

PSR-M-EF8-SDI8-SDO2-DO2-PI - Extension module



1105523

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Safe extension module with 8 safe inputs and 2 safe outputs, 2 reset inputs, 2 signal outputs, 4 clock outputs, TBUS interface, up to SIL 3, Cat. 4/PL e, pluggable Push-in terminal block, TBUS connector included

Product description

The configurable and individually scalable PSRmodular safety system is a flexible safety solution for monitoring your machine or system. The safe extension module provides the system additional safe inputs and outputs as well as signal 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
- Tool-free and time-saving installation thanks to Push-in technology
- Narrow housing width of just 22.6 mm
- Up to Cat. 4/PL e in accordance with ISO 13849-1, SIL 3 in accordance with EN IEC 62061, SIL 3 in accordance with IEC 61508
- Suitable for elevator applications in accordance with EN 81-20

Commercial data

Item number	1105523
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DN02
Product key	DNA362
GTIN	4055626988313
Weight per piece (including packing)	174.4 g
Weight per piece (excluding packing)	141 g
Customs tariff number	85371098
Country of origin	IT

Technical data

Notes

Note on application

Note on application	Only for industrial use
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Product properties

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

Data management status

Article revision	00
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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	5.88 W (with max. permissible load)
Nominal operating mode	100% operating factor
Interfaces	DIN rail TBUS for connection to the master module, supplied as standard

Air clearances and creepage distances

Rated insulation voltage	250 V AC
Rated surge voltage/insulation	Basic insulation 4 kV between 24 V power supply and I/Os to the 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 % (provide external protection, typically 8 A)
Rated control supply current I_S	typ. 40 mA (Outputs inactive)
	typ. 55 mA (Outputs active, without load)
Power consumption at U_S	typ. 0.96 W (Outputs inactive)
Inrush current	< 9 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	Serial 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
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 Ω (Input and reset circuit at U_S)
Protective circuit	Suppressor diode
Current consumption	typ. 8 mA (typ. 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
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 Ω (Input and reset circuit at U_S)
Protective circuit	Suppressor diode
Current consumption	typ. 10 mA (typ. with U_S)
	max. 13 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)
Protective circuit	Suppressor diode
Short-circuit protection	Yes (self-limitation at 1.1 A)
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

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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 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)
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 μ 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 μ A
Test pulses	≤ 220 μ s (Test pulse duration) Test pulse rate = $8 \times t_{\text{Cycle}}$ [ms]
Protective circuit	Suppressor diode
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

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Discharging circuit	Yes, internal
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Connection data

Connection technology

pluggable	yes
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Conductor connection

Connection method	Push-in connection
Conductor cross section rigid	0.2 mm² ... 2.5 mm²
Conductor cross section flexible	0.2 mm² ... 2.5 mm²
Conductor cross-section AWG	24 ... 14
Stripping length	10 mm

Signaling

Status display	1 x LED (green), 2 x LED (orange)
	12 x LED (yellow)
	2 x LED (green, red)
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

Color (Housing)	yellow (RAL 1018)
Housing material	Polyamide PA non-reinforced

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

Safety Integrity Level (SIL)	3
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Safety data: IEC 61508 - High-demand for 1-channel wiring

Safety Integrity Level (SIL)	2
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Safety data: EN IEC 62061

Safety Integrity Level (SIL)	3 (2-channel wiring)
	2 (1-channel wiring)

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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 $\Delta t = 16$ 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 note	Observe derating
Mounting position	vertical or horizontal

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Application drawing

The application drawing illustrates the connection of two PSR-M-B1-SDI8-SDO2-DO2 modules. The modules are connected to a 24V DC supply and a 0V ground. The connections are as follows:

- 24V DC:** Connected to pins A1, A2, EN1, EN2, T1, T2, T3, T4, FBK1, FBK2, MO1, and MO2 of both modules.
- 0V:** Connected to pins IN1, IN2, IN3, IN4, IN5, IN6, IN7, IN8, OT1, OT2, O2A, and O2B of both modules.
- S1:** Connected to pins IN1, IN2, IN3, IN4, IN5, IN6, IN7, IN8, OT1, OT2, O2A, and O2B of the left module.
- S2:** Connected to pins A1, A2, EN1, EN2, T1, T2, T3, T4, FBK1, FBK2, MO1, and MO2 of the left module.
- K1:** Connected to pins IN1, IN2, IN3, IN4, IN5, IN6, IN7, IN8, OT1, OT2, O2A, and O2B of the left module.
- K2:** Connected to pins IN1, IN2, IN3, IN4, IN5, IN6, IN7, IN8, OT1, OT2, O2A, and O2B of the left module.
- K3:** Connected to pins IN1, IN2, IN3, IN4, IN5, IN6, IN7, IN8, OT1, OT2, O2A, and O2B of the right module.
- K4:** Connected to pins IN1, IN2, IN3, IN4, IN5, IN6, IN7, IN8, OT1, OT2, O2A, and O2B of the right module.

Block diagram

The block diagram illustrates the PSR-M-EF8-SDI8-SDO2-DO2 logic. It features 24 pins, numbered 1 through 24, arranged in two rows. The top row contains pins 1, 4, 2, 3, 5, 6, 9, 10, 7, 11, 8, and 12. The bottom row contains pins 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, and 24. The pins are connected to various functions as follows:

- Pins 1-4:** PWR 24V DC
- Pins 5-8:** ADDR SELECTION
- Pins 9-12:** SAFE OUTPUT
- Pins 13-16:** TEST PULSE OUTPUT
- Pins 17-20:** IN1, IN2, IN3, IN4
- Pins 21-24:** IN5, IN6, IN7, IN8
- Pins 10, 11, 12:** FBK1, FBK2, MO1, MO2
- Pins 1, 2, 3, 4:** MONITORING OUTPUT

The diagram also shows a T-BUS connection to the right of the block.

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Approvals

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UL Listed

Approval ID: E238705



cUL Listed

Approval ID: E238705



EAC

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



Functional Safety

Approval ID: Z10 029429 0013

cULus Listed

Classifications

ECLASS

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

ETIM

ETIM 9.0	EC001449
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UNSPSC

UNSPSC 21.0	39122200
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Environmental product compliance

EU RoHS	
Fulfills EU RoHS substance requirements	Yes, No exemptions
China RoHS	
Environment friendly use period (EFUP)	EFUP-E
	No hazardous substances above the limits
EU REACH SVHC	
REACH candidate substance (CAS No.)	No substance above 0.1 wt%

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