PSR-M-EF6

Safe extension module for connection to the PSR-M-B1, PSR-M-B2 or PSR-M-B3 basic device



Data sheet
109486_en_02

© Phoenix Contact 2025-08-21

1 Description

Intended Use

The safe extension module is used, in combination with the PSR-M-B1, PSR-M-B2 or PSR-M-B3 basic device, to control actuators. The extension module interrupts circuits in a safety-related way.

Configuration is performed via the PSRmodular Software. The outputs are controlled after the incoming signals have been evaluated in accordance with the configuration.

Signal connections

- 4 safe relay outputs
- 4 reset inputs

Achievable safety integrity

- Suitable up to category 4, PL e (EN ISO 13849-1), SIL 3 (EN IEC 62061)

Additional features

- TBUS interface for connection to the PSR-M-B1, PSR-M-B2 or PSR-M-B3 base module.
- Optional pluggable screw or Push-in terminal blocks
- 22.5 mm housing width

Approvals

Observe these notes

WARNING: Risk of electric shock
Observe the safety regulations and installation notes in the corresponding section.

Make sure you always use the latest documentation.
It can be downloaded from the product at phoenixcontact.com/products.

This document is valid for the products listed in the “Ordering data” chapter.
This document meets the same requirements as the original operating instructions with respect to the contents.

2 Table of contents

1 Description 1
2 Table of contents 2
3 Ordering data 3
4 Technical data 4
5 Interface type (ZVEI classification) 8
6 Notes regarding documentation 9
7 Safety regulations and installation notes 10
8 Transport, storage, and unpacking 12
9 Function description 12
10 Block diagram 13
11 Derating 14
12 Operating and indication elements 15
13 Mounting and removing 16
14 Wiring 17
15 Startup 17
16 Calculating the power dissipation 18
17 Function test/proof test 18
18 Diagnostics 19
19 Application example 21
20 Device replacement, device defect, and repair 22
21 Maintenance, decommissioning, and disposal 22
22 Attachment 23

3 Ordering data

Description	Type	Item no.	Pcs./Pkt.
Safe extension module with 4 safe relay outputs, 4 reset inputs, TBUS interface, up to SIL 3, Cat. 4/PL e, pluggable screw terminal block, TBUS connector included	PSR-M-EF6-SDOR4-SC	1104982	1
Safe extension module with 4 safe relay outputs, 4 reset inputs, TBUS interface, up to SIL 3, Cat. 4/PL e, pluggable Push-in terminal block, TBUS connector included	PSR-M-EF6-SDOR4-PI	1104983	1

Documentation	Type	Item No.	Pcs./Pkt.
User manual, English: PSRmodular: Configurable safety system	UM EN PSRmodular System	-	-
User manual, English: PSRmodular: System diagnostics	UM EN PSRmodular System diagnostics	-	-

Accessories	Type	Item no.	Pcs./Pkt.
Coding profile, is inserted into the slot on the plug or inverted header, red insulating material	CP-MSTB	1734634	100
Coding section, inserted into the recess in the header or the inverted plug, red insulating material	CR-MSTB	1734401	100
Crimping pliers, for ferrules without insulating collar according to DIN 46228 Part 1 and ferrules with insulating collar according to DIN 46228 Part 4, 0.25 mm² ... 6.0 mm², lateral entry, trapezoidal crimp	CRIMPFOX 6	1212034	1
Insertion bridge for connectors with 5.0 mm or 5.08 mm pitch	EBP 2- 5	1733169	10

4 Technical data

Hardware/firmware version	
Hardware/firmware version (1104982)	≥ 00/0.2.2
Hardware/firmware version (1104983)	≥ 00/0.2.2

The technical data and safety characteristics are valid as of the specified HW/FW version.

Supply: A1/A2	
Rated control circuit supply voltage U_S	24 V DC -20 % / +20 % (external fuse, typically 4 A)
Rated control circuit supply voltage U_S	19.2 V DC ... 28.8 V DC
Rated control supply current I_S	typ. 120 mA
Power consumption at U_S	typ. 2.88 W
Inrush current	2 A (Δt = 1 ms at U_s)
Filter time	typ. 5 ms (at A1 in the event of voltage dips at U_s)
Cable length	max. 30 m
Protective circuit	Serial protection against polarity reversal

Digital inputs: Reset inputs (FBK1, FBK2, FBK3, FBK4)	
Number of inputs	4
Description of the input	IEC 61131-2 Type 2
Input voltage range "0" signal	0 V DC ... 5 V DC
Input current range "0" signal	< 1 mA
Input voltage range "1" signal	11 V DC ... 28.8 V DC
Current consumption	typ. 10 mA (typ. with U_S) max. 13 mA (at a control voltage of 28.8 V DC)
Filter time	250 ms ±2 ms (Test pulse rate > 500 ms)
Max. permissible overall conductor resistance	1.2 kΩ (Input and reset circuit at U_S)
Cable length	max. 100 m (per input)

Relay outputs: Enabling current paths (13_NO1/14_NO1, 23_NO2/24_NO2, 33_NO3/34_NO3, 43_NO4/44_NO4)	
Number of outputs	4 (1 NO per output)
Output description	safety-related N/O contacts
Switching voltage (see section “Relay data”)	min. 10 V AC/DC max. 250 V AC/DC (Observe the load curve)
Limiting continuous current (see section “Relay data”)	4 A (observe derating)
Inrush current	min. 20 mA max. 6 A
Sq. Total current $I_{TH}^2 = I_1^2 + I_2^2 + ... + I_N^2$	64 A^2 (with 4 x 1-channel, observe derating) 32 A^2 (for 2 x 2-channel, observe derating)
Switching capacity	min. 200 mW
Switching frequency	0.5 Hz
Mechanical service life	40x 10^6 switching cycles
Switching capacity	3 A (250 V (AC15)) 2 A (24 V (DC13))
Output fuse	4 A gL/gG

Times	
Response time	see user manual
Restart time	min. 5 s (Boot time) max. 10 s (Boot time)

General data	
Nominal operating mode	100% operating factor
Degree of protection	IP20
Min. degree of protection of inst. location	IP54
Mounting type	DIN rail mounting
Mounting position	vertical or horizontal
Assembly note	Observe derating
Type of housing	Polyamide PA non-reinforced zinc yellow (RAL 1018)
Operating voltage display	1 x LED (green)
Status display	4 x LED (yellow) 4 x LED (green, red) 1 x LED (green), 2 x LED (orange)
Error indication	2 x LED (red)
Rated surge voltage/insulation	See “Insulation coordination”
Protection class	III
Degree of pollution	2
Overvoltage category	II
Maximum power dissipation for nominal condition	7.07 W
Note on power dissipation	See “Calculating the power dissipation”

Dimensions	Screw connection	Push-in connection
W x H x D	22.61 x 112.58 x 113.6 mm	22.61 x 107.74 x 113.6 mm

Connection data	Screw connection	Push-in connection
Conductor cross-section rigid	0.2 mm² … 2.5 mm²	0.2 mm² … 2.5 mm²
Conductor cross-section flexible	0.2 mm² … 2.5 mm²	0.2 mm² … 2.5 mm²
Conductor cross-section AWG	24 … 12	24 … 14
Stripping length	7 mm	10 mm
Screw thread	M3	
Tightening torque	0.5 Nm … 0.6 Nm	

Ambient conditions	
Ambient temperature (operation)	-10 °C … 55 °C (observe derating)
Ambient temperature (storage/transport)	-20 °C … 85 °C
Max. permissible relative humidity (operation)	95 % (non-condensing)
Max. permissible humidity (storage/transport)	95 % (non-condensing)
Maximum altitude	≤ 2000 m (Above sea level)
Information on operating height	See the “Using PSR devices at altitudes greater than 2000 m above sea level” section
Shock	10g for Δt = 16 ms (continuous shock, 1000 shocks in each space direction)
Vibration (operation)	10 Hz … 150 Hz, amplitude 0.15 mm, 2g

Conformance/Approvals

Content of the EU Declaration of Conformity:
The product conforms with the most important requirements of the following directive(s) and their modification directives:
- 2006/42/EC Machinery Directive
- 2014/30/EU Electromagnetic Compatibility Directive (EMC)

The full EU Declaration of Conformity can be downloaded from the product page at www.phoenixcontact.com/products.

For the latest approvals, please visit www.phoenixcontact.com/products.

Safety data	
Stop category according to IEC 60204	0

Safety parameters in accordance to IEC 61508 - high demand	
IEC 61508 - High-demand for 2-channel wiring	
Equipment type	Type B
HFT	1
SIL	3
PFH_D	1,61 x 10^{-8} (3 A AC15, 8760 switching cycles/year) 3,29 x 10^{-9} (2 A DC13, 8760 switching cycles/year)
Demand rate	< 12 Months
Proof test interval	240 Months
Mission time	240 Months

Safety parameters in accordance to IEC 61508 - high demand	
IEC 61508 - High-demand for 1-channel wiring	
Equipment type	Type B
HFT	0
SIL	1
PFH_D	3,36 x 10^{-7} (3 A AC15, 8760 switching cycles/year) 3.90 x 10^{-9} (2 A DC13, 8760 switching cycles/year)
Demand rate	< 12 Months
Proof test interval	240 Months
Mission time	240 Months

Safety parameters according to EN ISO 13849-1	
Performance level	e (2-channel wiring) c (1-channel wiring)

Safety parameters according to EN IEC 62061	
SIL	3 (2-channel wiring) 1 (1-channel wiring)

5 Interface type (ZVEI classification)

Digital inputs : Reset inputs (FBK1, FBK2, FBK3, FBK4)				
Source/destination	**Interface type**	**Additional measure**	**Source/destination**	**Suitable interface type**
Destination	C0	-	Source	-

Interface type C0 - Destination			
Parameter	**min.**	**typ.**	**max.**
Test pulse duration t_i	-	-	250 ms
Test pulse interval T	0.5 s	-	-
Input resistance R	1.8 kΩ	2.4 kΩ	-
Input capacitance C_L	-	47 nF	51 nF
Inductance L_L	-	10 pH	-
Additional measure M	-		

Relay outputs : Enabling current paths 13_NO1/14_NO1, 23_NO2/24_NO2, 33_NO3/34_NO3, 43_NO4/44_NO4				
Source/destination	**Interface type**	**Additional measure**	**Source/destination**	**Suitable interface type**
Source	A	M	Destination	A
Source	C0	M	Destination	-

Interface type A - Source			
Parameter	**min.**	**typ.**	**max.**
Switching current I_i	20 mA	-	4 A
Switching voltage U_i	10 V AC/DC	-	250 V AC/DC
Internal resistance R_i (in the switched state)	Load 6 A < 50 mΩ	-	Load 20 mA < 10 Ω
Load capacitance C_L	-	-	see switching capacity
Inductive load L_L	-	-	see switching capacity
Electrical isolation	yes		
Additional measure M	- The outputs are not types in accordance with IEC 61131-2.		

Interface type C0 - Source			
Parameter	**min.**	**typ.**	**max.**
Test pulse duration t_i	-	-	-
Test pulse interval T	-	-	-
Nominal current I_N	-	-	4 A
Load capacitance C_L	-	-	see switching capacity
Inductive load L_L	-	-	see switching capacity
Additional measure M	- The outputs are not types in accordance with IEC 61131-2. - No test pulses are emitted at the output.		

6 Notes regarding documentation

6.1 Identification of warning notes



This symbol indicates hazards that could lead to personal injury.

There are three signal words indicating the severity of a potential injury.

DANGER Indicates a hazard with a high risk level. If this hazardous situation is not avoided, it will result in death or serious injury.

WARNING Indicates a hazard with a medium risk level. If this hazardous situation is not avoided, it could result in death or serious injury.

CAUTION Indicates a hazard with a low risk level. If this hazardous situation is not avoided, it could result in minor or moderate injury.



This symbol together with the **NOTE** signal word warns the reader of actions that might cause property damage or a malfunction.



Here you will find additional information or detailed sources of information.

6.2 Validity

This data sheet is valid for the described product(s) from the hardware/firmware version specified in the technical data.

6.3 Target group

This data sheet is therefore aimed at:

– Qualified personnel who plan and design safety equipment for machines and systems and are familiar with regulations governing occupational safety and accident prevention.
– Qualified personnel who install and operate safety equipment in machines and systems.

Qualified personnel:

Qualified personnel are people who, because of their education, experience, and instruction and their knowledge of relevant standards, regulations, accident prevention, and service conditions, have been authorized by those responsible for the safety of the system to carry out any required operations and who are able to recognize and avoid any possible dangers.

Requirements:

Knowledge of the following topics is required:

– Handling safety components
– Valid EMC regulations
– Valid regulations governing occupational safety and accident prevention

7 Safety regulations and installation notes

WARNING: Death, serious personal injury or damage to equipment

Depending on the application, incorrect handling of the device may pose serious risks for the user or cause damage to equipment.

- Observe all the safety notes and warning instructions provided in this chapter and elsewhere in this document.

NOTE: Electrostatic discharge!

Electrostatic discharge can damage or destroy components.

- When handling the device, observe the necessary safety precautions against electrostatic discharge (ESD) in accordance with EN 61340-5-1 and IEC 61340-5-1.

Direct/indirect contact

- Protection against direct and indirect contact according to VDE 0100 Part 410 must be ensured for all components connected to the system.

In the event of an error, parasitic voltages must not occur (single-fault tolerance).

Power supply units for 24 V supply

- Only use power supply units with safe isolation and SELV/PELV.
- Protect the 24 V area with a suitable external fuse.
- Make sure that the power supply unit is able to supply **four times** the nominal current of the external fuse, to ensure that it trips in the event of an error.
- Make sure that the output voltage of the voltage supply does not exceed 32 V even in the event of error.

Startup, mounting, and modifications

Startup, mounting, modifications, and upgrades may only be carried out by qualified personnel.

- Before working on the device, disconnect the power.
- Ensure that the device is disconnected from the power supply.
- Carry out wiring according to the application. Refer to the “Application examples” section for this.

Reliable operation is only ensured if the device is installed in housing protected from dust and humidity.

- Install the device in housing protected from dust and humidity (min. IP54).

Mismatching and polarity reversal of connections

- Take measures to prevent mismatching, polarity reversal, and manipulation of connections.

In operation

During operation, parts of electrical switching devices carry hazardous voltages.

- Protective covers must not be removed when operating electrical switching devices.

For emergency stop applications, automatic startup of the machine can pose serious risks for the user.

- The machine must be prevented from restarting automatically by a higher-level controller.

With the manual, monitored reset device, a machine start may not be triggered in accordance with EN ISO 13849-1.

Inductive loads can destroy the outputs.

- Connect a suitable and effective protective circuit to inductive loads.
- Implement the protective circuit parallel to the load and not parallel to the switch contact.

EMC notes

The device is a Class A product.

- Observe the requirements for noise emission for electrical and electronic equipment (EN 61000-6-4).
- Implement appropriate precautions against noise emission.

Faulty devices

The devices may be damaged following an error. Correct operation can no longer be ensured.

- In the event of an error, replace the device.

Only the manufacturer or their authorized representative may perform the following activities. Otherwise the warranty is invalidated.

– Repairs to the device
– Opening the housing

Replacing the device

- Dispose of the device in the following circumstances:

– At the end of its mission time

ℹ See “Technical data” section.

– In the event of a fault

7.1 Safety of machines or systems

Draw up and implement a safety concept

The machine or system manufacturer and the operator are responsible for the safety of the machine or system and the application in which the machine or system is used. In order to use the device described in this document, you must have drawn up an appropriate safety concept for your machine or system. This includes a risk assessment in accordance with the directives and standards specified in the EC Declaration of Conformity, as well as other standards.

Risk assessment, validation and function test

- Before using the device, perform a risk assessment on the machine or system.
- Validate your entire safety system.
- Carry out a new validation every time you make a safety-related modification.
- Perform a function test on a regular basis.

Achievable safety integrity

The functional safety is ensured for the device as a single component. However, this does not guarantee functional safety for the entire machine or system. In order to be able to achieve the desired safety level for the entire machine or system, define the safety requirements for the machine or system as well as how to implement them from both a technological and an organizational perspective.

8 Transport, storage, and unpacking

8.1 Transport

The device is delivered in cardboard packaging.

- Observe the instructions on how to handle the package indicated on the packaging.

Suitable transport packaging

- Only transport the device in its original packaging or in packaging suitable for transport.

Technical data and environmental conditions

- For transport, observe the humidity and air pressure specifications, and the temperature range.
  See Section “Technical data”.

8.2 Storage

Suitable storage location

The storage location must meet the following requirements:

– Dry
– Protected against unauthorized access
– Protected against harmful environmental influences such as UV light

Technical data and environmental conditions

- For storage, observe the humidity and air pressure specifications, and the temperature range.
  See Section “Technical data”.

8.3 Unpacking

The device is delivered in packaging together with a packing slip that provides installation instructions.

Observing the packing slip

- Read the entire packing slip carefully.
- Retain the packing slip.

Checking the delivery

- Check the delivery for damage and completeness.
- Submit any claims for transport damage immediately.

Scope of supply

Refer to the ordering data for the standard scope of supply for the product.
See Section “Ordering data”.

9 Function description

9.1 Reset/FBK inputs

The extension module has 4 independent inputs that are configured as the feedback circuit for monitoring external actuators, such as contactors with forced guidance.

The inputs can also be configured with a manual reset function.

Reset/FBK inputs are specifically assigned to the outputs:

FBK1 is assigned to output 13–14 (NO1) and FBK2 is assigned to output 23–24 (NO2), etc.

9.2 Safe relay outputs

The module has 4 relay outputs. The outputs are controlled after the incoming signals have been evaluated in accordance with the configuration.

The relay outputs can be configured as follows:

– 4 x 1-channel (category 1)
– 4 x 1-channel with OTE (category 2)
– 2 x 2-channel (category 4)

In particular, observe the additional requirements when using category 2 in accordance with EN ISO 13849-1.

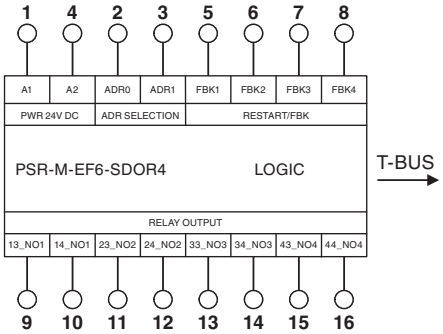
9.3 TBUS interface

The device is equipped with a TBUS interface for connection to a PSR-M-B1, PSR-M-B2 or PSR-M-B3 base module.

Connect a maximum of 14 extension modules to one basic module.

10 Block diagram

Figure 1 Block diagram



Key:

A1	24 V DC supply connection
A2	0 V supply connection
ADR0/ADR1	Module address
13_NO1/14_NO2 ... 43_NO1/44_NO1	Safe relay outputs
FBK1 ... FBK4	Feedback/reset input or programmable digital output – configurable

Inputs ADR0 and ADR1 are used to assign a unique address to the extension module and additional extension modules of the same type in accordance with the following table.

Address	ADR0	ADR1
Address 0	0 V DC (or not connected)	0 V DC (or not connected)
Address 1	24 V DC	0 V DC (or not connected)
Address 2	0 V DC (or not connected)	24 V DC
Address 3	24 V DC	24 V DC

10.1 Insulation coordination

	Logic	Load current paths	Housing
Logic	-	4 KV, VI*	4 KV, VI*
Load current paths		2,5 kV BI	4 KV, VI*
Housing	-	-	-

Key:

Logic	A1, A2, ADR0, ADR1, FKB1, FBK2, FBK3, FBK4, TBUS
Load current paths	13_NO1/14_NO2 ... 43_NO1/44_NO1
BI	Basic insulation at overvoltage category II
VI*	Reinforced insulation at overvoltage category II

WARNING: loss of electrical safety

Take measures outside the device to limit transient surge voltages to the respective value for overvoltage category II.

Basic insulation

(rated surge voltage 2.5 kV)

A mixture of SELV/PELV and low voltage is strictly prohibited.

11 Derating

The temperature is measured at a 5 cm clearance below or to the side of the device.

During assembly, ensure that there is a distance of 22.5 mm to either side (free TBUS slot).

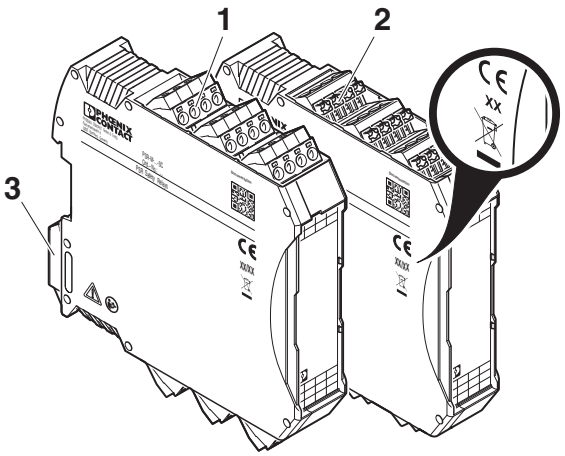
11.1 Vertical or horizontal mounting position

– The module can be operated at an ambient temperature of maximum 55°C at ≤ 24 V DC.
– With a rated control supply voltage ≤ 28.8 V DC, a maximum ambient temperature of 40° is permitted.
– Mounting on a vertical or horizontal DIN rail

12 Operating and indication elements

12.1 Connection versions

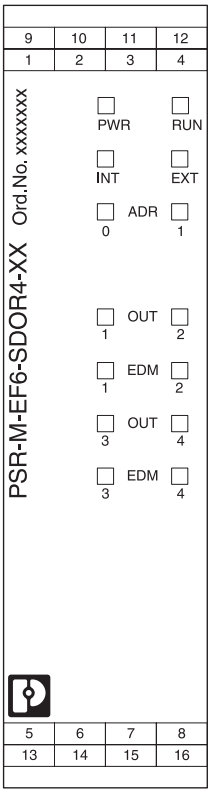
Figure 2 Connection versions



1 Pluggable screw terminal block
2 Pluggable Push-in terminal block
3 Metal lock for fixing to DIN rail

The year the device was constructed can be found underneath the CE designation on the housing.

12.2 Indication elements



Designation	Color	Function/status indicator
PWR	Green	Diagnostic indicator for the power supply
RUN	Green	Operating status indicator
INT	Red	Diagnostic indicator for internal errors
EXT	Red	Diagnostic indicator for external errors
ADR0, ADR1	Orange	Status indicator for the module address
OUT1 ... OUT4	Red / Green	Status indicators for external start and feedback signals (FBK1 ... FBK4)
EDM1 ... EDM4	Yellow	Status indicators for external start and feedback signals

12.3 Optional terminal coding

The device connection terminal blocks are **not** coded as standard.

The optional coding accessories can provide you with increased safety against connection mismatching and reverse polarity.
See section “Ordering data”.

If you do not use the coding accessories, ensure that alternative validation measures are taken.

Coding system

The terminal blocks can be coded by using coding sections and coding profiles.

Coding sections are plugged onto the terminal block header in the device housing.

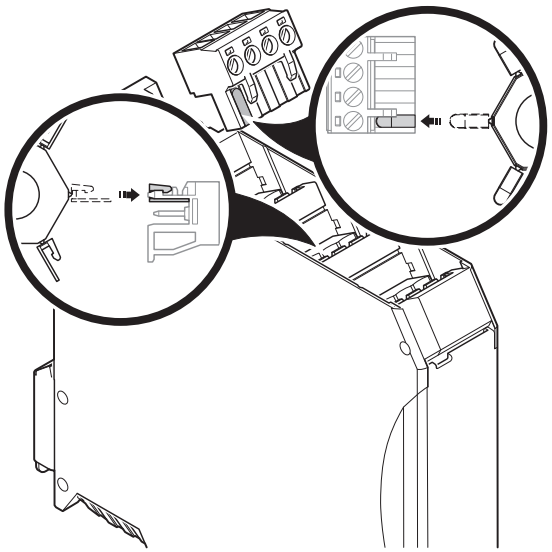
Coding profiles are plugged into the groove of the pluggable terminal block.

Various combinations can be used to create a coding system for the device terminal blocks.

Attaching coding elements

1. Push a coding section onto the terminal block header in the device housing.
   Remove the coding section from the coding star.
2. Push a coding profile into the groove of the terminal block.
   Remove the coding profile from the coding star.

Figure 3 Attach coding elements



13 Mounting and removing

Assembly and disassembly are described in the PSRmodular system manual.

14 Wiring

- Connect the suitable actuators to the safe digital outputs OUT1 ... OUT4.

Figure 4 Connecting the cables for PSR-...-SC (screw terminal block)

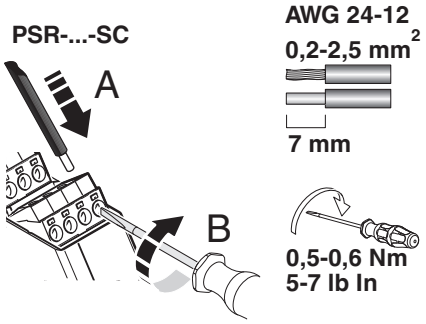
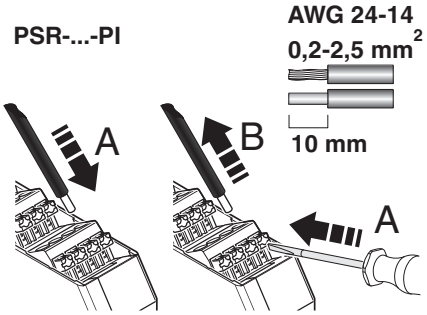


Figure 5 Connecting the cables for PSR-...-PI (Push-in terminal block)



It is recommended that ferrules are used to connect stranded cables.

Use the CRIMPFOX 6 crimping tool from Phoenix Contact.

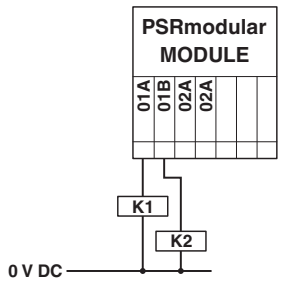
The tool enables the reliable processing of ferrules and easy removal of conductors with ferrules from the connection terminal blocks.

For compliance with UL approval, use copper wire that is approved up to 60°C/75°C.

14.1 Connection versions

- Connect suitable actuators to relay outputs 13–14 (NO1) ... 43–44 (NO4).

Figure 6 Connection version with actuators



1 2-channel monitoring of external contactors

14.2 Start and feedback circuit connection variants

Automatic start

- Autostart without monitored contact extension is parameterized using the PSRmodular Software.

Manual, monitored start

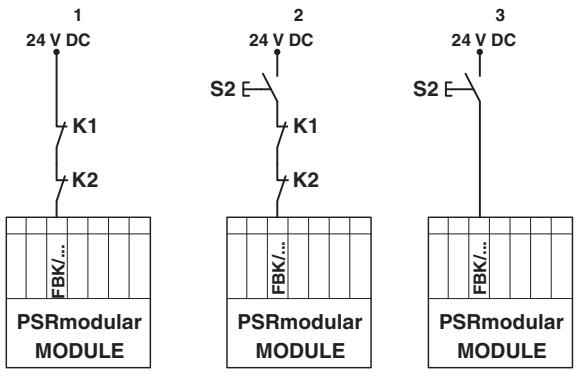
- Connect a reset button.

A connected reset button is monitored.

Start and feedback circuit

- Place the relevant N/C contacts in the feedback circuit to monitor external contactors or extension devices with force-guided contacts.

Figure 7 Start and feedback circuit connection variants



1 Automatic start with monitored contact extension

2 Manual, monitored start with monitored contact extension

3 Manual, monitored start

15 Startup

- Startup is described in the PSRmodular system manual.

16 Calculating the power dissipation

The total power dissipation of the safety module is based on the input power dissipation and the contact power dissipation for the same and for different load currents.

Power dissipation of the logic (A1/A2, 24 V/0 V)

P_{Logic} = 720 mW

Power dissipation per secure node address input (ADR0, ADR1)

P_{ADR} = 16 mW

Power dissipation per feedback/RESTART input (FBK1 ... FBK4)

$P_{FBK/RESTART}$ = 240 mW

Power dissipation per safe output (O1A, O1B, O2A, O2B, O3A, O3B, O4A, O4B)

$P_O = I_O * 1.2\ V + 42\ mW$

Total power dissipation of all safe outputs (O1A + O1B + O2A + O2B + O3A + O3B + O4A + O4B)

$P_{O_Total} = (I_{O1A} + I_{O1B} + I_{O2A} + I_{O2B} + I_{O3A} + I_{O3B} + I_{O4A} + I_{O4B}) \bullet 1{,}2\ V + (d \bullet 42\ mW)$

Total power dissipation of the module

$P_{Total} = P_{Logic} + a \bullet P_{ADR} + b \bullet P_{FBK/RESTART} + P_{MO_Total} + P_{O_Total}$

Key:

P	Power dissipation
P_{Logic}	Power dissipation of the logic via A1/A2
P_{ADR}	Power dissipation per address input
$P_{FBK/RESTART}$	Power dissipation per feedback/RESTART input
P_{MO}	Power dissipation per signal output
P_{MO_Total}	Total power dissipation of all signal outputs
P_O	Power dissipation per safe output
P_{O_Total}	Total power dissipation of all safe outputs
I_{MO}	Current drawn at a signal output
I_O	Current drawn at a safe output
a	Number of activated address inputs
b	Number of feedback/RESTART inputs used
c	Number of signal outputs used
d	Number of safe outputs used

17 Function test/proof test

WARNING: Risk of injury or damage to equipment due to unintentional system states or incorrect responses

The safety module is in the startup phase, i.e., unintentional system states or incorrect responses cannot be ruled out.

- Make sure that triggering the safety demand does not endanger people or equipment.
- Do not enter any hazardous areas and make sure that no other persons can access the danger zone either.

Implementation:

After the project has been successfully loaded on the base module, perform a function test to ensure the correct execution of the safety logic and all of the cabling.

18 Diagnostics

Plausibility errors are deleted when the supply voltage is switched off (power down reset).

In the event of an error or fault that is not listed, please contact Phoenix Contact.

Key:

○ LED OFF
● LED ON
☀ LED flashing slowly
✹ LED flashing quickly

18.1 Diagnostic indicators for initialization/configuration phase

LED status						Meaning
RUN	INT	EXT	ADR0 ... ADR1	OUT1... OUT4	EDM1 ... EDM4	
green	red	red	orange	red/green	yellow	
○	○	○	○	○	○	Device is switched off, no power supply at A1/ A2
●	●	●	●	●	●	Switching on - start-up test

18.2 Status indicators under normal operating conditions

LED status						Meaning
RUN	INT	EXT	ADR0 ... ADR1	OUT1... OUT4	EDM1 ... EDM4	
green	red	red	orange	red/green	yellow	
○ waiting for base module communication ☀ if no input is configured in the software ● Normal operation	○ Method of operation OK	○ Method of operation OK	Status ADR	● red when OFF ● green when ON	● in expectation of RESTART ☀ Feedback from external contactors incorrect	Normal operation

18.3 Diagnostic indicators and troubleshooting

Key:

- ○ LED OFF
- ● LED ON
- ✹ LED flashing slowly
- ✹ LED flashing quickly

LED status						Meaning	Corrective
RUN	**INT**	**EXT**	**ADR0 ... ADR1**	**OUT 1 ... 4**	**EDM1 ... EDM4**		
green	**red**	**red**	**orange**	**red/green**	**yellow**		
○	2 x ✹ or 3 x ✹	○	Indicates the physical address of the module	● red	○	Internal defect	Send the module to be repaired.
○	5 x ✹	○	Indicates the physical address of the module	5 x ✹	5 x ✹	Compatibility error	Firmware version is not compatible with base module, send in for firmware update.
○	4 x ✹	○	Indicates the physical address of the module	4 x ✹ (only for affected faulty output)	○	OUT error	Check applicable outputs – if the problem continues, send the module out for repair
○	5 x ✹	○	Indicates the physical address of the module	○	○	Error during communication with the basic module, faulty addressing	Restart the system – if the problem continues, send the module out for repair, change the module address in accordance with the configuration
○	●	○	Indicates the physical address of the module	○	○	Error on another extension module or basic module or error when communicating with the basic module	
○	5 x ✹	5 x ✹	Indicates the physical address of the module	○	○	Extension modules of the same type detected	Change module addresses
●	○	4 x ✹	Indicates the physical address of the module	4x ✹ red (only for affected faulty output)	4x ✹	Error in the FBK input	Check the wiring of the the FBK inputs, check connected actuators, and replace if necessary
○	3 x ✹	○	3 x ✹	○	○	Error in addressing circuit	Send module in for repair.

19 Application example

19.1 General application information for the PSR-modular system

WARNING: Loss of safety function or damage to the device

The use of unsuitable power supplies and the incorrect connection of the power supply can result in the loss of the safety function or damage to the device.

- Observe the following information

System level

– All the reference grounds of a PSRmodular system must be connected together. This also applies to the reference ground of connected sensors.

Module level

– Make sure that the supply voltage of the FBK inputs is not higher than the communications power at A1/A2. Ideally, use the same power supply unit.

19.2 Emergency stop monitoring/manual, monitored and automatic start (autostart)

Application description:

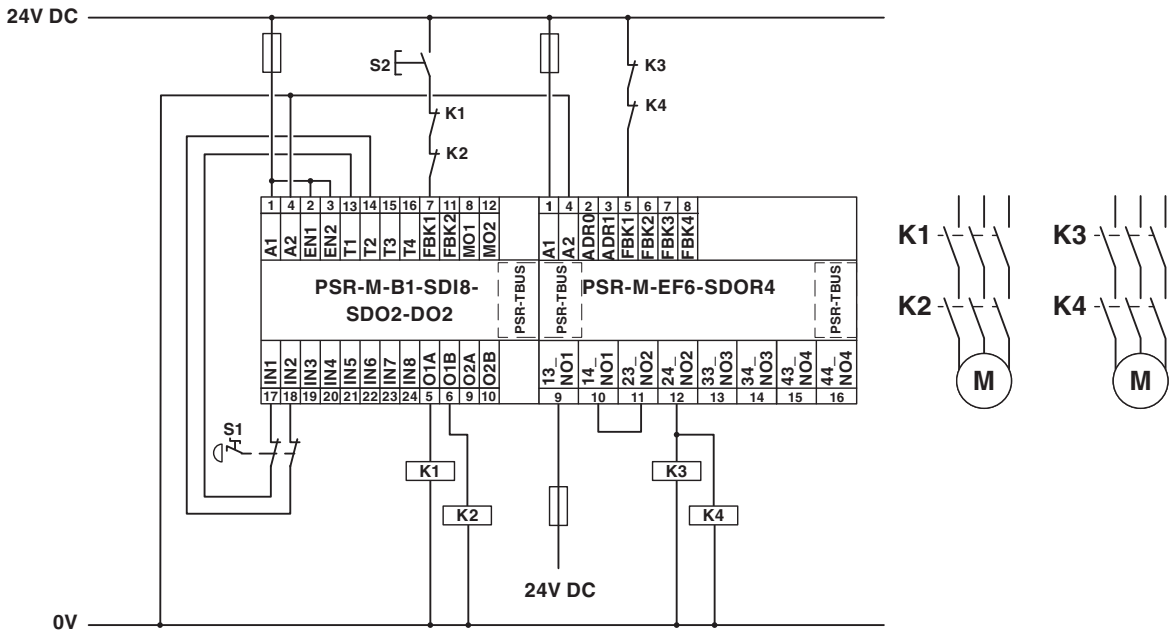
– 2-channel emergency stop monitoring
– Manual, monitored start (K1/K2)
– Automatic start (K3/K4)
– With cross-circuit detection in the sensor circuit
– Monitoring of external, force-guided contactors

Achievable safety integrity:

– Suitable up to category 4, PL e (EN ISO 13849-1), SIL 3 (EN IEC 62061), if cross-circuits in the control to K3/K4 can be ruled out

Cross-circuits in the cable installation can be excluded if the extension module and external contactors K1 ... K4 are located in the same electrical installation space.

Figure 8 Emergency stop monitoring/manual, monitored and automatic start (autostart)



Key:

S1	Emergency stop button
S2	Manual reset device
K1 ... K4	Force-guided contactors

20 Device replacement, device defect, and repair

20.1 Device replacement

The device can be replaced, if necessary.

If you need to replace the device, proceed as described in the following section:

– Mounting and removal
– Wiring

Observe the device type and version

The new device must meet the following requirements:

– Same device type
– Same or later version

20.2 Device defect and repair

Do not open the housing

Repairs may only be carried out by Phoenix Contact. Do not open the housing. If the housing is opened, the function of the device can no longer be ensured.

Faulty devices

- Please contact Phoenix Contact.

21 Maintenance, decommissioning, and disposal

21.1 Maintenance

The device requires no maintenance during the permissible mission time. Refer to the technical data for the mission time of the device.

See “Technical data” section.

Depending on the application and connected I/O devices, you should test the function of the I/O devices and the safety chain regularly.

Observe the relevant manufacturer specifications for carrying out maintenance on connected I/O devices.

21.2 Decommissioning and disposal

Carry out decommissioning according to the requirements of the machine or system manufacturer.

When decommissioning the system or parts of the system, ensure the following for the devices used.

The device continues to be used only as intended:

- Observe the storage and transport requirements.

See “Transport, storage, and unpacking” section.

The device is not used any more:

The symbol with the crossed-out trash can indicates that this item must be collected and disposed of separately from other waste.
Phoenix Contact or public collection sites will take the item back for free disposal. For information on the available disposal options, visit www.phoenixcontact.com.

Packaging disposal

- Dispose of packaging materials that are no longer needed (cardboard packaging, paper, bubble wrap sheets, pillow bags, etc.) with household waste in accordance with the currently applicable national regulations.

22 Attachment

22.1 Using PSR devices at altitudes greater than 2000 m above sea level

Using the device at altitudes **> 2000 m amsl up to max. 4500 m amsl** is possible under the following conditions:

1. Limit the rated control circuit supply voltage (U_S) in accordance with the table below. Observe the technical data for the device.

U_S according to the technical data for the device	**U_S when used at altitudes greater than 2000 m above sea level**
< 150 V AC/DC	U_S according to the technical data for the device still valid
> 150 V AC/DC	Limited to max. 150 V AC/DC

2. Limit the maximum switching voltage in accordance with the table below. Observe the technical data for the device.

Max. switching voltage according to the technical data for the device	**Max. switching voltage when used at altitudes greater than 2000 m above sea level**
< 150 V AC/DC	Max. switching voltage according to the technical data for the device still valid
> 150 V AC/DC	Limited to max. 150 V AC/DC

3. Reduce the maximum ambient temperature for operation by the corresponding factor in accordance with the table below.
4. If derating is specified, offset all the points of the derating curve by the corresponding factor in accordance with the table below.

Altitude above sea level	**Temperature derating factor**
2000 m	1
2500 m	0.953
3000 m	0.906
3500 m	0.859
4000 m	0.813
4500 m	0.766

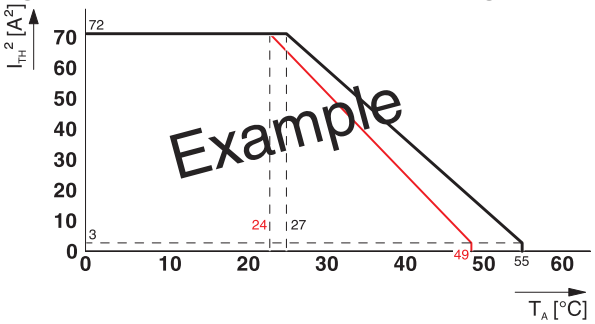
Example calculation for 3000 m

The following calculation and the illustrated derating curve are provided as examples.
Perform the actual calculation and offset the derating curve for the device used according to the technical data and the “Derating” section.

27 °C • 0.906 ≈ 24 °C

55 °C • 0.906 ≈ 49 °C

Figure 9 Example of a suspended derating curve (red)



22.2 Revision history

Version	Date	Contents
00	2020-03-26	First publication
01	2021-05-06	Safety-related characteristics correction
02	2025-08-21	Section “Technical data": Cable length, supply added; suppressor diode removed; "Safety regulations and installation instructions" section: Specification on SELV/ PELV voltage changed; "Maintenance, decommissioning and disposal" section: Disposal note changed. Section “Block diagram”: warning note modified. “Interface type (ZVEI classification)” section added, front image changed in “Operating and indication elements” section, notes on connecting the cables added to “Wiring” section; "Application examples" section revised.