

PSR-M-B1-SDI8-SDO2-DO2-PI - Safety module



1104972

<https://www.phoenixcontact.com/us/products/1104972>

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Configurable safety module (basic module), 8 safe inputs, 2 safe outputs, 2 reset inputs, 2 signal outputs, 4 clock outputs, can be extended via TBUS, up to SIL 3, Cat. 4/PL e, plug-in Push-in terminal block, TBUS connector not included

Product Description

The configurable and individually scalable PSRmodular safety system is a flexible safety solution for monitoring your machine or system. The freely configurable base module is used to monitor various pieces of safety equipment such as emergency stop, safety doors, and light grids. The base module has safe inputs and outputs, as well as signal outputs and clock outputs.

Your advantages

- Cost-effective safety solution with a high level of adaptability to individual requirements
- Fast startup, thanks to easy hardware and software configuration
- Machine downtimes minimized with comprehensive, easy-to-understand diagnostics
- Flexible extension with safe inputs and outputs
- Possibility of connecting fieldbus gateways for bidirectional communication between the base module and the higher-level controller
- Narrow housing width of just 22.6 mm
- Tool-free and time-saving installation thanks to Push-in technology
- Up to Cat. 4/PL e in accordance with EN ISO 13849-1, SIL 3 in accordance with IEC 62061, SIL 3 in accordance with IEC 61508
- Suitable for elevator applications in accordance with EN 81-20

Commercial Data

| | |
|--------------------------------------|---------------|
| Item number | 1104972 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales Key | DN02 |
| Product Key | DNA361 |
| GTIN | 4055626967592 |
| Weight per Piece (including packing) | 177.9 g |
| Weight per Piece (excluding packing) | 151.64 g |
| Customs tariff number | 85371098 |
| Country of origin | IT |

Technical Data

Product properties

| | |
|--------------|----------------|
| Product type | Safety device |
| Application | Emergency stop |
| | Light grid |
| | Safety door |
| | Safe shutdown |

Insulation characteristics

| | |
|------------------|----------------|
| Protection class | III (EN 50178) |
|------------------|----------------|

Times

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

Electrical properties

| | |
|---|---|
| Maximum power dissipation for nominal condition | 6.24 W (with max. permissible load) |
| Nominal operating mode | 100% operating factor |
| Interfaces | DIN rail TBUS for connection to the master module, not supplied as standard |

Air clearances and creepage distances between the power circuits

| | |
|--------------------------------|---|
| Rated insulation voltage | 250 V AC |
| Rated surge voltage/insulation | Basic insulation 4 kV between all current paths and housing |

Supply

| | |
|--|--|
| Designation | A1/A2 |
| Rated control circuit supply voltage U_S | 19.2 V DC ... 28.8 V DC |
| Rated control circuit supply voltage U_S | 24 V DC -20 % / +20 % (external fuse, typically 4 A) |
| Rated control supply current I_S | typ. 55 mA (Outputs inactive) |
| | typ. 70 mA (Outputs active, without load) |
| Power consumption at U_S | typ. 1.32 W (Outputs inactive) |
| Inrush current | 9.5 A ($\Delta t = 1$ ms at U_S) |
| Filter time | typ. 5 ms (at A1 in the event of voltage dips at U_S) |
| Protective circuit | Inverse-parallel protection against polarity reversal |
| | Suppressor diode |

Input data

Digital: IN1, IN2, IN3, IN4, IN5, IN6, IN7, IN8

| | |
|--------------------------------|-------------------------------|
| Description of the input | Safety-related digital inputs |
| | EN 61131-2 type 1 |
| Number of inputs | 8 |
| Input voltage range "0" signal | 0 V DC ... 5 V DC |

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| | |
|---|--|
| Input voltage range "1" signal | 15 V DC ... 28.8 V DC |
| Input current range "0" signal | < 1 mA |
| Filter time | min. 3 ms ±2 ms (adjustable) |
| | max. 250 ms ±2 ms (adjustable) |
| | Test pulse rate ≥ 2x set filter time, min. Test pulse rate = 10 ms |
| Cable length | max. 100 m (per input) |
| Max. permissible overall conductor resistance | max. 1.2 kΩ (Input and reset circuit at U _S) |
| Protective circuit | Suppressor diode |
| Current consumption | typ. 8 mA (typically with U _S) |
| | max. 10 mA (at a control voltage of 28.8 V DC) |

Digital: Reset inputs (FBK1, FBK2)

| | |
|---|---|
| Description of the input | IEC 61131-2 type 3 |
| | non-safety-related (configurable) |
| Number of inputs | 2 |
| Input voltage range "0" signal | 0 V DC ... 5 V DC |
| Input voltage range "1" signal | 11 V DC ... 28.8 V DC |
| Input current range "0" signal | < 1 mA |
| Filter time | 250 ms ±2 ms (Test pulse rate > 500 ms) |
| Cable length | max. 100 m (per input) |
| Max. permissible overall conductor resistance | 1.2 kΩ (Input and reset circuit at U _S) |
| Protective circuit | Suppressor diode |
| Current consumption | typ. 10 mA (typically with U _S) |
| | max. 13 mA (at a control voltage of 28.8 V DC) |

Digital: Enable inputs (EN1, EN2)

| | |
|---|---|
| Number of inputs | 2 |
| Input voltage range "0" signal | 0 V DC ... 5 V DC |
| Input voltage range "1" signal | 8 V DC ... 28.8 V DC |
| Input current range "0" signal | < 0.2 mA |
| Filter time | 100 ms ±2 ms (Test pulse duration) |
| | > 1 s (Test pulse rate) |
| Cable length | max. 100 m (per input) |
| Max. permissible overall conductor resistance | max. 12 kΩ |
| Protective circuit | Suppressor diode |
| Current consumption | typ. 0.7 mA (typically with U _S) |
| | max. 1 mA (at a control voltage of 28.8 V DC) |

Output data

Digital: O1A, O1B, O2A, O2B

| | |
|--------------------|--|
| Output description | Safety-related digital outputs |
| | PNP, OSSD |
| | IEC 61131-2 type 0.5 (observe limiting continuous current) |
| Number of outputs | 4 (can be used as 2 two-channel outputs) |

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| | |
|----------------------------------|--|
| Protective circuit | Suppressor diode |
| Short-circuit protection | Yes (self-limitation at 1.1 A) |
| Leakage current | max. 500 µA |
| Cable length | max. 100 m (per output) |
| Ohmic load | min. 50 Ω (Observe limiting continuous current) |
| Max. capacitive load | max. 680 nF |
| Max. inductive load | max. 1.4 mH |
| Limiting continuous current | 400 mA (per channel) |
| | 1.6 A (Total current of all safe digital outputs) |
| Inrush current | max. 750 mA ($\Delta t \leq 1$ s) |
| Nominal output voltage | 24 V DC (Supply via A1) |
| Nominal output voltage range | 18 V DC ... 27.6 V DC ($U_S - 1.2$ V) |
| Switching frequency | max. $1/4 \times t_{\text{Cycle}}$ [Hz] |
| Output voltage when switched off | < 1.5 V |
| Test pulses | < 80 µs (Test pulse width of low test pulses) |
| | Test pulse rate for low test pulses > 2 x T_{Cycle} |
| | < 20 µs (Test pulse width, high test pulse) |
| | ≥ 1.5 s (Test pulse rate, high test pulse) |
| Discharging circuit | Yes, internal |

Signal: MO1, MO2

| | |
|----------------------------------|--|
| Output description | PNP, IEC 61131-2 Typ 0,1 |
| | non-safety-related |
| Number of outputs | 2 |
| Output voltage when switched off | max. 0.1 V |
| Voltage | 24 V DC (via A1) |
| Maximum inrush current | 1.1 A ($\Delta t = 3$ s at U_S) |
| Limiting continuous current | 100 mA (per channel) |
| | 200 mA (Total current of all digital signal outputs) |
| Leakage current | max. 100 µA |
| Switching frequency | max. $1/4 \times t_{\text{Cycle}}$ [Hz] |
| Protective circuit | Suppressor diode |
| Short-circuit protection | Yes (self-limitation at 1.1 A) |
| Cable length | max. 100 m (per output) |

Clock: T1, T2, T3, T4

| | |
|----------------------------------|---------------------------------------|
| Output description | PNP, IEC 61131-2 type 0.5 |
| Number of outputs | 4 |
| Voltage | 24 V DC (via A1) |
| Output voltage when switched off | max. 0.1 V |
| Maximum inrush current | 1.1 A ($\Delta t = 3$ s at U_S) |
| Limiting continuous current | 100 mA (per channel) |
| | 400 mA (Total current of all outputs) |
| Leakage current | max. 100 µA |
| Test pulses | ≤ 220 µs (Test pulse duration) |

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| | |
|--------------------------|--|
| | Test pulse rate = $8 \times t_{\text{Cycle}}$ [ms] |
| Short-circuit protection | Yes (self-limitation at 1.1 A) |
| Cable length | max. 100 m (per output) |
| Max. capacitive load | max. 470 nF |
| Max. inductive load | max. 2.4 mH |
| Discharging circuit | Yes, internal |

Connection data

Connection technology

| | |
|-----------|-----|
| pluggable | yes |
|-----------|-----|

Conductor connection

| | |
|----------------------------------|---|
| Connection method | Push-in connection |
| Conductor cross section rigid | 0.2 mm ² ... 2.5 mm ² |
| Conductor cross section flexible | 0.2 mm ² ... 2.5 mm ² |
| Conductor cross-section AWG | 24 ... 16 |
| Stripping length | 10 mm |

Signaling

| | |
|---------------------------|---|
| Status display | 1 x LED (green), 1 x LED (orange), 1 x LED (blue) |
| | 2 x LED (green, red) |
| | 12 x LED (yellow) |
| Operating voltage display | 1 x green LED |
| Error indication | 2 x LED (red) |

Dimensions

| | |
|--------|-----------|
| Width | 22.61 mm |
| Height | 107.74 mm |
| Depth | 113.6 mm |

Material specifications

| | |
|------------------|-----------------------------|
| Housing material | Polyamide PA non-reinforced |
|------------------|-----------------------------|

Characteristics

Safety data

| | |
|---------------|---|
| Stop category | 0 |
|---------------|---|

Safety data: EN ISO 13849

| | |
|------------------------|----------------------|
| Performance level (PL) | e (2-channel wiring) |
| | d (1-channel wiring) |

Safety data: IEC 61508 - High-demand for 2-channel wiring

| | |
|---|-----------------------|
| Equipment type | Type B |
| Safety Integrity Level (SIL) | 3 |
| Probability of a hazardous failure per hour (PFH _D) | 6.86×10^{-9} |

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| | |
|---|--|
| Proof test interval | 240 Months |
| Duration of use | 240 Months |
| Integrity requirement | IEC 61508 - High-demand for 1-channel wiring |
| Equipment type | Type B |
| Safety Integrity Level (SIL) | 2 |
| Probability of a hazardous failure per hour (PFH _D) | 6.86 x 10 ⁻⁹ |
| Proof test interval | 240 Months |
| Duration of use | 240 Months |

Environmental and real-life conditions

Ambient conditions

| | |
|--|--|
| Degree of protection | IP20 |
| Min. degree of protection of inst. location | IP54 |
| Ambient temperature (operation) | -10 °C ... 55 °C (observe derating) |
| Ambient temperature (storage/transport) | -20 °C ... 85 °C |
| Maximum altitude | ≤ 2000 m (Above sea level) |
| Max. permissible humidity (storage/transport) | 95 % (non-condensing) |
| Max. permissible relative humidity (operation) | 95 % (non-condensing) |
| Shock | 10g for Δt = 16 ms (continuous shock, 1000 shocks in each space direction) |
| Vibration (operation) | 10 Hz ... 150 Hz, 2g |

Approvals

CE

| | |
|----------------|--------------|
| Identification | CE-compliant |
|----------------|--------------|

Mounting

| | |
|-----------------------|------------------------|
| Mounting type | DIN rail mounting |
| Assembly instructions | Observe derating |
| Mounting position | vertical or horizontal |
| Connection method | Push-in connection |

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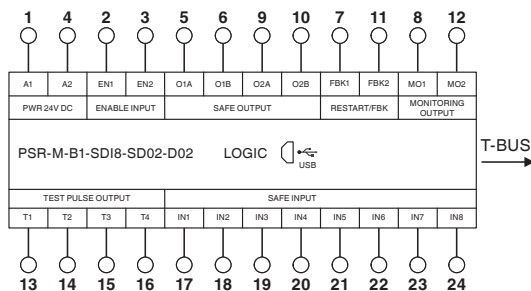


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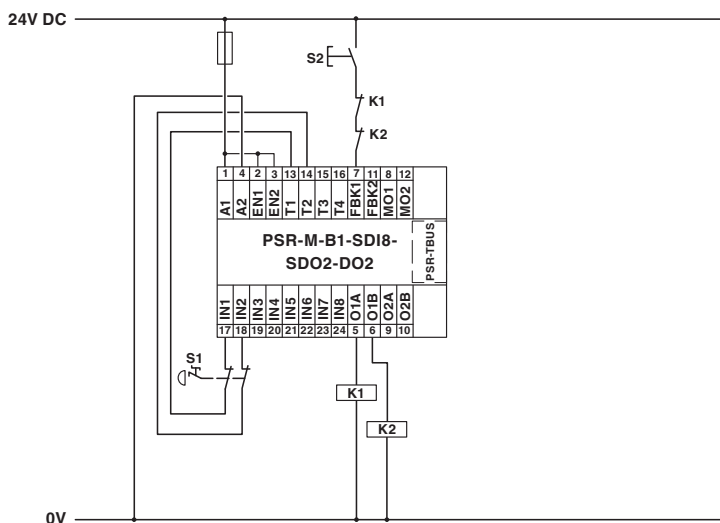
Drawings

Block diagram



Block diagram

Application drawing




Example application

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Approvals

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UL Listed

Approval ID: FILE E 238705



cUL Listed

Approval ID: FILE E 238705



EAC

Approval ID: RU*-DE*B.00606/20

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Classifications

ECLASS

| | |
|-------------|----------|
| ECLASS-11.0 | 27371819 |
| ECLASS-13.0 | 27371819 |
| ECLASS-12.0 | 27371819 |

ETIM

| | |
|----------|----------|
| ETIM 8.0 | EC001449 |
|----------|----------|

UNSPSC

| | |
|-------------|----------|
| UNSPSC 21.0 | 39122200 |
|-------------|----------|

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Environmental Product Compliance

| | |
|------------|---|
| China RoHS | Environmentally friendly use period: unlimited = EFUP-e |
| | No hazardous substances above threshold values |

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Accessories

CP-MSTB - Coding profile

1734634

<https://www.phoenixcontact.com/us/products/1734634>

Coding profile, is inserted into the slot on the plug or inverted header, red insulating material



CR-MSTB - Coding section

1734401

<https://www.phoenixcontact.com/us/products/1734401>

Coding section, inserted into the recess in the header or the inverted plug, red insulating material



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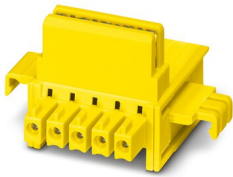
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ME 22,5 TBUS 1,5/ 5-ST-3,81 YE - DIN rail bus connectors

2200244

<https://www.phoenixcontact.com/us/products/2200244>

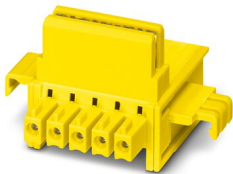


DIN rail connector, color: yellow, nominal current: 8 A (parallel contacts), rated voltage (III/2): 125 V, number of positions: 5, pitch: 3.81 mm, mounting: DIN rail mounting, locking: without, mounting: without, type of packaging: packed in cardboard, Item with gold-plated contacts, bus connectors for connecting with electronics housings, 5 parallel contacts

ME 22,5 TBUS 1,5/ 5-ST-3,81 YE - 1PCS - DIN rail bus connectors

1225375

<https://www.phoenixcontact.com/us/products/1225375>



DIN rail connector, nominal current: 8 A (parallel contacts), rated voltage (III/2): 125 V, number of positions: 5, pitch: 3.81 mm, color: yellow, mounting: DIN rail, item with gold-plated contacts, bus connector for connecting to electronics housings, 5 parallel contacts

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PSR-M-MEMORY - Configuration memory

1105142

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Optional memory block for the PSRmodular system for easy storage and backup of configuration data

PSR-FTB/1.5/11.5 - Filter terminal block

2904476

<https://www.phoenixcontact.com/us/products/2904476>



Terminal block for filtering test pulses from safe semiconductor outputs with adjustable filter values (1.5 μ F/11.5 μ F), as well as for EMC filtering of 24 V signals up to an amperage of 2 A.

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PSR-FTB/20/86 - Filter terminal block

2904477

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Terminal block for filtering test pulses from safe semiconductor outputs with adjustable filter values (20 μ F/86 μ F), as well as for EMC filtering of 24 V signals up to an amperage of 2 A.

CABLE-USB/MINI-USB-3,0M - USB cable

2986135

<https://www.phoenixcontact.com/us/products/2986135>

USB connecting cable: USB plug type A to USB plug type Mini-B; length: 3 m



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