

Safety module - PSR-M-B1-SDI8-SDO2-DO2-SC - 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 SILCL 3, Cat. 4/PL e, SIL 3, 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

- ✓ Economical safety solution with a high level of adaptability to individual requirements
- ✓ Fast startup, thanks to easy hardware and software configuration
- ✓ Machine downtime 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
- ✓ Low housing width of only 22.5mm
- ✓ Up to Cat. 4/PL e according to ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508
- ✓ Suitable for lift applications according to EN 81-20



Key Commercial Data

Packing unit	1 pc
GTIN	
GTIN	4055626971865

Technical data

Dimensions

Width	22.5 mm
Height	112.2 mm
Depth	114.5 mm

Ambient conditions

Ambient temperature (operation)	-10 °C ... 55 °C (observe derating)
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Safety module - PSR-M-B1-SDI8-SDO2-DO2-SC - 1104981

Technical data

Ambient conditions

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)

Power supply

Designation	A1/A2
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)
Current consumption	max. 4 A (with full 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

Digital inputs

Input name	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
Input voltage range "1" signal	15 V DC ... 28.8 V DC
Input current range "0" signal	< 1 mA
Current consumption	typ. 8 mA (typically with U_s)
	max. 10 mA (at a control voltage of 28.8 V DC)
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
Max. permissible overall conductor resistance	max. 1.2 kΩ (Input and reset circuit at U_s)
Cable length	max. 100 m (per input)
Protective circuit/component	Suppressor diode
Input name	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

Safety module - PSR-M-B1-SDI8-SDO2-DO2-SC - 1104981

Technical data

Digital inputs

Current consumption	typ. 10 mA (typically with U_S)
	max. 13 mA (at a control voltage of 28.8 V DC)
Filter time	250 ms $\pm$ 2 ms (Test pulse rate > 500 ms)
Max. permissible overall conductor resistance	1.2 k Ω (Input and reset circuit at U_S)
Cable length	max. 100 m (per input)
Protective circuit/component	Suppressor diode
Input name	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
Current consumption	typ. 0.7 mA (typically with U_S)
	max. 1 mA (at a control voltage of 28.8 V DC)
Protective circuit/component	Suppressor diode

Digital outputs

Output name	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)
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)
Limiting continuous current	400 mA (per channel)
	1.6 A (Total current of all safe digital outputs)
Inrush current	max. 750 mA (Δt # 1 s)
Output voltage when switched off	< 1.5 V
Leakage current	max. 500 μ A
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
Switching frequency	max. $1/4 \times t_{\text{Cycle}}$ [Hz]
Test pulses	< 80 μ s (Test pulse width of low test pulses)
	Test pulse rate for low test pulses > $2 \times T_{\text{Cycle}}$
	< 20 μ s (Test pulse width, high test pulse)
	≥ 1.5 s (Test pulse rate, high test pulse)
Protective circuit/component	Suppressor diode
Short-circuit protection	Yes (self-limitation at 1.1 A)
Error detection time at 1-channel structure	< 3.5 s (OFF state)
	< $4 \times t_{\text{Cycle}}$ [ms] (ON state)

Safety module - PSR-M-B1-SDI8-SDO2-DO2-SC - 1104981

Technical data

Digital outputs

Discharging circuit	Yes, internal
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Alarm outputs

Designation	MO1, MO2
Output description	PNP, IEC 61131-2 Typ 0,1
	non-safety-related
Number of outputs	2
Voltage	24 V DC (via A1)
Output voltage range	18.2 V DC ... 27.8 V DC ($U_S - 1\text{ V}$)
Output voltage when switched off	max. 0.1 V
Maximum inrush current	1.1 A ($\Delta t = 3\text{ s}$ at U_S)
Switching frequency	max. $1/4 \times t_{\text{cycle}}$ [Hz]
Limiting continuous current	100 mA (per channel)
	200 mA (Total current of all digital signal outputs)
Leakage current	max. 100 μA
Protective circuit/component	Suppressor diode
Short-circuit protection	Yes (self-limitation at 1.1 A)
Cable length	max. 100 m (per output)

Clock outputs

Designation	T1, T2, T3, T4
Output description	PNP, IEC 61131-2 type 0.5
Number of outputs	4
Voltage	24 V DC (via A1)
Nominal voltage range	18.2 V DC ... 27.8 V DC ($U_S - 1\text{ V}$)
Output voltage when switched off	max. 0.1 V
Maximum inrush current	1.1 A ($\Delta t = 3\text{ s}$ at U_S)
Limiting continuous current	100 mA (per channel)
	400 mA (Total current of all outputs)
Leakage current	max. 100 μA
Cable length	max. 100 m (per output)
Max. capacitive load	max. 470 nF
Max. inductive load	max. 2.4 mH
Test pulses	$\leq 220\text{ }\mu\text{s}$ (Test pulse duration)
	Test pulse rate = $8 \times t_{\text{cycle}}$ [ms]
Protective circuit/component	Suppressor diode
Short-circuit protection	Yes (self-limitation at 1.1 A)
Discharging circuit	Yes, internal

Times

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

Safety module - PSR-M-B1-SDI8-SDO2-DO2-SC - 1104981

Technical data

Times

	max. 10 s (Boot time)
Cycle time	see user manual

General

Nominal operating mode	100% operating factor
Net weight	159 g
Mounting position	vertical or horizontal
Mounting type	DIN rail mounting
Assembly instructions	Observe derating
Degree of protection	IP20
Min. degree of protection of inst. location	IP54
Protection class	III (EN 50178)
Housing material	Polyamide PA non-reinforced
Housing color	yellow
Operating voltage display	1 x green LED
Status display	1 x LED (green), 1 x LED (orange), 1 x LED (blue)
	2 x LED (green, red)
	12 x LED (yellow)
Indication	2 x LED (red)

Connection data

Connection method	Screw connection
pluggable	Yes
Conductor cross section solid	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 ... 12
Stripping length	7 mm
Screw thread	M3
Torque	0.5 Nm ... 0.6 Nm

Safety-related characteristic data

Stop category	0
Designation	IEC 61508 - High-demand for 2-channel wiring
Safety Integrity Level (SIL)	3
Designation	IEC 61508 - High-demand for 1-channel wiring
Safety Integrity Level (SIL)	2
Designation	EN ISO 13849
Performance level (PL)	e (2-channel wiring)
	d (1-channel wiring)
Category	4 (2-channel wiring)
Designation	EN 62061
Safety Integrity Level Claim Limit (SIL CL)	3 (2-channel wiring)

Safety module - PSR-M-B1-SDI8-SDO2-DO2-SC - 1104981

Technical data

Safety-related characteristic data

	2 (1-channel wiring)
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Standards and Regulations

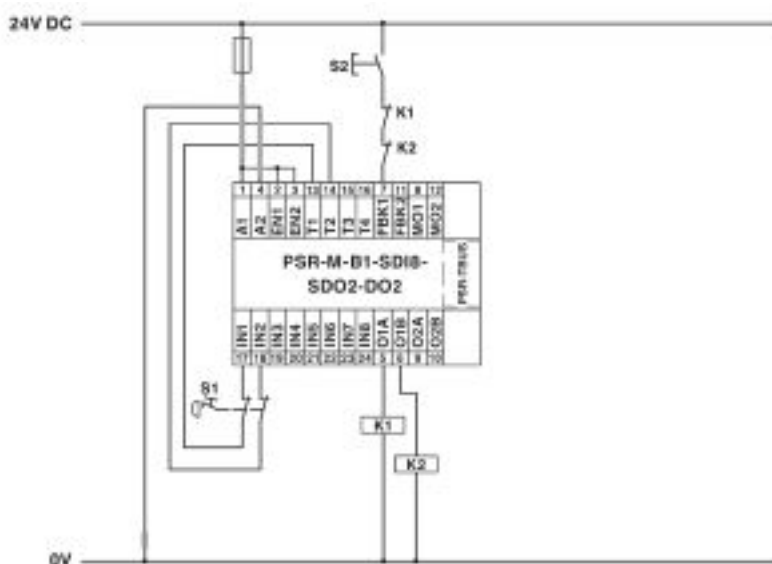
Designation	Air clearances and creepage distances between the power circuits
Standards/regulations	EN 50178
Rated insulation voltage	250 V AC
Rated surge voltage/insulation	Basic insulation 4 kV between all current paths and housing
Degree of pollution	2
Overvoltage category	II
Shock	10g for $\Delta t = 16$ ms (continuous shock, 1000 shocks in each space direction)
Vibration (operation)	10 Hz ... 150 Hz, 2g
Conformance	CE-compliant

Environmental Product Compliance

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

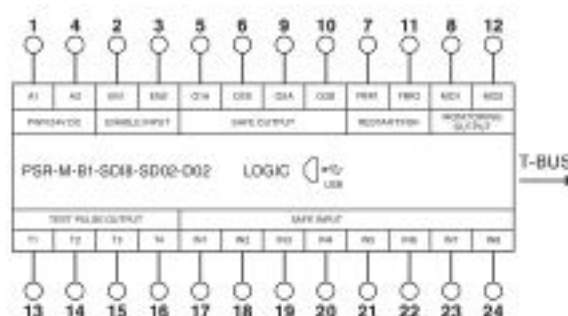
Drawings

Application drawing



Safety module - PSR-M-B1-SDI8-SDO2-DO2-SC - 1104981

Block diagram



Classifications

eCl@ss

eCl@ss 10.0.1	27371819
eCl@ss 8.0	27371819
eCl@ss 9.0	27371819

ETIM

ETIM 5.0	EC001449
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Approvals

Approvals

Approvals

UL Listed / cUL Listed / cULus Listed

Ex Approvals

Approval details

UL Listed		http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm	FILE E 238705
cUL Listed		http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm	FILE E 238705
cULus Listed			

Safety module - PSR-M-B1-SDI8-SDO2-DO2-SC - 1104981

Accessories

Accessories

Coding element

Coding profile - CP-MSTB - 1734634



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

Coding section - CR-MSTB - 1734401



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

Configuration memory

Configuration memory - PSR-M-MEMORY - 1105142



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

DIN rail connector

DIN rail bus connectors - ME 22,5 TBUS 1,5/ 5-ST-3,81 YE - 2200244



DIN rail connector, nominal current: 8 A, 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 connectors for connecting with electronics housings, 5 parallel contacts

DIN rail bus connectors - ME 22,5 TBUS 1,5/ 5-ST-3,81 YE - 1PCS - 1225375



DIN rail connector, number of positions: 5, pitch: 3.81 mm, color: yellow

Safety module - PSR-M-B1-SDI8-SDO2-DO2-SC - 1104981

Accessories

Filter terminal block

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

Filter terminal block - PSR-FTB/20/86 - 2904477



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.

Programming cable

USB cable - CABLE-USB/MINI-USB-3,0M - 2986135



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

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PHOENIX CONTACT GmbH & Co. KG
Flachsmarktstr. 8
32825 Blomberg
Germany
Tel. +49 5235 300
Fax +49 5235 3 41200
<http://www.phoenixcontact.com>

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