

# Datasheet - PROTECT-IE-11

Input expander / PROTECT-IE



Preferred typ



- Input expander
- Input for up to 4 sensors per interface e.g.: magnetic safety switches type BNS, emergency stop devices, interlocking devices and others
- 2 safety contacts
- Signalling output for each sensor (monitoring of both circuits of the sensors)

(Minor differences between the printed image and the original product may exist!)

## Ordering details

|                          |               |
|--------------------------|---------------|
| Product type description | Protect-IE-11 |
| Article number           | 1184758       |
| EAN code                 | 4030661322599 |

## Approval

Approval



## Classification

|                  |                                                                                                            |
|------------------|------------------------------------------------------------------------------------------------------------|
| Standards        | EN ISO 13849-1, IEC 61508, EN 60947-5-1                                                                    |
| PL               | up d (STOP 0)                                                                                              |
| Control category | up 3 (STOP 0)                                                                                              |
| DC               | > 60% (STOP 0)                                                                                             |
| CCF              | > 65 points                                                                                                |
| PFH value        | $\leq 2 \times 10^{-7}/h$ (STOP 1)                                                                         |
| - notice         | up to max. 36.500 switching cycles/year                                                                    |
| SIL              | up 2 (STOP 0)                                                                                              |
| Mission time     | 20 Years                                                                                                   |
| - notice         | The PFH value is applicable for the combinations listed in the table for contact load (K) (current through |

enabling paths) and switching cycle number (n-op/y).  
 In case of 365 operating days per year and a 24-hour operation, this results in the specified switching cycle times (t-cycle) for the relay contacts.  
 Diverging applications on request.



## Global Properties

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|                                                                                                                        |                                                           |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| Product name                                                                                                           | PROTECT-IE                                                |
| Standards                                                                                                              | IEC/EN 60204-1, EN 60947-5-1, EN ISO 13849-1, IEC 61508   |
| Compliance with the Directives (Y/N)  | Yes                                                       |
| Climatic stress                                                                                                        | EN 60068-2-78                                             |
| Mounting                                                                                                               | snaps onto standard DIN rail to EN 60715                  |
| Terminal designations                                                                                                  | IEC/EN 60947-1                                            |
| Materials                                                                                                              |                                                           |
| - Material of the housings                                                                                             | Plastic, glass-fibre reinforced thermoplastic, ventilated |
| Weight                                                                                                                 | 149 g                                                     |
| Start conditions                                                                                                       | Automatic                                                 |
| Start input (Y/N)                                                                                                      | No                                                        |
| Feedback circuit (Y/N)                                                                                                 | No                                                        |
| Start-up test (Y/N)                                                                                                    | No                                                        |
| Automatic reset function (Y/N)                                                                                         | Yes                                                       |
| Reset with edge detection (Y/N)                                                                                        | No                                                        |
| Pull-in delay                                                                                                          |                                                           |
| - ON delay with automatic start                                                                                        | ≤ 20 ms                                                   |
| Drop-out delay                                                                                                         |                                                           |
| - Drop-out delay in case of emergency stop                                                                             | ≤ 20 ms                                                   |

## Mechanical data

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|                                         |                                       |
|-----------------------------------------|---------------------------------------|
| Connection type                         | Cage clamps                           |
| Cable section                           |                                       |
| - Min. Cable section                    | 0,08 mm <sup>2</sup>                  |
| - Max. Cable section                    | 2.5 mm <sup>2</sup>                   |
| Pre-wired cable                         | rigid or flexible                     |
| Detachable terminals (Y/N)              | No                                    |
| Mechanical life                         | 10.000.000 operations                 |
| Electrical lifetime                     | Derating curve available on request   |
| restistance to shock                    | 30 g / 11 ms                          |
| Resistance to vibration To EN 60068-2-6 | 10...55 Hz, Amplitude 0,35 mm, ± 15 % |

## Ambient conditions

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|                                          |        |
|------------------------------------------|--------|
| Ambient temperature                      |        |
| - Min. environmental temperature         | -25 °C |
| - Max. environmental temperature         | +55 °C |
| Storage and transport temperature        |        |
| - Min. Storage and transport temperature | -40 °C |
| - Max. Storage and transport temperature | +85 °C |
| Protection class                         |        |

|                                                         |                 |
|---------------------------------------------------------|-----------------|
| - Protection class-Enclosure                            | IP20            |
| - Protection class-Terminals                            | IP20            |
| - Protection class-Clearance                            | IP20            |
| Air clearances and creepage distances To IEC/EN 60664-1 |                 |
| - Rated impulse withstand voltage $U_{imp}$             | 800 V           |
| - Overvoltage category                                  | III To VDE 0110 |
| - Degree of pollution                                   | 2 To VDE 0110   |

## Electromagnetic compatibility (EMC)

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|            |                             |
|------------|-----------------------------|
| EMC rating | conforming to EMC Directive |
|------------|-----------------------------|

## Electrical data

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|                                             |                                                    |
|---------------------------------------------|----------------------------------------------------|
| Rated DC voltage for controls               |                                                    |
| - Min. rated DC voltage for controls        | 20.4 V                                             |
| - Max. rated DC voltage for controls        | 28.8 V                                             |
| Rated AC voltage for controls, 50 Hz        |                                                    |
| - Min. rated AC voltage for controls, 50 Hz | 20.4 V                                             |
| - Max. rated AC voltage for controls, 50 Hz | 26.4 V                                             |
| Rated AC voltage for controls, 60 Hz        |                                                    |
| - Min. rated AC voltage for controls, 60 Hz | 20.4 V                                             |
| - Max. rated AC voltage for controls, 60 Hz | 26.4 V                                             |
| Contact resistance                          | max. 100 mΩ                                        |
| Power consumption                           | max. 1.7 W; plus signalling outputs Y1...Y4        |
| Type of actuation                           | DC                                                 |
| Rated operating voltage $U_e$               | 24 VDC -15% / +20%, residual ripple max. 10%       |
| Electronic protection (Y/N)                 | Yes                                                |
| Fuse rating for the operating voltage       | Internal electronic trip, tripping current > 0,1 A |
| Current and tension on control circuits     | 24 VDC, 10 mA                                      |

## Inputs

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|                                    |                                   |
|------------------------------------|-----------------------------------|
| <b>Monitored inputs</b>            |                                   |
| - Short-circuit recognition (Y/N)  | Yes                               |
| - Wire breakage detection (Y/N)    | Yes                               |
| - Earth connection detection (Y/N) | Yes                               |
| Number of shutters                 | 1 piece                           |
| Number of openers                  | 1 piece                           |
| Input resistance                   | approx. 2900 Ω at GND or at $U_e$ |
| Input signal "1"                   | 19 - 28.8 VDC                     |
| Input signal "0"                   | 0 - 1 VDC                         |

## Outputs

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|                                                  |                                                                             |
|--------------------------------------------------|-----------------------------------------------------------------------------|
| Stop category                                    | 0                                                                           |
| Number of safety contacts                        | 2 piece                                                                     |
| Number of auxiliary contacts                     | 0 piece                                                                     |
| Number of signalling outputs                     | 4 piece                                                                     |
| Switching capacity                               |                                                                             |
| - Switching capacity of the safety contacts      | max. 24 VDC, 2 A ohmic (inductive in case of appropriate protective wiring) |
| - Switching capacity of the signaling/diagnostic |                                                                             |

|                                                                            |                                                    |
|----------------------------------------------------------------------------|----------------------------------------------------|
| outputs                                                                    | Y1...Y4: 24 VDC, 0,1 A                             |
| Fuse rating                                                                |                                                    |
| - Protection of the safety contacts                                        | 2 A slow blow                                      |
| - Fuse rating for the signaling/diagnostic outputs                         | Internal electronic trip, tripping current > 0,5 A |
| Utilisation category To EN 60947-5-1                                       | DC-13: 24 V / 2 A                                  |
| Number of undelayed semi-conductor outputs with signaling function         | 4 piece                                            |
| Number of undelayed outputs with signaling function (with contact)         | 1 piece                                            |
| Number of delayed semi-conductor outputs with signaling function.          | 0 piece                                            |
| Number of delayed outputs with signalling function (with contact).         | 0 piece                                            |
| Number of secure undelayed semi-conductor outputs with signaling function  | 0 piece                                            |
| Number of secure, undelayed outputs with signaling function, with contact. | 2 piece                                            |
| Number of secure, delayed semi-conductor outputs with signaling function   | 0 piece                                            |
| Number of secure, delayed outputs with signaling function (with contact).  | 0 piece                                            |

### LED switching conditions display

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|                                                                                                                                                           |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| LED switching conditions display (Y/N)                                                                                                                    | Yes     |
| Number of LED's                                                                                                                                           | 5 piece |
| LED switching conditions display                                                                                                                          |         |
| - The integrated LEDs indicate the following operating states.                                                                                            |         |
| - Position relay K2                                                                                                                                       |         |
| - Position relay K3                                                                                                                                       |         |
| - Position relay K4                                                                                                                                       |         |
| - LED's or signalling outputs signalise an opened protective device or emergency stops.                                                                   |         |
| - Monitoring effected on both contact circuits of the sensor.                                                                                             |         |
| - Position relay K1                                                                                                                                       |         |
| - Supply voltage U <sub>B</sub>                                                                                                                           |         |
| - When the safety guard or the emergency stop circuit is opened, a 24V signal is switched at each output concerned (Y1...Y4) and the assigned LED is lit. |         |

### Miscellaneous data

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|              |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applications |  Emergency-Stop button<br> Pull-wire emergency stop switches<br> Guard system<br> Safety sensor |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dimensions

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|            |        |
|------------|--------|
| Dimensions |        |
| - Width    | 48 mm  |
| - Height   | 126 mm |
| - Depth    | 61 mm  |

## notice

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Inductive loads (e.g. contactors, relays, etc.) are to be suppressed by means of a suitable circuit.

## notice - Wiring example

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**Start level:** Depends on the wiring of the safety relay module.

**Sensor level:** 2-channel control of magnetic safety switches according to EN 60947-5-3

**Output level:** 2-channel control of a downstream safety relay module

The control recognises cross-short, cable break and earth leakages in the monitoring circuit.

If the inputs S1, S3, S5 and S7 are not used, they have to be bridged to +

If the inputs S2, S4, S6 and S8 are not used, they have to be bridged to -

The safety relay modules must be suitable for signal processing for single or dual-channel floating NC-contacts

Start and actuator configuration has to be effected in accordance with the data sheet

The obtainable control category according to EN 954-1 depends on type and wiring of the used safety relay module

Control category 4 to EN 954-1 (when an individual guard door is opened).

Control category 3 to EN 954-1 (upon opening of several guard doors simultaneously).

Output 23/24 is closed in de-energised condition.

The wiring diagram is shown with guard doors closed and in de-energised condition.

## Keywords

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Keywords

Protect

## Documents

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**Wiring example (99)** 19 kB, 22.08.2008

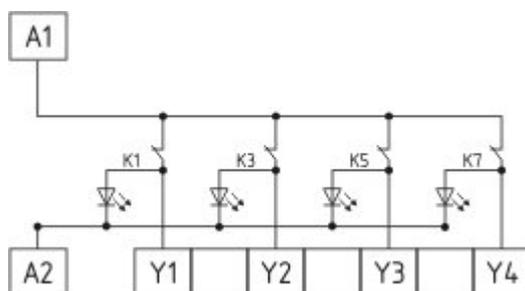
Code: kpriel03

**Wiring example (99)** 11 kB, 22.08.2008

Code: kpriel02

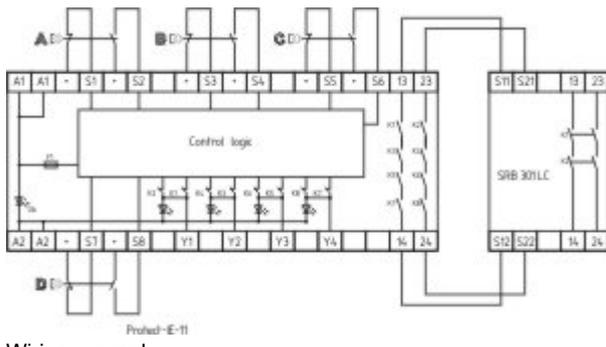
## Images

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Wiring example

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Wiring example

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K.A. Schmersal GmbH, Möddinghofe 30, D-42279 Wuppertal  
 The data and values have been checked thoroughly. Technical modifications and errors excepted.  
 Generiert am 28.09.2011 - 10:36:00h Kasbase 1.5.5 DBI