

# PSR-M-B1-SDI8-SDO2-DO2-SC - Safety module



1104981

<https://www.phoenixcontact.com/us/products/1104981>

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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 screw 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
- 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	1104981
Packing unit	1 pc
Minimum order quantity	1 pc
Sales Key	DN02
Product Key	DNA361
GTIN	4055626971865
Weight per Piece (including packing)	191.5 g
Weight per Piece (excluding packing)	159 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
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### 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 $\pm$ 2 ms (adjustable)
	max. 250 ms $\pm$ 2 ms (adjustable)
	Test pulse rate $\geq$ 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 k $\Omega$ (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 $\pm$ 2 ms (Test pulse rate > 500 ms)
Cable length	max. 100 m (per input)
Max. permissible overall conductor resistance	1.2 k $\Omega$ (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 $\pm$ 2 ms (Test pulse duration)
	> 1 s (Test pulse rate)
Cable length	max. 100 m (per input)
Max. permissible overall conductor resistance	max. 12 k $\Omega$
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 $\mu$ A
Cable length	max. 100 m (per output)
Ohmic load	min. 50 $\Omega$ (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 $\mu$ s (Test pulse width of low test pulses)
	Test pulse rate for low test pulses > 2 x $T_{\text{Cycle}}$
	< 20 $\mu$ s (Test pulse width, high test pulse)
	$\geq 1.5$ 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 $\mu$ A
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 $\mu$ A
Test pulses	$\leq 220$ $\mu$ s (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
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### Conductor connection

Connection method	Screw connection
Conductor cross section rigid	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross section flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section AWG	24 ... 12
Stripping length	7 mm
Screw thread	M3
Tightening torque	0.5 Nm ... 0.6 Nm

## 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	112.58 mm
Depth	113.6 mm

## Material specifications

Housing material	Polyamide PA non-reinforced
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## Characteristics

### Safety data

Stop category	0
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### 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
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Safety Integrity Level (SIL)	3
Probability of a hazardous failure per hour (PFH <sub>D</sub> )	6.86 x 10 <sup>-9</sup>
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 <sub>D</sub> )	6.86 x 10 <sup>-9</sup>
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
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## Mounting

Mounting type	DIN rail mounting
Assembly instructions	Observe derating
Mounting position	vertical or horizontal
Connection method	Screw connection

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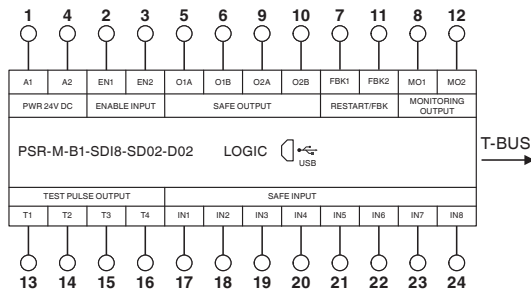


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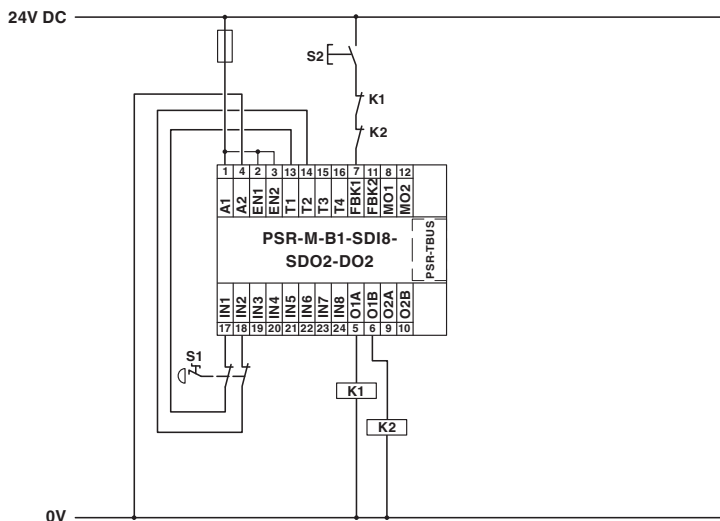
## Drawings

Block diagram



Block diagram

Application drawing



Example application

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## Approvals

🔗 To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1104981>



**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
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### 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



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### CR-MSTB - Coding section

1734401

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



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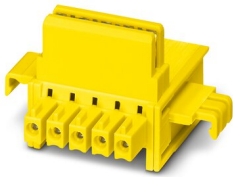
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## ME 22,5 TBUS 1,5/ 5-ST-3,81 YE - DIN rail bus connectors

2200244

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



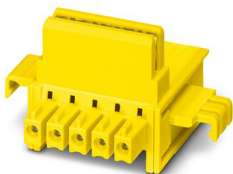
DIN rail connector, color: yellow, nominal current: 8 A (parallel contacts), rated voltage (III/2): 125 V, number of positions: 5, pitch: 3.81 mm, mounting: DIN rail mounting, locking: without, mounting: without, type of packaging: packed in cardboard, Item with gold-plated contacts, bus connectors for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

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## 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

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## PSR-FTB/1.5/11.5 - Filter terminal block

2904476

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Terminal block for filtering test pulses from safe semiconductor outputs with adjustable filter values (1.5  $\mu$ F/11.5  $\mu$ 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

<https://www.phoenixcontact.com/us/products/2904477>



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

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## 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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