBridge Technology 

Designed by PHOENIX CONTACT

Easy configuration using the SAFECONF software

With SAFECONF, you can easily create the safety logic for Trisafe and SafetyBridge Technology using drag and drop. For details of the SAFECONF software, please refer to pages 28 and 29.



SafetyBridge extension modules for Axioline F and Inline

Distributed in the network, the extension modules acquire safety-related signals and output them wherever they are needed. They acquire safe digital inputs or outputs and feature relay contacts.

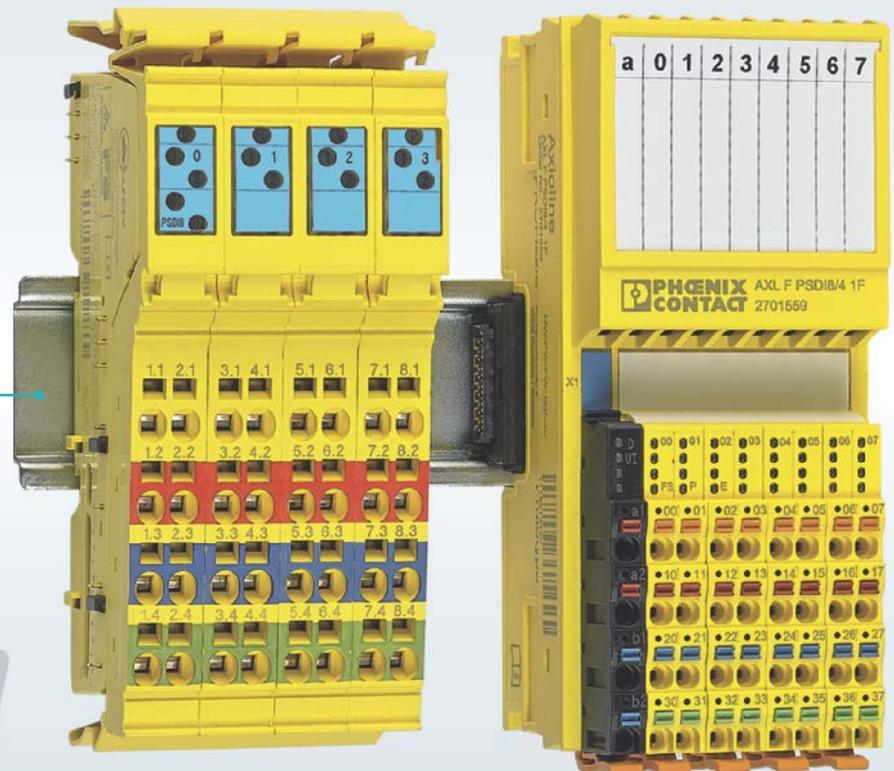
Safe I/O systems with PROFIsafe

Reliably integrate functional safety into your PROFINET networks with the Inline and Axioline F I/O systems. The PROFIsafe gateway enables safe communication between two PROFINET systems.

i Web code: #1544

PROFIsafe I/O modules for Inline

The Inline I/O system is the flexible all-rounder designed down to the last detail. The wide choice of I/O modules and function terminals offers input, output, and relay modules for your PROFIsafe application.



Emphasis on modularity

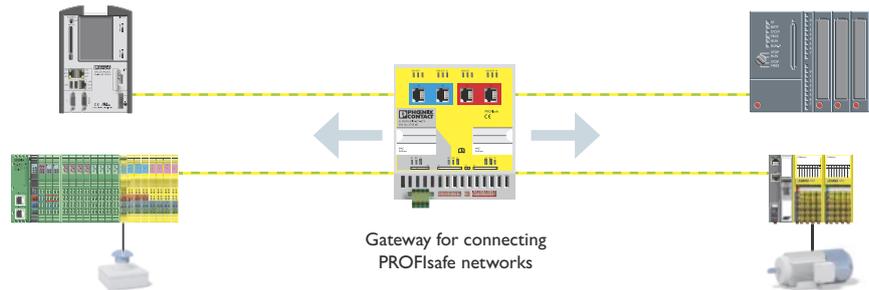
The functions can be combined flexibly as required.

PROFIsafe I/O modules for Axioline F

Axioline F is the robust I/O system that is characterized by its modular design. A safe input module and a safe output module are available for your PROFIsafe application.

Coupling of PROFINET/PROFIsafe systems

The safe PROFINET gateway represents two PROFIsafe devices. Standard I/O process data is exchanged between two PROFIsafe systems using PROFINET and safe I/O process data is exchanged via PROFIsafe. This makes it possible to implement non-proprietary emergency stop concepts across systems.



PROFINET gateway

The safe PROFINET gateway for cross-network PROFINET/PROFIsafe applications.



Safety controller with PROFIsafe

The RFC 470S is a high-end controller for extremely sophisticated automation tasks in safety applications. Not only does this compact controller provide a standard controller for processor-intensive applications in PROFINET networks, the integrated safety controller also enables fast processing of safety-related signals from PROFI-safe devices.

i Web code: #1543

The safety controller as a 2-in-1 combination

The RFC 470S is a PLC with integrated safety controller. It enables you to integrate safety functions in your system or machine. You can therefore reduce installation time and wiring effort.



Safe controller in use



SAFETYPROG programming system

SAFETYPROG is the programming software for our safety controllers. You can use it to implement standard-compliant safety systems for PROFI-safe networks in functional safety applications. A demo version of SAFETYPROG for Windows is available to download on our website.



Diagnostics via the display

High-resolution display with plain text messages for quick and easy local diagnostics.

Safe analog value processing

For safe analog value processing, we offer the SAFE AI software-based solution package. It can be used to process safety-related analog values with standard I/O modules.

The safety controller with power reserves

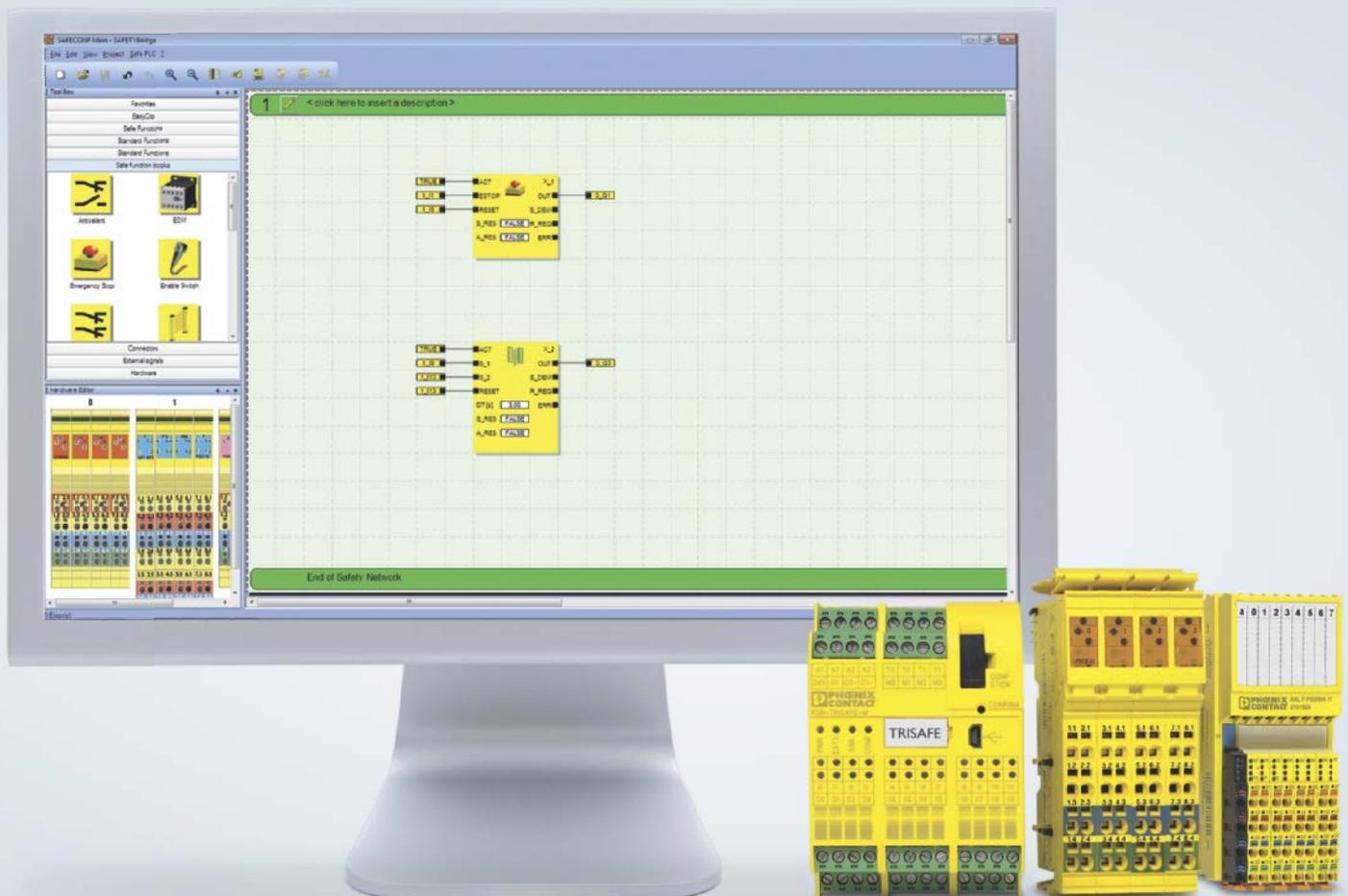
Controls high numbers of I/Os reliably, thanks to powerful processor technology.

Easy configuration

The SAFECONF configuration software can be downloaded free of charge and provides you with all the tools you need to configure your safety logic in accordance with the relevant standards – easily and in a single user interface.

With SAFECONF, you can easily create the safety logic for Trisafe and SafetyBridge Technology using drag and drop.

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Easy configuration using the SAFECONF software

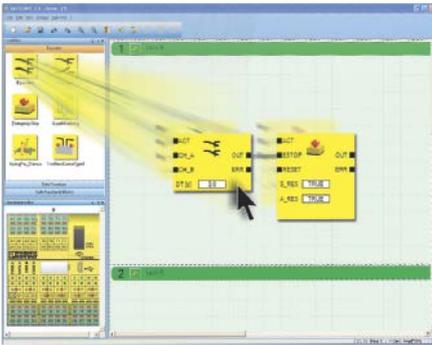
Create the safety logic for Trisafe and SafetyBridge Technology

Easy configuration of the safety logic without any programming knowledge. The safety logic is created using the TÜV-certified blocks by means of drag and drop.

All tools are arranged directly in one window, enabling you to work intuitively with the SAFECONF software.

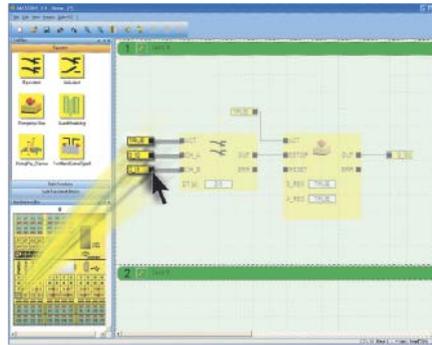
Step 1

Select the safety functions and drag and drop to configure them.



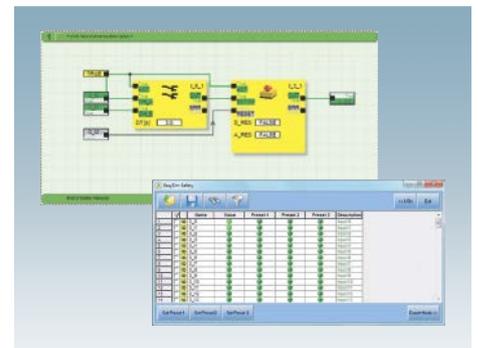
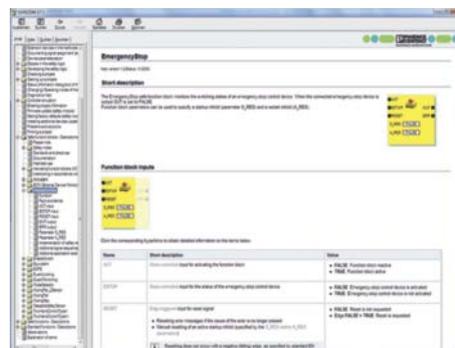
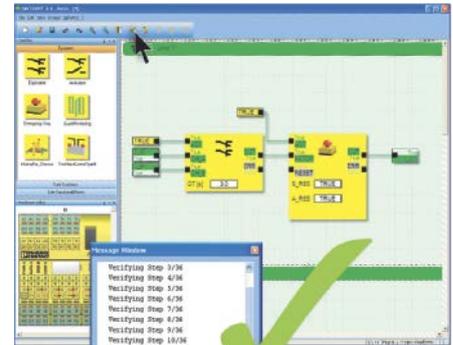
Step 2

Connect the module I/Os to the safety functions.



Step 3

Check and save the safety functions – and you're done!



Integrated E-Learning

The E-Learning features integrated in the software offer support in various areas, such as determining performance level and providing an easy introduction to the software.

Application help

Extremely comprehensive help is available in the form of block-specific and TÜV-certified application examples. This makes the implementation of safety requirements even easier.

Simulation and diagnostics

Shorter project processing times and standardized implementation of safety circuits thanks to the integrated simulation mode. Easy checking and validation of the safety logic directly from your PC.

Safety technology designed by PHOENIX CONTACT

Safety solutions from Phoenix Contact are always developed and certified according to the current requirements for functional safety in machine building and systems manufacturing. Implement your safety functions in accordance with the relevant standards – with the aid of Phoenix Contact.

Here we explain how SafetyBridge Technology works and how you can reliably transmit safe data via wireless technology.



Bluetooth – extremely robust and reliable

Bluetooth's robustness and reliability is primarily due to the adaptive frequency hopping method. It switches up to 1600 times a second between up to 79 transmission channels which are available for data exchange. If a transmission channel is severely affected by interference, the transmission is repeated on another channel that is not experiencing interference. Frequencies that often suffer interference or frequencies used by other wireless systems are automatically excluded. This enables reliable and fast communication.

SafetyBridge Technology 
Designed by PHOENIX CONTACT

Safety technology designed by PHOENIX CONTACT

Safety relays in the I/O system with SafetyBridge

What is SafetyBridge?

SafetyBridge Technology is integrated in the Inline and Axioline F I/O systems and is compatible with all bus couplers of these systems. Regardless of which bus system you operate or which controller you use, by using Phoenix Contact I/O terminals, the safe I/O terminals are available with SafetyBridge Technology.

Correct use of SafetyBridge

The safe I/Os are installed just like standard I/Os, i.e., they are distributed in the machine. You can therefore provide functional safety for your system or machine based on your preferred control

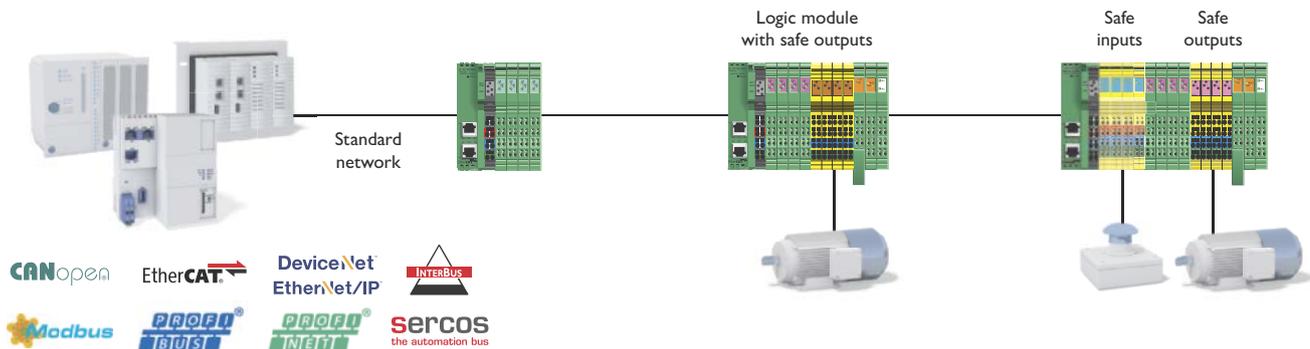
environment, regardless of the bus system used.

Method of operation of SafetyBridge

The SafetyBridge system consists of safe input and output terminals and logic modules. These acquire or output safe signals. The logic module generates and monitors the safety-related SafetyBridge transmission protocol and processes the logic operations of the parameterized safety logic. It therefore assumes the role of a safe controller. The programming is carried out using the free SAFECNF software.

Retrofitting and application extensions

A flexible safety solution can also be easily implemented in retrofit projects and for application extensions.



Transmitting safe data via wireless systems

Standard wireless technologies in industrial use

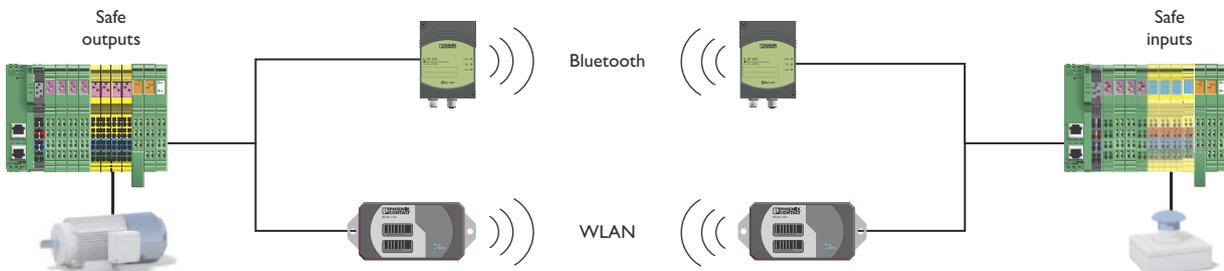
Bluetooth and Wireless LAN industrial wireless technologies differ significantly from standard products for consumer and office applications. The hardware and firmware of Phoenix Contact devices are specifically tailored to the requirements of industrial environments.

Bluetooth supplements WLAN

In many factory buildings, WLAN is already in use as a wireless add-on to the factory network. As a result, the few available WLAN channels are often already occupied. This is where Bluetooth can offer a solution. This technology makes efficient use of the unused frequency ranges between the WLAN channels, allowing them to coexist without interference.

Wireless technology for safety

Both technologies are also ideal for transmitting safety-related data. This means that cables or slip ring transmission can simply be replaced with wireless paths, without altering the safety characteristics of the safety application.

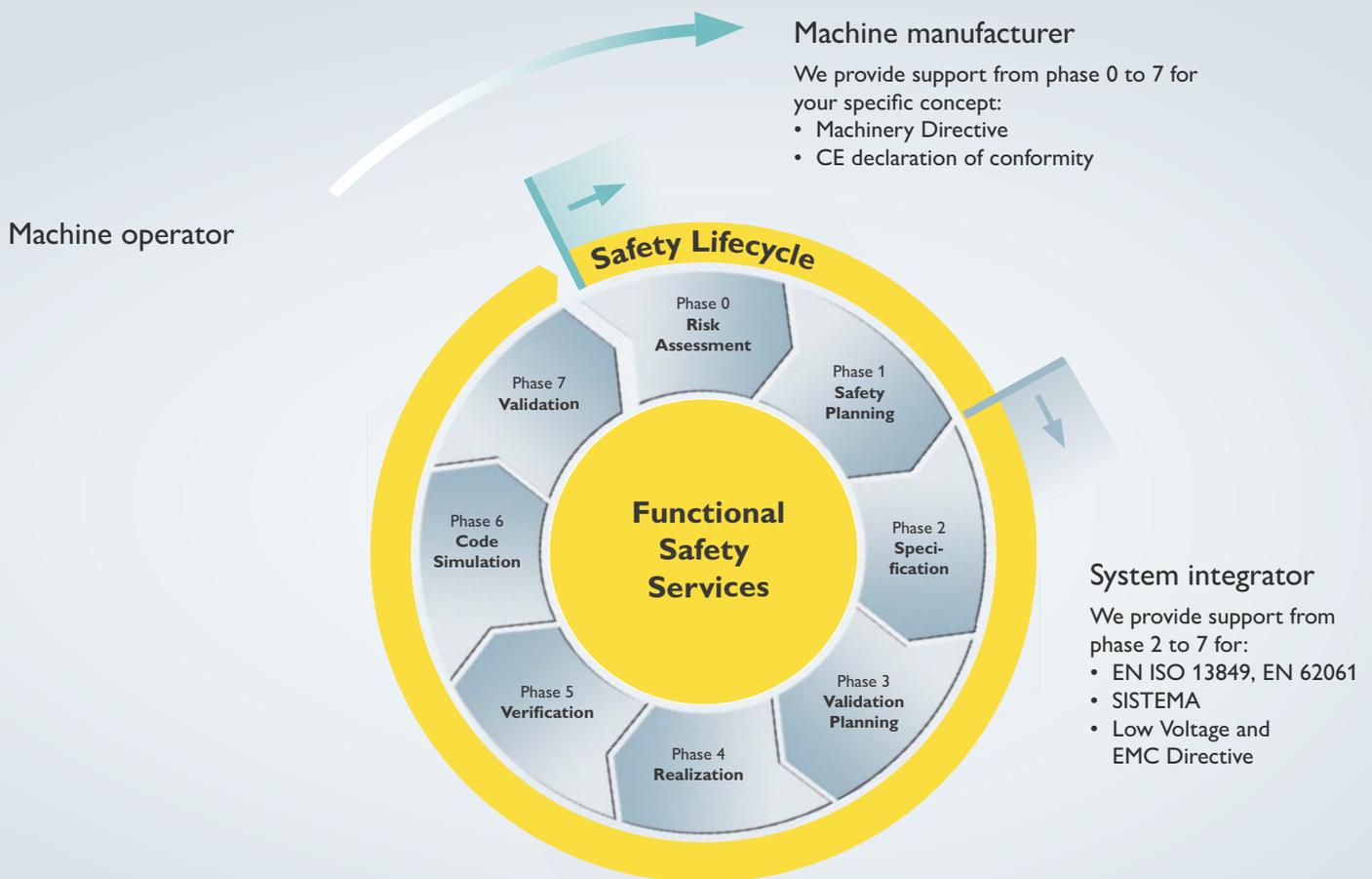


Services for the safety of machinery

Benefit from the comprehensive service offered by our certified safety experts: product and technology expertise from a single source.

Through our services we can help you meet the requirements for the safety of machinery. We will support you in the necessary steps and the verification documentation as well as all the requirements for functional safety.

i Web code: #1075



Product overview

PSRmini: safety relays for machine building																
Type	Applications						Output contacts					Safety approvals		Overall width	Connection technology	
												PL according to EN ISO 13849-1	SILCL according to EN 62061	in mm	Screw connection technology	Spring-cage connection technology
PSR-MS20 ¹⁾ 24 V DC	●	●	–	●	–	–	A	1	–	–	1	c ⁴⁾	1 ⁴⁾	6.8	2904950	–
PSR-MS21 24 V DC	Coupling module for safe controllers						A	1	–	–	1	e	3	6.8	2702192	–
PSR-MS25 ¹⁾ 24 V DC	●	●	–	●	–	–	M	1	–	–	1	c ⁴⁾	1 ⁴⁾	6.8	2904951	–
PSR-MS30 24 V DC	●	●	–	●	–	●	A	1	–	–	–	e	3	6.8	2904952	–
PSR-MS35 24 V DC	●	●	–	●	–	●	M	1	–	–	–	e	3	6.8	2904953	–
PSR-MS40 ³⁾ 24 V DC	●	●	–	–	–	●	A	1	–	–	1	e	3	6.8	2904954	–
PSR-MS45 ³⁾ 24 V DC	●	●	–	–	–	●	M	1	–	–	1	e	3	6.8	2904955	–
PSR-MS50 ²⁾ 24 V DC	●	●	–	●	–	–	A	1	–	–	1	e	3	6.8	2904956	–
PSR-MS55 ²⁾ 24 V DC	●	●	–	●	–	–	M	1	–	–	1	e	3	6.8	2904957	–
PSR-MS60 ³⁾ 24 V DC	●	●	●	●	–	●	A	2	–	–	–	e	3	6.8	2904958	–
PSR-MC20 ¹⁾ 24 V DC	●	●	–	●	–	–	A/M	3	–	–	1	c ⁴⁾	1 ⁴⁾	12.5	2700466	2700467
PSR-MC30 24 V DC	●	●	–	●	–	●	A/M	2	–	–	1	e	3	12.5	2700498	2700499
PSR-MC32 24...230 V DC	●	●	●	●	–	●	A/M	3	–	1	–	e	3	22.5	2700524	2700525
PSR-MC34 24 V DC	●	●	–	●	–	●	A/M	3	–	–	1	e	3	12.5	2700540	2700548
PSR-MC37 ⁵⁾ 24 V DC	●	●	–	●	–	–	A	3	–	1	1	e	3	22.5	2702411	2702412
PSR-MC40 ³⁾ 24 V DC	●	●	●	●	–	●	A/M	3	–	–	1	e	3	12.5	2700569	2700570
PSR-MC50 ²⁾ 24 V DC	●	●	–	●	–	–	A/M	3	–	–	1	e	3	12.5	2700553	2700564
PSR-MC60 ⁸⁾ 24 V DC	–	–	–	–	●	–	A	2	–	–	1	c	1	12.5	2700571	2700572
PSR-MC62 ⁹⁾ 24 V DC	–	–	–	–	●	–	A	2	–	–	1	e	3	12.5	2700574	2700575
PSR-MC70 24 V DC	●	●	●	●	–	●	A/M	1	1	–	1	c ⁴⁾	1 ⁴⁾	12.5	2702094	2702095
PSR-MC72 24 V DC	●	●	●	●	–	●	A/M	1	1	–	1	e	3	12.5	2702096	2702097
PSR-MC82 24 V DC	Contact extension						–	5	–	1	1	e ⁶⁾	3 ⁶⁾	17.5	2702382	2702383

1) 1-channel sensor circuit 2) Non-equivalent sensor circuit 3) Without cross-circuit detection 4) Up to PL e/SILCL 3 possible depending on the application
5) EN 81 approval 6) In conjunction with suitable evaluating device 7) Undelayed contacts: Cat. 4/PL e, SILCL 3; contacts with dropout delay: Cat. 3/PL d, SILCL 2
8) Type IIIA acc. to EN 574 9) Type IIIC acc. to EN 574
A = automatic start, M = manual, monitored start

Product overview

PSRmini: safe coupling relays for the process industry																
Type	Applications	Output contacts			Diagnostics/proof test				Safety approvals				Overall width	Connection technology		
	Highly compact, safe coupling relays for failsafe controllers:				Visual via LED	Active error acknowledgment via A1 ²⁾	Measurement on the device	Self-monitoring with interlocking	SIL according to IEC 61508 / 61511	SIL according to IEC 50156	ATEX / IECEx / Class I Zone 2	G3 according to ANSI / ISA-S71.04	GL	in mm	Screw connection technology	Spring-cage connection technology
PSR-PS20 24 V DC	For safety-related shutdown (ESD)	1	1	1	●	●	●	–	3	3	●	●	●	6.8	2700356	–
PSR-PS21 24 V DC		1	1	1	●	●	●	–	2	2	●	●	●	6.8	2700357	–
PSR-PS22 24 V DC		1	1	–	●	●	●	–	3	3	●	●	●	6.8	2702524	–
PSR-PS40 24 V DC		1	–	1	●	–	–	●	3	3	●	●	●	12.5	2700398	–
PSR-PC20 24 V DC		1	1	1	●	●	●	–	3	3	●	●	●	12.5	2700577	2700578
PSR-PC32 24 ... 230 V		2	1	–	●	–	●	–	3	3	●	●	●	17.5	2700581	2700582
PSR-PC40 24 V DC		2	–	1	●	●	–	●	3	3	●	●	●	12.5	2700588	2700589
PSR-PC50 24 V DC	For safety-related switch-on (F&G)	1	–	1	–	●	●	–	3 ¹⁾	–	●	–	●	17.5	2904664	2904665

1) Low demand 2) With suitable controller

PSRclassic: safe coupling relays for universal applications											
Type	Applications	Output contacts			Safety approvals		Input voltage	Connection technology			
					PL according to EN ISO 13849-1	SILCL according to EN 62061		Screw connection technology	Spring-cage connection technology	Screw connection technology, fixed	Spring-cage connection technology, fixed
PSR-URM	Coupling relays for universal applications	5	2	–	c	1	24 V AC/DC	2963747	2963970	–	–
							120 V AC/DC	2981402	2981415	–	–
PSR-URM/3X1		3	3	–	c	1	24 V AC/DC	2981839	2981842	–	–
							120 V AC/DC	–	–	–	–
PSR-URM/5X1		5	1	–	c	1	24 V AC/DC	2981952	2981965	–	–
							120 V AC/DC	–	–	–	–
PSR-URM/2X21		–	–	2	c	1	24 V AC/DC	–	–	2981363	–
							120 V AC/DC	–	–	2981376	–
PSR-URM/4X1		4	2	–	c	1	24 V AC/DC	–	–	2981444	2981457
							120 V AC/DC	–	–	–	–

PSRclassic: safe coupling relays for the process industry

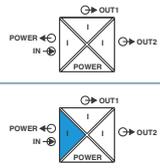
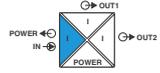
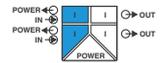
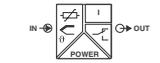
Type	Applications	Output contacts			Diagnostics/proof test				Safety approvals				Overall width	Connection technology		
					Visual via LED	Active error acknowledgment via A1	Measurement on the device	Self-monitoring with interlocking	SIL according to IEC 61508 / 61511	SIL according to IEC 50156	ATEX / IECEx / Class I Zone 2	G3 according to ANSI / ISA-571.04		GL	in mm	Screw connection technology
	Highly compact, safe coupling relays for failsafe controllers:				Visual via LED	Active error acknowledgment via A1	Measurement on the device	Self-monitoring with interlocking	SIL according to IEC 61508 / 61511	SIL according to IEC 50156	ATEX / IECEx / Class I Zone 2	G3 according to ANSI / ISA-571.04	GL	in mm	Screw connection technology	Spring-cage connection technology
PSR-FSP 24 V DC	For safety-related shutdown (ESD)	1	1	-	-	-	●	-	3	3	-	-	●	17.5	2981978	2981981
PSR-FSP/2x1 24 V DC		2	1	-	-	-	●	-	3	3	-	-	●	17.5	2986960	2986957
PSR-FSP2/2x1 24 V DC		2	1	-	-	-	●	-	2	2	-	-	●	17.5	2986575	2986588
PSR-ESP4 24 V DC		2	1	-	-	-	-	●	1 ⁴⁾	-	-	-	●	22.5	2981020	2981017

PSRclassic: safety relays for machine building

Type	Applications							Output contacts				Safety approvals		Connection technology	
												PL according to EN ISO 13849-1	SILCL according to EN 62061	Screw connection technology	Spring-cage connection technology
PSR-ESA2-B 24 V AC/DC	●	●	-	-	-	-	A	4	-	1	-	c ⁴⁾	1 ⁴⁾	2963802	2963954
PSR-ESAM2/3X1-B 230 V AC/DC	●	●	-	-	-	-	A/M	3	-	1	-	c ⁴⁾	1 ⁴⁾	2901430	2901431
PSR-ESAM4/2X1 24 V AC/DC	●	●	-	-	-	-	A/M	2	-	1	-	e	3	2900525	2900526
PSR-ESAM4/3X1-B Voltage variants	●	●	-	-	-	-	A/M	3	-	1	-	e	3	Ordering data, see catalog	
PSR-ESAM4/8X1 24 V AC/DC	●	●	-	-	-	-	A/M	8	-	1	-	e	3	2963912	2963996
PSR-ESD-30 24 V DC	●	●	●	●	-	●	A/M	2	2	-	-	e	3	2981800	2981813
PSR-ESD-300 24 V DC	●	●	●	-	-	●	A/M	3	2	1	-	e ⁷⁾	3 ⁷⁾	2981428	2981431
PSR-ESD-T 24 V AC/DC	●	●	●	-	-	●	A/M	3	2	1	-	e ⁷⁾	3 ⁷⁾	Fixed times – ordering data, see catalog	
PSR-ESL4 ³⁾ 24 V AC/DC	●	●	●	-	-	●	A/M	3	-	1	-	e	3	2981059	2981062
PSR-THC4 ⁹⁾ 24 V AC/DC	-	●	-	-	●	-	A	2	-	1	-	e	3	2963721	2963983
PSR-URML4 ³⁾ 24 V DC	Contact extension for OSSD signals							3	-	1	-	e	3	2903583	2903584
PSR-URM4 42 ... 230 V AC/DC	Contact extension							4	-	2	-	e ⁶⁾	3 ⁶⁾	2702924	2702925
PSR-URM4 24 V AC/DC	Contact extension							5	-	2	-	e ⁶⁾	3 ⁶⁾	2963734	2964005
PSR-URM4-B 24 V AC/DC	Contact extension							5	-	2	-	e ⁶⁾	3 ⁶⁾	2981033	2981046

3) Without cross-circuit detection 4) Up to PL e/SILCL 3 possible depending on the application 6) In conjunction with suitable evaluating device 7) Undelayed contacts: Cat. 4/PL e, SILCL 3; contacts with dropout delay: Cat. 3/PL d, SILCL 2 9) Type IIIC acc. to EN 574, A = automatic start, M = manual, monitored start

Product overview

MACX Analog: safe signal conditioners										
Type	Application	Analog input	Output	Safety approvals			Overall width	Connection technology		
				SILCL EN 62061	Ex approval	HART-compatible	in mm	Screw connection technology	Push-in connection technology	
	Repeater power supply and input signal conditioner with two outputs	Repeater power supply and input isolator operation: 4 ... 20 mA; transmitter supply voltage: > 16 V (20 mA)	Input isolator operation: 4 ... 20 mA per output, active	2	–	●	12.5	2904961	2904962	
				2	●	●	12.5	2904959	2904960	
	Repeater power supply, two-channel	Repeater power supply operation: 4 ... 20 mA per channel; transmitter supply voltage: > 16 V (20 mA) per channel	Repeater power supply operation: 4 ... 20 mA per channel, active	3	●	●	12.5	2904963	2904964	
	Temperature transducer, universally configurable with limit value relay	RTD, TC, potentiometer, linear resistors	Analog: 4...20 mA, active Digital: combination of relay 2 and 3, functionally safe, one additional relay output	2	–	–	35	2904901	2904903	
				2	●	–	35	2904910	2904912	

PSRmodular: safety relays for machine building															
Type	Applications							Output contacts				Safety approvals		Connection technology	
												PL according to EN ISO 13849-1	SILCL according to EN 62061	Screw connection technology	Spring-cage connection technology
PSR-SDC4 24 V DC	●	●	●	●	–	●	A/M	2	–	–	1	e	3	2981486	2981499
PSR-URM4/B 24 V DC	Contact extension							4	–	2	–	e	3	2981677	2981680
PSR-URD3/3 24 V DC	Contact extension							–	4	2 ¹⁾	–	d	2	2981732	2981745
PSR-URD3/30 24 V DC	Contact extension							–	4	2 ¹⁾	–	d	2	2981512	2981525
PSR-URD3/T2 24 V DC	Contact extension							–	4	2 ¹⁾	–	d	2	2981703	2981729
PSR-SIM4	IP20 input extension – interface module for up to 4 safety sensors												2981936	2981949	
PSR-SACB...	IP65/IP67 input extension – sensor box for up to 4 safety sensors, available with 5 and 10 m cable lengths												5 m	2981871	
													10 m	2981884	

1) Delayed, A = automatic start, M = manual, monitored start

PSRmultifunction: safety relays for machine building

Type	Applications							Output contacts		Safety approvals		Connection technology		
											PL according to EN ISO 13849-1	SILCL according to EN 62061	Screw connection technology	Spring-cage connection technology
 PSR-MXF1 24 V DC	●	●	–	–	–	–	A/M	4	2	e	3	2902725	2902726	2903253
PSR-MXF2 24 V DC	●	●	–	●	–	–	A/M	4	2	e	3	2903254	2903255	2903256
PSR-MXF3 24 V DC	●	●	●	–	–	●	A/M	4	2	e	3	2903257	2903258	2903259
PSR-MXF4 24 V DC	●	●	●	●	–	●	A/M	4	2	e	3	2903260	2903261	2903262

PSRmotion: zero-speed and over-speed safety relays

Type	Applications					Output contacts		Safety approvals			Connection technology	
				n=0	n<n _{max}			Cat. according to EN ISO 13849-1	PL according to EN ISO 13849-1	SILCL according to EN 62061	Screw connection technology	Spring-cage connection technology
 PSR-RSM4 24 V DC	–	●	●	●	●	4	3	4	e	3	2981538	2981541
PSR-MM25 24 V DC	●	–	–	●	–	1	2	3	e	3	2702355	2702356

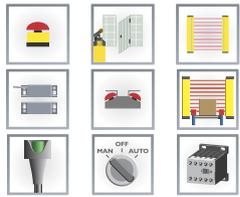
Trisafe: configurable safety modules

Type	Applications	Inputs/outputs					Safety approvals					Connection technology	
		Inputs	Safe control outputs	Ground switching outputs	Clock outputs	Signal outputs	Category according to EN ISO 13849-1	PL according to EN ISO 13849-1	SILCL according to EN 62061	SIL according to IEC 61508	SIL according to IEC 50156	Screw connection technology	Spring-cage connection technology
 PSR-Trisafe-S 24 V DC	                   	20	4	2	2	4	4	e	3	3	3	2986229	2986232
PSR-Trisafe-M 24 V DC	                   	20	4	2	2	4	4	e	3	3	3	2986012	2986025
PSR-TS-SDI8-SDIO4 24 V DC	                   	8	4 ¹⁾	–	2 ¹⁾	2 ¹⁾	4	e	3	3	3	2986038	2986041
PSR-TS-SDOR4 24 V DC	                   	–	4 ³⁾	–	–	4	4 ²⁾	e ²⁾	3 ²⁾	3 ²⁾	3	2986096	2986106

1) Configurable via software: outputs to inputs / signal outputs to clock outputs 2) Up to ... depending on connection

3) Configurable via software: 4 x 1-channel or 2 x 2-channel

Product overview

Safe I/Os for all common bus systems													
Type	Applications	Inputs/outputs				Protocol		Safety approvals				Order No.	
		Safe inputs	Safe outputs	Clock outputs	Relay outputs	SafetyBridge Technology	PROFIsafe	Category according to EN ISO 13849-1	PL according to EN ISO 13849-1	SILCL according to EN 62061	SIL according to IEC 61508		
Logic modules													
IB IL 24 LPSDO 8 V2-PAC 24 V DC	Logic module with SafetyBridge Technology V2	–	8	–	–	●	–	4	e	3	3	2700606	
IB IL 24 LPSDO 8 V3-PAC 24 V DC	Logic module with SafetyBridge Technology V3	–	8	–	–	●	–	4	e	3	3	2701625	
AXL F LPSDO8/3 IF 24 V DC	Logic module with SafetyBridge Technology V3	–	8	–	–	●	–	4	e	3	3	2702171	
Safe I/Os for Inline													
IB IL 24 PSDI 8-PAC 24 V DC	Input module	8	–	8	–	●	●	4	e	3	3	2985688	
IB IL 24 PSDI 16-PAC 24 V DC	Input module ¹⁾	16	–	16	–	●	●	4	e	3	3	2700994	
IB IL 24 PSDO 8-PAC 24 V DC	Output module	–	8	–	–	●	●	4	e	3	3	2985631	
IB IL 24 PSDO 4/4-PAC 24 V DC	Output module (positive and negative switching)	–	4	–	–	●	●	4	e	3	3	2916493	
IB IL 24 PSDOR 4-PAC 24 V DC / 230 V DC	Relay module	–	–	–	4	●	●	4	e	3	3	2985864	
IB IL SAFE 2-ECO 24 V DC	Input module with two sensor circuits	–	–	–	–	–	–	4	e	3	3	2702446	
Safe I/Os for Axioline F													
AXL F SSDI8/4 1F 24 V DC	Input module	8	–	–	–	●	–	4	e	3	3	2702263	
AXL F SSDO8/3 1F 24 V DC	Output module	–	8	–	–	●	–	4	e	3	3	2702264	
AXL F PSDI8/4 1F 24 V DC	Input module	8	–	–	–	–	●	4	e	3	3	2701559	
AXL F PSDO8/3 1F 24 V DC	Output module	–	8	–	–	–	●	4	e	3	3	2701560	
PROFIsafe control technology													
RFC 470S PN 3TX	Safety controller that can be freely programmed using LD and FBD	Up to 170 safe devices				PROFIsafe via PROFINET		4	e	3	3	2916794	
FL PN/PN SDIO-2TX/2TX	Safe PROFINET gateway	–				PROFIsafe via PROFINET		4	e	3	3	2700651	
SD cards													
SD card MUX	Two of these SD cards, with two ILC 131 ETHs and the individually required input and output terminals, form a multiplexer system that requires no programming.											2701872	
SD FLASH easy safe basic	Program and configuration memory, plug-in, 2 GB, with license key and application program for easy web-based configuration and startup of a SafetyBridge solution.											2403297	
SD FLASH easy safe pro	As per SD FLASH easy safe basic, plus communication via Modbus/TCP, PROFINET, and e-mail.											2403298	

1) Only compatible with IB IL 24 LPSDO V3-PAC

SAFECONF configuration software and SAFETYPROG programming software

	Type	Applications	Order No.
	IFS-CONFSTICK	Memory module for Trisafe	2986122
	SAFECONF	Free configuration software for Trisafe and SafetyBridge modules. Download at phoenixcontact.com	–
		Configuration package including software, USB cable, and quick start guide; multi-lingual	2986119
	SAFETYPROG Basic	SAFETYPROG programming software, including certified PLCopen blocks	2700443
	SAFETYPROG Advanced		2700441
	SAFETYPROG Professional		2700442
	SAFE AI function block	Function block library for safety-related analog value acquisition with standard I/O modules	2400057

Product support

Safety hotline

Please speak to your personal sales partner directly or contact our headquarters in Blomberg.

Safety support

- Startup support
- On-site service
- Hardware/software workshops

Concept support

- Concept formulation
- Concept assessment
- Software check (SAFETYPROG/SAFECONF)

Functional safety app

With our safety app, you can gain a basic overview of the safety of machinery and a quick status check on the Machinery Directive requirements you have implemented.

Other features of the app include tools for risk assessment and calculating the probability of components failing.

An interactive quiz can help you to see where you're at and identify gaps in your knowledge.

Search term: Phoenix Contact safety



Key for applications, outputs, and safety approvals

 Emergency stop	 Transponder switch	 Safety door switch	 Mode selector switch	 Enabling current path/N/O contact	 Forced guidance
 Safety door switch, mechanical	 Start/restart	 Two-hand function	 Contactor control	 N/C contact	 Zero-speed safety relay
 Light grid	 Initiators	 Muting	 Encoder	 Changeover contact	 Over-speed safety relay
 Solenoid switch	 Extended temperature range	 Enable switch	 Sensor-free motor monitoring	 Contact with dropout delay	 Switching capacity

In dialog with customers and partners worldwide

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The wide variety of our innovative products makes it easy for our customers to find future-oriented solutions for different applications and industries. We especially focus on the fields of energy, infrastructure, process and factory automation.



You will find our complete product range at:
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