

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
- Low 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
Control	1 and 2 channel

Insulation characteristics

Protection class	III
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Insulation characteristics

Overvoltage category	II
Degree of pollution	2

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
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

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)
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)
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 x 2 channel outputs)
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
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 ($\Delta t \leq \text{⏏}$ s)

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Nominal output voltage	24 V DC (Supply via A1)
Nominal output voltage range	18 V DC ... 27.6 V DC ($U_S - 1.2 \text{ V}$)
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 > $2 \times T_{\text{Cycle}}$
	< 20 μs (Test pulse width, high test pulse)
	$\geq 1.5 \text{ s}$ (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
Output voltage range	18.2 V DC ... 27.8 V DC ($U_S - 1 \text{ V}$)
Voltage	24 V DC (via A1)
Maximum inrush current	1.1 A ($\Delta t = 3 \text{ s}$ at U_S)
Limiting continuous current	100 mA (per channel)
	200 mA (Total current of all digital signal outputs)
Leakage current	max. 100 μA
Ohmic load	min. 180 Ω (Observe limiting continuous current)
Switching frequency	max. $1/4 \times t_{\text{Cycle}}$ [Hz]
Short-circuit protection	Yes (self-limitation at 1.1 A)
Discharging circuit	No
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 ($\Delta t = 3 \text{ s}$ at U_S)
Limiting continuous current	100 mA (per channel)
	400 mA (Total current of all outputs)
Leakage current	max. 100 μA
Test pulses	$\leq 220 \mu\text{s}$ (Test pulse duration)
	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

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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 LED (green)
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)
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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

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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 wiring for two PSR-M-B1-SDI8-SDO2-DO2 modules. The power supply is 24V DC, with a common 0V ground. The modules are connected to various control signals (S1, S2, K1, K2, K3, K4) and power lines. The modules are labeled PSR-M-B1-SDI8-SDO2-DO2 and PSR-M-EF8-SDI8-SDO2-DO2.

Module Pinout:

Pin	Signal
1	A1
2	A2
3	EN1
4	EN2
5	T1
6	T2
7	T3
8	T4
9	FBK1
10	FBK2
11	MO1
12	MO2

Module Pinout:

Pin	Signal
1	A1
2	A2
3	ADR0
4	ADR1
5	T1
6	T2
7	T3
8	T4
9	FBK1
10	FBK2
11	MO1
12	MO2

Module Pinout:

Pin	Signal
1	IN1
2	IN2
3	IN3
4	IN4
5	IN5
6	IN6
7	IN7
8	IN8
9	OT1A
10	OT1B
11	O2A
12	O2B

Module Pinout:

Pin	Signal
1	IN1
2	IN2
3	IN3
4	IN4
5	IN5
6	IN6
7	IN7
8	IN8
9	OT1A
10	OT1B
11	O2A
12	O2B

Module Pinout:

Pin	Signal
1	IN1
2	IN2
3	IN3
4	IN4
5	IN5
6	IN6
7	IN7
8	IN8
9	OT1A
10	OT1B
11	O2A
12	O2B

Module Pinout:

Pin	Signal
1	IN1
2	IN2
3	IN3
4	IN4
5	IN5
6	IN6
7	IN7
8	IN8
9	OT1A
10	OT1B
11	O2A
12	O2B

Module Pinout:

Pin	Signal
1	IN1
2	IN2
3	IN3
4	IN4
5	IN5
6	IN6
7	IN7
8	IN8
9	OT1A
10	OT1B
11	O2A
12	O2B

Module Pinout:

Pin	Signal
1	IN1
2	IN2
3	IN3
4	IN4
5	IN5
6	IN6
7	IN7
8	IN8
9	OT1A
10	OT1B
11	O2A
12	O2B

Module Pinout:

Pin	Signal
1	IN1
2	IN2
3	IN3
4	IN4
5	IN5
6	IN6
7	IN7
8	IN8
9	OT1A
10	OT1B
11	O2A
12	O2B

Module Pinout:

Pin	Signal
1	IN1
2	IN2
3	IN3
4	IN4
5	IN5
6	IN6
7	IN7
8	IN8
9	OT1A
10	OT1B
11	O2A
12	O2B

Module Pinout:

Pin	Signal
1	IN1
2	IN2
3	IN3
4	IN4
5	IN5
6	IN6
7	IN7
8	IN8
9	OT1A
10	OT1B
11	O2A
12	O2B

Module Pinout:

Pin	Signal
1	IN1
2	IN2
3	IN3
4	IN4
5	IN5
6	IN6
7	IN7
8	IN8
9	OT1A
10	OT1B
11	O2A
12	O2B

Module Pinout:

Pin	Signal
1	IN1
2	IN2
3	IN3
4	IN4
5	IN5
6	IN6
7	IN7
8	IN8
9	OT1A
10	OT1B
11	O2A
12	O2B

Module Pinout:

Pin	Signal
1	IN1
2	IN2
3	IN3
4	IN4
5	IN5
6	IN6
7	IN7
8	IN8
9	OT1A
10	OT1B

Block diagram

The block diagram illustrates the pin configuration for the PSR-M-EF8-SDI8-SDO2-DO2 logic. The pins are numbered 1 through 24. The functions are 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, 13:** FBK1, FBK2, MO1, MO2
- Pins 14, 15, 16, 17:** MONITORING OUTPUT

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

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Approvals

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cULus Listed

Approval ID: E238705



Functional Safety

Approval ID: Z10029429 0013Rev.02

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Classifications

ECLASS

ECLASS-13.0	27371819
ECLASS-15.0	27371819
ECLASS-15.0 ASSET	27250101

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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