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# PNOZsigma safety relays



## – range overview

Pilz multi functional PNOZsigma range of compact safety relays are easy to install and expand with improved switching capacity – from as little as 12.5mm wide.

Ideal for machine builders and panel builders, these fourth generation safety relays incorporate a number of features and international approvals (important for export). They also offer significant cost savings because less units now cover a wider range of applications, reducing your stock holding.

A combination of jumper connected expansion modules and spring loaded cage clamp terminals can also reduce your wiring time by up to 20%.

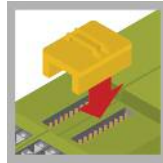
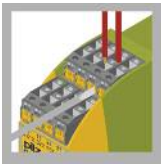
To increase the number of safety outputs use the PNOZsigma expander modules – see page 484.

The safety relays provide diagnostics in seconds using the LED indication panel, displaying:

- Power
- Input status
- Switch status
- Reset
- Fault

### Key features and benefits of the PNOZsigma range

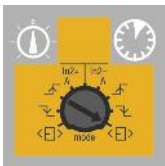
Rapid installations – innovative spring-loaded terminals, chambers operated individually



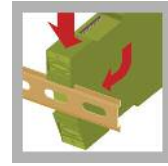
20% reduction in wiring. Contact expansion via connectors



Simple configuration, designation and position of the terminals is the same on all unit types

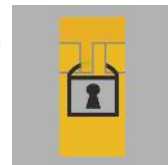
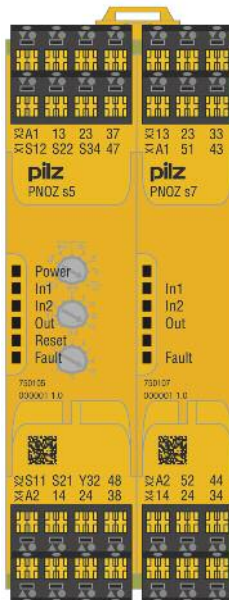
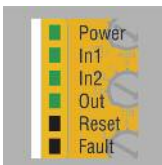


Maximum flexibility. Operating modes and timer functions are selectable



Rapid assembly via spring clips, no need for tools

Diagnostics in seconds via 6 LEDs – no external measuring devices required



Safe from manipulation, setting elements have a lockable cover

# PNOZsigma safety relays



## Technical specification

	PNOZs1	PNOZs2	PNOZs3	PNOZs4	PNOZs5	PNOZs6
Input channels	1	1	1 and 2	2	2	2
Safety outputs	2 NO	3 NO	2 NO	3 NO	2 NO	3 NO
Safety outputs (timed)	—	—	—	—	2 NO	—
Time delay range	—	—	—	—	0-300 seconds	—
Auxiliary outputs	—	1 NC	—	1 NC	—	1 NC
Semi conductor outputs	1	1	1	1	1	1
<i>Input options:</i>						
Emergency stop	◆	◆	◆	◆	◆	—
Safety gate switch	◆	◆	◆	◆	◆	—
Light curtain	—	—	◆	◆	◆	—
Two-hand control	—	—	—	—	—	◆
Reset	Manual	Manual/monitored	Monitored	Manual/automatic	Manual/automatic	Manual
Start	Automatic	Automatic	Start-up test	Start-up test	Start-up test	—
Supply voltage	24V d.c.	24V d.c.	24V d.c.	24V d.c.	24V d.c.	24V d.c.
Universal power supply	—	—	—	48-240V a.c./d.c.	48-240V a.c./d.c.	—
External fast fuse rating	4A	4A	4A	6/10A	6A	6A
Connections	Plug-in	Plug-in	Plug-in	Plug-in	Plug-in	Plug-in
Housing width (mm)	12.5	17.5	17.5	22.5	22.5	22.5
PFH <sub>b</sub>	2 x 10 <sup>-7</sup>	2.5 x 10 <sup>-9</sup>	2.31 x 10 <sup>-9</sup>	2.31 x 10 <sup>-9</sup>	2.31 x 10 <sup>-9</sup>	2.62 x 10 <sup>-9</sup>
PFH <sub>b</sub> (delayed)	—	—	—	—	2.14 x 10 <sup>-9</sup>	—
Safety category	Cat 2	Cat 2	Cat 4	Cat 4	Cat 4	EN574, Typ IIIC
Performance Level	Pld	Pld	PLe	PLe	PLe	PLe
SIL claim	SIL CL2	SIL CL3	SIL CL3	SIL CL3	SIL CL3	SIL CL3

◆ Can be connected



Description	Screw Terminals			Spring-loaded Terminals		
	Ident No	Order Code	List Price	Ident No	Order Code	List Price
PNOZs1	750101	PNOZS124VDC	£102.61	751101	PNOZS1C24VDC	£102.61
PNOZs2	750102	PNOZS224VDC	£121.30	751102	PNOZS2C24VDC	£121.30
PNOZs3	750103	PNOZS324VDC	£125.95	751103	PNOZS3C24VDC	£125.90
PNOZs4	750104	PNOZS424VDC	£163.28	751104	PNOZS4C24VDC	£163.28
PNOZs4, universal voltage	750134	PNOZS4/48-240VAC/DC	£172.60	—	—	—
PNOZs5	750105	PNOZS524VDC	£237.92	751105	PNOZS5C24VDC	£237.92
PNOZs5, universal voltage	750135	PNOZS5/48-240VAC/DC	£247.24	—	—	—
PNOZs6	750106	PNOZS624VDC	£275.24	751106	PNOZS6C24VDC	£275.24

To increase the number of safety outputs – use PNOZsigma expander modules, see next page

# PNOZsigma contact expander modules



## Technical specification

	PNOZs7	PNOZs7.1	PNOZs7.2	PNOZs8	PNOZs9	PNOZs10	PNOZs11	PNOZs22
Safety outputs	4 NO	3 NO	4 NO	2 NO	3 NO	4 NO	8 NO	2 x 3 NO
Safety outputs (timed)	—	—	—	—	◆	—	—	—
Time delay range	—	—	—	—	0-300 seconds	—	—	—
Auxiliary outputs	1 NC	—	1 NC	—	1 NC	1 NC	1 NC	2 NC
Semi conductor outputs	1	1	1	1	—	—	—	—
<b>Compatible relays:</b>								
PNOZelog	◆	◆	◆	◆	◆	◆	◆	—
PNOZmulti	—	—	—	—	◆	—	—	—
PNOZsigma	◆	◆	◆	◆	—	◆	◆	—
PNOZmm0.1p	—	—	—	—	—	—	—	◆
PNOZmm0.2p	—	—	—	—	—	—	—	◆
PNOZ X	◆	◆	◆	◆	◆	◆	◆	—
Supply voltage	24V d.c.	24V d.c.	24V d.c.	24V d.c.	24V d.c.	24V d.c.	24V d.c.	24V d.c.
External fast fuse rating	6A	6A	6A	4A	6A	10A	10A	6A
Connections	Plug-in	Plug-in	Plug-in	Plug-in	Plug-in	Plug-in	Plug-in	Plug-in
Housing width (mm)	17.5	17.5	17.5	12.5	17.5	45	45	22.5
PFH <sub>0</sub>	2.31 x 10 <sup>-9</sup>	2.31 x 10 <sup>-9</sup>	2.31 x 10 <sup>-9</sup>	2 x 10 <sup>-7</sup>	2.34 x 10 <sup>-9</sup>	2.31 x 10 <sup>-9</sup>	2.31 x 10 <sup>-9</sup>	2.31 x 10 <sup>-9</sup>
Safety category*	Cat 4	Cat 4	Cat 4	Cat 2	Cat 4	Cat 4	Cat 4	Cat 4
Performance Level*	PLe	PLe	PLe	PLd	PLe	PLe	PLe	PLe
SIL claim*	SIL CL3	SIL CL3	SIL CL3	SIL CL2	SIL CL3	SIL CL3	SIL CL3	SIL CL3

\*The category that can be achieved depends on the category of the base unit. The contact expander module may not exceed this.

PNOZsigma contact expander modules are used to increase the number of contacts available on a base unit's instantaneous safety contacts.



Description	Screw Terminals			Spring-loaded Terminals		
	Ident No	Order Code	List Price	Ident No	Order Code	List Price
PNOZs7	750107	PNOZS724VDC	£107.30	751107	PNOZS7C24VDC	£107.30
PNOZs7.1	750167	PNOZS7124VDC	£102.61	751167	PNOZS71C24VDC	£102.63
PNOZs7.2	750177	PNOZS7224VDC	£112.83	751177	PNOZS72C24VDC	£112.83
PNOZs8	750108	PNOZS824VDC	£93.30	751108	PNOZS8C24VDC	£93.30
PNOZs9	750109	PNOZS924VDC	£144.62	751109	PNOZS9C24VDC	£144.62
PNOZs10	750110	PNOZS1024VDC	£177.27	751110	PNOZS10C24VDC	£177.27
PNOZs11	750111	PNOZS1124VDC	£177.27	751111	PNOZS11C24VDC	£177.27
PNOZs22	750132	PNOZS2224VDC	£172.93	751132	PNOZS22C24VDC	£172.93

## PNOZs30 – Safe speed monitor



### Features

- Provides safe monitoring of standstill, rotational speed, position, speed range, direction of rotation, and broken shearpin
- Feedback from incremental encoder (to RJ45)
- Feedback from proximity sensors (terminals)
- Advance warning of shutdown when threshold is reached
- Productivity is increased by avoiding unnecessary complete shutdown of processes
- Parameters are quickly entered by push & turn rotary knob, and stored on chipcard
- Expansion interface for 2 more expansion units
- Displays current frequency, current position, warning & error messages

### Technical specification

Supply voltage	24V-240V a.c./d.c.
Inputs	1 channel
Safe outputs	2 NO
Auxiliary outputs	2 NC
External fast fuse rating	.6A
Connections	Plug in (either spring-loaded or screw terminal)
Housing width	45mm

#### 1 input monitoring

PPH <sub>b</sub>	3.28 x 10 <sup>-8</sup>
EN 954-1 Category	Cat 2
EN ISO 13849-1 Performance Level	PLd
EN 62061 SIL Claim	SIL CL 2

#### 2 input monitoring

PPH <sub>b</sub>	1.50 x 10 <sup>-8</sup>
EN 954-1 Category	Cat 3
EN ISO 13849-1 Performance Level	PLe
EN 62061 SIL Claim	SIL CL 3

Description	Ident No	Order Code	List Price
PNOZs30 with screw terminals	750330	PNOZS3024VDC	£689.78
PNOZs30C with spring loaded terminals	751330	PNOZS30C24VDC	£689.78

## PSWZX1P – Standstill detection safety relay



### Features

- Monitors back EMF from single or three phase motors
- No external inputs other than connection to the motor windings are required
- Single or dual channel monitoring
- 2 safety outputs are enabled when the back EMF falls below the threshold level
- Detects open circuits

### Technical specification

Supply voltage	24V-240V a.c./d.c.
Inputs	L1, L2, L3 from monitored motor
Sensitivity adjustment	Via front dial
Safety contacts	2 NO, 4A
Auxiliary contacts	1 NC 2 x semiconductor
LED indication	Power, output, fault & channels
Connection	Screw or spring loaded

EN 954-1 Category	Cat 4
EN ISO 13849-1 Performance Level	PLe
EN 62061 SIL Claim	SIL CL 3

The device uses two separate measuring channels to measure the regenerated voltage, induced from the motor during the rundown period or during start-up.

If the voltage falls below the set response value (standstill threshold), the standstill monitor enables the monitored plant. If the voltage exceeds the set release value, the standstill monitor disables the monitored plant. To reactivate, the voltage at both channels must fall below the response value  $U_{on}$  within the time  $t_{g}$ .

Description	Ident No	Order Code	List Price
PSWZX1PC, 0.5V with spring loaded terminals	787949	PSWZX1PC05V	£376.14
PSWZX1P, 0.5V with screw terminals	777949	PSWZX1P05V	£378.58
PSWZX1PC, 3V with spring loaded terminals	787950	PSWZX1PC3V	£376.14
PSWZX1P, 3V with screw terminals	777950	PSWZX1P3V	£378.58

## Universal safety relays



Universal safety relays that can be used in a wide range of applications. They are ideal for holding as spares and can be used with any type of safety device with either manual or automatic reset.

### Features

- For use with emergency stops, position switches, solenoid interlocks, magnetic safety switches and light curtains
- Instantaneous safety contacts (STOP 0)
- 1 signalling output (SRB301-ST-V.2)
- LED status indication
- 1 or 2 channel monitoring
- Short circuit protected
- EDM external device monitoring

### Technical specification

Supply voltage . . . . . 24V d.c./a.c.  
 Outputs . . . 3 safety contacts 250V a.c. 8A  
 1 auxiliary contact 24V d.c. 2A  
 Signalling output . . . . . 1, 24V d.c. 100mA  
 (SRB301-ST-V.2)  
 Connection type . . . . . Screw terminal  
 Mounting . . . . . DIN rail  
 Dimensions  
 SRB301-MA . . . . . h100 x w22.5 x d121mm  
 SRB301-MC . . . . . h100 x w22.5 x d121mm  
 SRB301-ST-V.2 . . . . . h120 x w22.5 x d121mm

EN 954-1 Category	Cat 4
EN ISO 13849-1 Performance Level	PLe
EN 62061 SIL Claim	SIL CL 3
Mission Time	20 years

Description	Order Code	List Price
Safety relay with manual trailing edge reset	SRB301-MA-24VAC/DC	£153.35
Safety relay with automatic reset	SRB301-MC-24VAC/DC	£171.54
Safety relay with either manual trailing edge or automatic reset	SRB301-ST-V.2-24VAC/DC	£255.48

## Safety relays with time delay outputs



This range of safety relays have the addition of either one or two time delay contacts which are adjustable from 1 to 30 seconds. The relays are used for applications where a stop request is initiated to allow a run down of a rotating hazard before a second stop request halts the machine.

### Features

- For use with emergency stops, solenoid interlocks, safety switches and light curtains
- 1 or 2 channel control
- Instantaneous safety contacts (STOP 0)
- Time delay safety contacts (STOP 1)
- 1 transistor signalling output
- LED status indication
- Plug-in screw terminals
- EDM external device monitoring
- Monitored inputs
  - 2 NC contacts
  - Wire breakage detection
  - Earth connection detection

### Technical specification

Supply voltage . . . . . 24V d.c./a.c.  
 Outputs  
 SRB211ST . . . 2 safety contacts 250V a.c. 8A  
 1 auxiliary contact 250V a.c. 6A  
 SRB324ST . . . 3 safety contacts 250V a.c. 8A  
 2 auxiliary contacts 250V a.c. 6A  
 Signal output . . . . . 1 24V d.c. 100mA  
 Connection type . . . . . Screw terminal  
 Mounting . . . . . DIN rail  
 Dimensions  
 SRB211ST . . . . . h100 x w22.5 x d121mm  
 SRB324ST . . . . . h100 x w45 x d121mm  
 PFH value  
 STOP 0 . . . . .  $\leq 2.00 \times 10^{-9}/h$   
 STOP 1 . . . . .  $\leq 2.00 \times 10^{-7}/h$

### STOP 0

EN 954-1 Category	Cat 4
EN ISO 13849-1 Performance Level	PLe
EN 62061 SIL Claim	SIL CL 3
Mission Time	20 years

### STOP 1

EN 954-1 Category	Cat 3
EN ISO 13849-1 Performance Level	PLd
EN 62061 SIL Claim	SIL CL 2
Mission Time	20 years

Description	Order Code	List Price
Safety relay with 1 time delay output	SRB-211ST-V.2-24VAC/DC	£351.55
Safety relay with 2 time delay outputs	SRB-324-ST-V.2-24VAC/DC	£359.75

## Two hand control relay



Designed to be used with two hand control stations.

Inputs for each channel must be a NO/NC and the monitor ensures they are made within the required time scale. If the sequence is not correct, start up will be prevented.

### Features

- Monitoring two-hand control panels to EN 574 III C
- Instantaneous safety contacts (STOP 0)
- 1 auxiliary NC contact with antivalent functioning principle (auxiliary contacts are not to be used in safety circuits)
- Feedback circuit
- Electronic protection
- LED status indication
- Plug-in screw terminals
- EDM external device monitoring

### Technical specification

Supply voltage . . . . . 24V d.c.  
 Monitored inputs  
 2 NC/2NO contacts  
 Short circuit recognition  
 Wire breakage detection  
 Earth connection detection  
 Outputs . . . 2 safety contacts 250V a.c. 6A  
 1 auxiliary contact 24V d.c. 2A  
 Connection type . . . . . Screw terminal  
 Mounting . . . . . DIN rail  
 Dimensions . . . h100 x w22.5 x d121mm  
 PFH value . . . . .  $\leq 2.00 \times 10^{-6}/h$

EN 954-1 Category	Cat 4
EN ISO 13849-1 Performance Level	PLe
EN 62061 SIL Claim	SIL CL 3
Mission Time	20 years

Description	Order Code	List Price
Two hand control relay	SRB201-ZH-24VDC	£249.62

## Safety relay for 1 NO/1 NC safety switches



SRB301AN is an antivalent safety relay for monitoring 1 NO/1 NC input devices such as BNS magnetic switches. It ensures the switch has changed state and can also prevent single channel faults in some applications. The relay monitors a change of contact status from NC to NO in one channel and vice versa in the second channel.

### Features

- Monitoring of range magnetic safety sensors
- Instantaneous safety contacts (STOP 0)
- 1 signalling output
- Short circuit recognition
- Additional contacts using an input expander module (see page 489)
- LED status indication
- EDM external device monitoring

### Technical specification

Supply voltage . . . . . 24V d.c./a.c.  
 Monitored inputs . . . . . 1 NC/1NO contacts, short circuit, wire breakage and earth connection  
 Outputs . . . 3 safety contacts 250V a.c. 6A  
 1 auxiliary contact 24V d.c. 2A  
 Connection type . . . . . Screw terminal  
 Mounting . . . . . DIN rail  
 Dimensions . . . h100 x w22.5 x d121mm  
 PFH value . . . . .  $\leq 2.00 \times 10^{-6}/h$

EN 954-1 Category	Cat 4
EN ISO 13849-1 Performance Level	PLe
EN 62061 SIL Claim	SIL CL 3
Mission Time	20 years

Description	Order Code	List Price
Safety relay	SRB301-AN-V,2-24VAC/DC	£253.63

## Safety relay with double reset



SRB I00DR is a special time relay with a double reset used for the safe passage of machine operators in robot cells where it can be possible to restart a machine without the person in the cell being spotted.

By using a pushbutton in the cell the operator must make sure the cell is clear before a restart is made. Once the first pushbutton is activated, the operator must activate the second reset button within a set time, to ensure a start is made. If the time frame is exceeded the sequence must start again.

### Features

- For signal processing of potential free outputs, e.g. command devices
- 2 channel control
- 1 safety contact, STOP 0
- Time adjustable from 3s to 30s
- Signal processing with trailing edge
- 4 LEDs to show operating conditions

### Technical specification

Supply voltage . . . . . 24V d.c./a.c.  
 Monitored inputs . . . . . 2 NC contacts, short circuit, wire breakage and earth connection  
 Output . . . . . 1 safety contact 250V a.c. 6A  
 Connection type . . . . . Screw terminal  
 Mounting . . . . . DIN rail  
 Dimensions . . . . . h100 x w22.5 x d121mm

EN 954-1 Category	Cat 4
EN ISO 13849-1 Performance Level	PLe
EN 62061 SIL Claim	SIL CL 3
Mission Time	20 years

Description	Order Code	List Price
Safety relay with double reset	SRB I00DR-24VAC/DC	£168.13

## Safety monitoring relays



the right module for its particular application. Functions such as start/reset monitoring or cross circuit monitoring, for example, can be set via a rotary switch.

### Features

- Up to 11 different applications
- Monitoring of all conventional switchgear
- Simple adjustment of function with rotary switch wheel
- Quick response time (< 10ms)
- Single or dual channel evaluation
- Start/reset functions with monitoring
- Input expanders for 4 sensors up to PLe
- 2 hand control monitoring (according to type IIIC)
- Stop category 0 & I
- Up to 5 safety outputs
- Semi-conductor outputs up to 5.5A
- 22.5mm housing

### Technical specification

Supply voltage . . . . . 24V d.c./a.c.  
 Monitored inputs . . . . . 2 NC contacts, short circuit, wire breakage and earth connection  
 Output . . . . . Up to 3 safety contacts 230V a.c., 6A  
 Connection type . . . . . Screw terminal  
 Mounting . . . . . DIN rail  
 Dimensions . . . . . h98 x w22.5 x d115mm

EN 954-1 Category	Cat 4
EN ISO 13849-1 Performance Level	PLe
EN 62061 SIL Claim	SIL CL 3
Mission Time	20 years

An advantage of this range is that, with each basic version, several dozen existing safety relay modules can be replaced thanks to its multi-functionality.

Each module can be configured for up to eleven different applications via a simple control element. All conventional safety sensors and electromechanical safety equipment can be monitored.

The drastically reduced number of versions and a clear overview of the eight versions with their relevant functions makes it considerably easier for the machine manufacturer to select

Description	Order Code	List Price
Safety relay with 2 safety outputs, 5.5A/1 signalling output	SRB-E-201ST	£234.05
Safety relay with 2 safety outputs, 2A/1 signalling output	SRB-E-201LC	£135.93
Safety relay with 3 safety contacts/1 auxiliary contact	SRB-E-301ST	£210.41
Safety relay with 2 safety outputs/2 signalling outputs	SRB-E-204ST	£234.05
Safety relay with 2 safety outputs/4 signalling outputs	SRB-E-204PE	£125.29



## Protect PE – Input expander modules



Protect PE expander modules allow up to 4 additional inputs to be connected to a safety relay.

The input units are suitable for either 2 NC inputs or 1 NC/1 NO input types. All units have a non safety output to allow the status of the input to be fed back to a PLC or other control system. Each individual input is monitored for short circuits & open circuit detection.

### Features

- Connect up to 4 switches per interface, e.g. BNS safety magnetic switches, emergency stop control devices, interlocking devices and AOPDs
- Connection of switches with 2 NC contacts (PROTECT-PE-02) or of switches with NC/NO contacts (PROTECT-PE-11)
- Crosswire monitoring of the input circuits (only PROTECT-PE-02)
- Signalling output for each switch
- Cascading possible for the connection of up to 80 switches
- 6 LED to show operating conditions



### Technical specification

Supply voltage ..... 24V d.c.  
 Monitored inputs ..... 4 x 2 channel  
 see order code for configuration  
 short circuit, wire breakage and earth connection  
 Outputs ... 2 auxiliary contact 24V d.c. 2A  
 7 signalling outputs 24V d.c. 100mA  
 Connection type ..... Screw terminal  
 Mounting ..... DIN rail  
 Dimensions ..... h126 x w48 x d43mm

EN 954-1 Category	Cat 3
EN ISO 13849-1 Performance Level	PLd
EN 62061 SIL Claim	SIL CL 2
Mission Time	20 years

Description	Order Code	List Price
4 x 2 channel inputs, 2 NC or OSSD input devices	PROTECT-PE-02-SK	£103.86
4 x 2 channel inputs, 1 NO/1 NC input devices such as magnetic switches	PROTECT-PE-11-SK	£79.50

## Safety relays



**OSSD1** – For devices with OSSD outputs and integrated reset/EDM functions (e.g. safety relays, safety laser scanners).

**OSSD2** – For devices with OSSD outputs but without reset/EDM functions (e.g. basic safety light curtains, RFID safety switches).

**EMSS1** – For dual channel equivalent electromechanical switches (e.g. safety limit switches, interlocks, emergency stops).

**HAND1** – For two hand modules as per EN574.

### Selection chart



	RLY3-OSSD1	RLY3-OSSD2	RLY3-EMSS1	RLY3-HAND1
Discrepancy monitoring	—	✓	✓	✓
Sequence monitoring	✓	✓	✓	✓
Cross circuit detection	—	—	✓	—
Reset	—	Automatic/manual	Automatic/manual	—
No. of N/C contacts	1	—	—	—
Voltage supply	—	PELV or SELV	PELV or SELV	PELV or SELV
Power consumption	≤1.5W	≤1.3W	≤1.3W	≤1.3W

### Features

- Two contact paths for switching off the machine
- Fast response time
- Plug-in terminals for easy maintenance
- Slim housing to save space in cabinet
- Diagnostics via LED's and application diagnostics output
- Clear and concise relay selection
- Simple mounting concept

### Technical specifications

Connection type ..... Plug-in terminal  
 Overvoltage category ..... III  
 Rated impulse withstand voltage ... 6kV  
 Impulse voltage ..... 24V d.c.  
 Response time ..... 10ms  
 Switching voltage ..... 10-250V  
 Switching current ..... 10mA to 6A  
 Mirror contact voltage ..... 15-30V d.c.  
 Mirror contact current ..... 3-100mA  
 Ambient temperature ... -25° to +55°C  
 Storage temperature ... -25° to +70°C  
 Width ..... 18mm  
 Protection rating ..... IP20

PFF <sub>h</sub>	1.0 x 10 <sup>-9</sup>
PFD <sub>avg</sub>	5.0 x 10 <sup>-5</sup>
EN ISO 13849-1 Category	Cat 4
EN ISO 13849-1 Performance Level	PLe
EN 62061 SIL Claim	SIL CL 3
Mission Time	20 years

Description	Order Code	List Price
OSSD1 safety relay	RLY3-OSSD1	£121.55
OSSD2 safety relay	RLY3-OSSD2	£168.30
EMSS1 safety relay	RLY3-EMSS1	£168.30
HAND1 safety relay	RLY3-HAND1	£168.30

# 3SKI – Safety relays



Device connector

The 3SKI safety relays are compact units only 22.5mm wide. They offer single or 2 channel inputs with 3 NO safety relay contacts and 1 NC signalling contact. An optional connection module allows the relay to be connected directly to the 3RM1 direct on line starters, this reduces wiring time and saves panel space.

### Features

- 1 or 2 channel control
- Supports switch contact or sensor inputs
- Compact 22.5mm design
- Device connector reduces wiring time
- Detachable screw connection

### Technical specifications

Input circuit . . . . . 1 or 2 channel  
 Control voltage . . . . . 24V d.c.  
 Reset . . . . . Monitored start/auto start  
 Connection type . . . . . Screw terminals  
 Ambient temperature . . . . . -25 to +60°C  
 Protection . . . . . IP20  
 Mounting . . . . . DIN rail  
 Dimensions . . . . . h100 x w22.5 x d122mm  
**3SK1121-1AB40**  
 Safety outputs . . . . . 3 NO relay contacts  
 . . . . . 5A @ 230V a.c.  
 Signalling contacts . . . . . 1 NC relay contact  
 . . . . . 1.5A @ 230V a.c.

### 3SK1121-1CB41

Safety related instantaneous contacts . . . . . 2  
 Safety related delayed switching . . . . . 2

EN ISO 13849-1 Performance Level	PLe
IEC 61508	SIL 3

Output Type	Adjustable off-delay time	Rated Control Supply Voltage	Enable Circuits	Signalling Circuits	Order Code	List Price
Relay	—	24V d.c.	3	1	3SK1121-1AB40	£128.28
Relay	0.05 to 3s	24V d.c.	2/2 time delay	—	3SK1121-1CB41	£160.35

### Accessories

Description	Order Code	List Price
Device connector, 22.5mm	3ZY1212-2EA00	£9.36

## 3RM1 Failsafe direct and reversing motor starters



The 3RM1 failsafe motor starters are just 22.5mm wide and combine the functionality of contactor overload relay and safety related shutdown up to PLe or SIL3.

Hybrid switching provides relay and semi-conductor technology in a single package. The 3RM1 offers easy adjustment of motor current with minimal wiring and troubleshooting. These units can be linked to the 3SKI safety relays to provide additional safety functionality (see above).

### Features

- Failsafe direct or reversing starters
- Built-in overload protection
- Narrow width, only 22.5mm
- Reduced control wiring
- 24V d.c or 110/230V a.c. control circuits
- Built in auxiliary contact
- With ATEX certification and safety-related shutdown

For full details see page 104

# Flexi Soft safety control system



The Flexi Soft safety controller offers a whole range of main modules, expansion modules, motion control modules and gateways that can be used to create a customised, efficient solution for your safety application.

**Flexi Soft Designer software** **SICK**  
 offers intuitive programming, rapid commissioning and continuous monitoring.  
**FREE to download from www.sick.com**

### Features

- RS232 connection for configuration and real-time diagnostics
- System plug stores the configuration of the safety controller
- Up to 12 input or input/output expansion modules can be connected in one system
- Expandable with up to two gateways per system rack
- Safety networking up to 32 stations
- Safe communication without additional hardware reduces costs and saves time
- Reduction of wiring opposed to standard safety relays
- Software has a simulation package for pre-testing safety
- Reports generate bill of materials, logic and wiring diagrams

EN ISO 13849-1 Performance Level	PLe
EN 62061 SIL Claim	SIL CL 3

## System configuration and CPU selection

### 1 Safety related controller

#### STANDALONE (FX3-CPU0 or greater)

A standalone Flexi Soft station allows the user to control the machine via one safety related controller. The safety related controller will allow up to 96 safe inputs with up to 48 semiconductor outputs rated at 24V d.c. 1A per channel.

The standalone system will allow for machine mounted I/O which is cascaded into one safety function via Flexi Loop which allows for 32 devices per loop and eight loops per system.

### Up to 4 Flexi Soft stations

#### FLEXI LINK (FX3-CPU1 or greater)

Flexi Link allows you to combine up to four Flexi Soft stations via EFI for safe data communication. Only FX3-CPU1 main modules can be used in a Flexi Link system, the connection of FX3-CPU0 modules are not possible.

#### Features

- Safe connection of up to four Flexi Soft stations via EFI
- Teaching simulates the presence of temporarily suspended (switched off) stations
- Any station can be used to address and configure the entire system

### Up to 32 Flexi Soft stations

#### FLEXI LINE (FX3-CPU3)

Flexi Line offers the flexibility demanded by modern machine concepts. By networking up to 32 Flexi Soft stations, it is possible to map modular machine structures in a consistent and efficient way – even at a distance of up to 1,000m between two Flexi Soft stations.

Configuration is quick and easy: The process image, with a data width of up to 96 bit, needs to be defined only once for the entire system. This division makes communication more efficient and shortens response times.

# Flexi Soft safety control system

## STEP 1 – Select hardware and memory plug

	FX3-CPU0	FX3-CPU1	FX3-CPU2	FX3-CPU3
System plug	Screw-type terminals			
EFI connection	Spring terminals			
Flexi Line connection	—			Spring terminals
No. of EFI interfaces	0	2		
Configuration & diagnostics interface	RS-232			RS-232, USB

### Technical specification

Supply voltage . . . . . 24V d.c.  
 Internal power consumption . . . . . ≥2.5W  
 Switch-on time . . . . . ≤18s  
 Operating temperature . . . . . -25 to +55°C  
 Dimensions . . . . . h96.5 x w22.5 x d120.6mm

EN ISO 13849-1 Performance Level	PL e
EN 62061 SIL Claim	SIL CL 3

## CPU's

No. of EFI Interfaces	Flexi Link	Flexi Line	Type	Order Code	List Price	Memory Plugs		
						Automatic Configuration Recovery (ACR)	Order Code	List Price
0	—	—	FX3-CPU000000	1043783	£157.84	—	1043700	£26.27
2	●	—	FX3-CPU130002	1043784	£229.89	—	1043700	£26.27
2	●	—	FX3-CPU230002	1058999	£264.65	●	1047162	£32.83
2	●	●	FX3-CPU320002	1059305	£300.32	●	1047162	£32.83

## STEP 2 – Select network gateway (if required)

The Flexi Soft safety related controller allows for non-safe optional networking for communication between PLCs and the safety controller for system diagnostics. Up to two network cards can be selected per system.

Fieldbus/Industrial Network	Order Code	List Price
Ethernet/IP	1044072	£327.89
Modbus TCP	1044073	£327.89
ProfiNet	1044074	£327.89
EtherCAT	1051432	£327.89
ProfiBus DP	1044075	£327.89
CANopen	1044076	£324.45
DeviceNet	1044077	£324.45
CC Link	7101043	£324.45

## STEP 3 – Select your I/O requirements

Select up to 96 digital inputs and 48 outputs:

Flexi Loop Compatible	No. of Safe Inputs	No. of Non-Safe Inputs	No. of Test Signal Outputs	No. of Safe Outputs	No. of Non-Safe Outputs	Order Code	List Price
●	8	—	2	4	0	1044125	£251.23
●	8	—	8	0	0	1044124	£173.90
●	8	—	2	0	4-6	1061777	£203.21
—	—	6-8	0	0	6-8	1061778	£178.40

## STEP 4 – Do you require relay outputs?

Relay output cards can be used for volt free outputs, a semi-conductor from the XTIO card is used to power this output card which is manually wired. Cards with four enabling contacts require two XTIO outputs.

### Relay output cards

No. of Enable Current Contacts	No. of Signalling Current Contacts	No. of Contactor Monitoring Contacts	Order Code	List Price
2	1	1	6032677	£145.43
4	2	2	6032676	£202.30
2	0	1	1043916	£75.27
2	0	1	1043918	£90.70

# Flexi Soft safety control system

## STEP 5 – Does the system require speed monitors?

### Optional speed monitoring via encoder



Flexi Soft drive monitor

The Flexi Soft drive monitor is the ideal expansion module for the Flexi Soft safety controller for use in drive monitoring. Monitoring can be performed using functions such as speed and direction monitoring and the execution of stop functions in accordance with IEC 61800-5-2. All commonly used encoder interfaces are supported.

#### Technical specification

- Output voltage for encoder . . . . . 24V d.c.
- Encoder type . . . . . Incremental A + B
- Connection type . . . . . 15 pin D-Sub
- Drive safety functions . . . . .
  - Safe stop I (SS1), 2 (SS2)
  - Safe operating stop (SOS)
  - Safe speed monitoring (SSM)
  - Safe limited speed (SLS)
  - Safe direction of motion (SDI)
  - Safe brake control (SBC)

EN ISO 13849-1 Performance Level	PLe
EN 62061 SIL Claim	SIL CL 3
IEC 61508	SIL 3

Description	Order Code	List Price
Flexi Soft drive monitor	1062344	£357.21



Motor feedback splitter box



Dual encoder connection box

### Connection modules

#### Motor feedback splitter box

Used to connect one encoder (normally used in conjunction with a motor feedback encoder)

Connection to Flexi Soft drive monitor:

- Female connector, D-Sub HD, 15-pin

Connection to a second motor feedback splitter box:

- Female connector, D-Sub, 9-pin

#### Dual encoder connection box

Used to connect two encoders

Connection to Flexi Soft drive monitor:

- Female connector, D-Sub HD, 15-pin

Description	Order Code	List Price
Motor feedback splitter box	2068728	£90.53
Dual encoder connection box	2068729	£84.51

### Connecting cables

Connection Type Head A	Connection Type Head B	Cable Length	Usage	Order Code	List Price
Female, micro D-Sub, 15 pin, straight	Open conductor heads	2m	For direct encoder connection	2067893	£48.76
Male, D-Sub HD, 15 pin, straight	Female, micro D-Sub, 15 pin, straight	2m	To connect Flexi Soft drive monitor with motor feedback splitter box or dual encoder connection box	2067798	£64.54
Male, D-Sub HD, 15 pin, straight	Female, micro D-Sub, 15 pin, straight	10m		2067799	£78.00
Male, D-Sub HD, 15 pin, straight	Male, D-Sub, 9 pin, straight	2m	To connect two motor feedback splitter boxes with each other	2067800	£51.54
Male, D-Sub HD, 15 pin, straight	Male, D-Sub, 9 pin, straight	10m		2067801	£64.54

# Flexi Loop – Distributed machine I/O



Flexi Loop allows you to cascade up to 32 safety devices for distributed machine I/O. Guard switches, E-stops, Light curtains and other devices can all be cascaded into one safety function, whilst providing diagnostics for each individual switch/device on the machine and in the software. Integrated switching signals allow for the use of interlocks, switches and lamps. All sensors are supplied with power directly from the Flexi Loop.

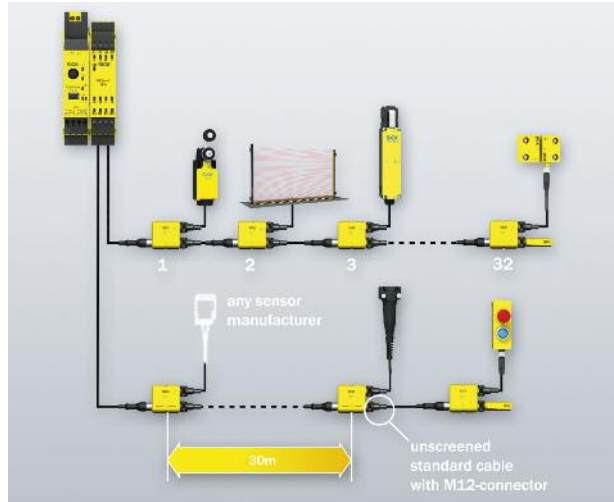
Unscreened standard cables are used with M12 plugs. In total Flexi Loop guarantees the highest level of security. Cascading sensors reduces the amount of wiring and the number of safety inputs in the control cabinet. It also provides a comprehensive diagnostic check of all doors, emergency stop pushbuttons and sensors. In conjunction with the Flexi Soft and the Flexi Classic, the entire safety application is able to cost effectively meet customer needs.

The system uses a 5 core MR cable for connection of nodes which supply 24V, 0V, 1 x PLST channel, 1 x safety channel, 1 x diagnostic channel – the nodes then allow for connection of 5 or 8-pin devices dependant on node selection.

The loop is then terminated using the end terminator to close the loop.

## Features

- Ability to cascade 32 sensors with up to 30m per segment in compliance with performance level PLE
- Compatible with sensors from all manufacturers
- Transfer of detailed diagnostic information
- Integrated standard inputs and outputs
- Power supply for sensors is included
- Connection of the sensors via unscreened standard cable with M12 plugs
- IP65 and IP67 enclosure rating



## For safety sensors with dual-channel OSSD outputs

Connection Type	No. of Non-Safe Inputs	No. of Non-Safe Outputs	Order Code	List Price
M12, 5 pin female connector	1	0	1061709	£58.54
M12, 8 pin female connector	1	1	1061710	£63.40

## For dual-channel equivalent electro-mechanical safety switches

Connection Type	No. of Non-Safe Inputs	No. of Non-Safe Outputs	Order Code	List Price
M12, 5 pin female connector	0	0	1061711	£55.63
M12, 8 pin female connector	1	1	1061712	£65.33

## Power supply module

Description	Order Code	List Price
Power supply module used to connect a power supply with 24V d.c. for the electrical isolation and for overcurrent shutdown	1061715	£61.45

## Flexi Loop terminator module

Description	Order Code	List Price
Terminator module used to terminate the safe sensor cascade on the last Flexi Loop node	1061716	£24.78

See next page for Flexi Loop accessories

## Flexi Loop accessories

SICK



## Mounting brackets

Description	Order Code	List Price
Flexi Loop fixing clip – C-Fix bracket	2068830	£7.62

## Plug connectors and cables

Connecting cable (female connector - open)

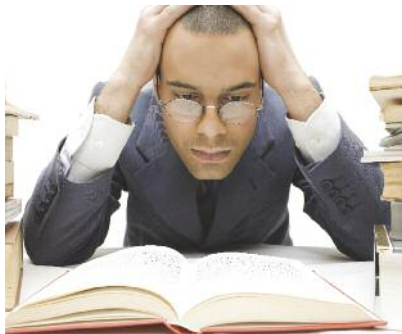
Connection Type Head A	Connection Type Head B	Cable Length	Order Code	List Price
M12, 5 pin female connector, straight	Open conductor	5m	2095618	£14.77
M12, 5 pin female connector, straight	Open conductor	10m	2095619	£24.12

Connecting cable (male connector - open)

Connection Type Head A	Connection Type Head B	Cable Length	Order Code	List Price
M12, 5 pin male connector, straight	Open conductor	5m	2095842	£14.12
M12, 5 pin male connector, straight	Open conductor	10m	2095843	£23.28
M12, 8 pin male connector, straight	Open conductor	5m	2095869	£22.16
M12, 8 pin male connector, straight	Open conductor	10m	2095870	£33.85

Connecting cable (male - female connector)

Connection Type Head A	Connection Type Head B	Cable Length	Order Code	List Price
M12, 4 pin male connector, straight	M12, 4 pin female connector, straight	1m	2096007	£11.50
M12, 4 pin male connector, straight	M12, 4 pin female connector, straight	1.5m	2096008	£12.34
M12, 5 pin male connector, straight	M12, 5 pin female connector, straight	5m	2096010	£20.38
M12, 5 pin male connector, straight	M12, 5 pin female connector, straight	10m	2096011	£28.05
M12, 8 pin male connector, straight	M12, 8 pin female connector, straight	5m	2096034	£34.88
M12, 8 pin male connector, straight	M12, 8 pin female connector, straight	10m	2096035	£46.47

Flexi Soft Designer software is available to download free of charge from [www.sick.com](http://www.sick.com)

## Do you need Technical Support?

We can help with that ...

Call and speak to one of our technical support engineers for free expert technical advice

**Blackburn - 01254 685900**

# ES1 I – Emergency stop pushbuttons



	ES11-SA1A4	ES11-SA2B8	ES11-SC4D8
<b>Performance</b>			
Emergency stop button (illuminable)	—	✓	—
Reset button (illuminable)	—	—	✓
<b>Interfaces</b>			
Connection type	M12, 4 pin plug connector	M12, 8 pin plug connector	M12, 8 pin plug connector
No. of positive action N/C contacts	2	2	2
No. of N/O contacts	0	0	1
Usage category	DC13 (EN 60947-5-1)	—	—
Rated operating current (voltage)	2A (24V d.c.)	—	—
Switching voltage	—	1 to 30V d.c.	1 to 30V d.c.
Operating current	—	1 to 100mA	1 to 100mA
Switching power	—	≤250mW	≤250mW
<b>Electrical life</b>			
Emergency stop button	5 x 10 <sup>4</sup> switching cycles	5 x 10 <sup>4</sup> switching cycles	5 x 10 <sup>4</sup> switching cycles
Reset button	—	—	1 x 10 <sup>5</sup> switching cycles
Contact material	AgNi	AgNi, 5µm gold plated	AgNi, 5µm gold plated
<b>Illumination</b>			
Supply voltage Vs	—	30 V a.c./d.c.	30V a.c./d.c.
Operating current	—	4mA (24V d.c.)	14mA (24V d.c.)
<b>Mechanical data</b>			
Weight	112g	115g	121g
Mechanical life	—	—	—
Emergency stop button	5 x 10 <sup>4</sup> switching cycles	5 x 10 <sup>4</sup> switching cycles	5 x 10 <sup>4</sup> switching cycles
Reset button	—	—	1 x 10 <sup>5</sup> switching cycles



The ES1 I emergency stop pushbuttons can be integrated easily into the Flexi Loop safety sensor cascade via plug-and-play, including power supply.

### Features

- Slim plastic housing with quick disconnect mounting clip
- Available as an emergency stop pushbutton or as a combined emergency stop/reset unit
- Emergency stop pushbutton with optional LED illumination
- Illuminated reset pushbutton
- Flexi Loop-compatible M12 plug connector

### Technical specification

No. of positive action N/C contacts . . . . . 2  
 No. of N/O contacts . . . . . 0  
 Dimensions . . . . . w49 x h123 x d52mm  
 Flexi Loop compatible  
 plug connector . . . . . Yes  
 Protection class . . . . . III  
 Switching principle . . . . . Slow action  
 switching element  
 Housing material . . . . . PBT

B10d value **2 x 10<sup>5</sup> switching cycles**

Description	Order Code	List Price
ES11 emergency stop pushbutton	ES11-SA1A4	£64.82
ES11 illuminated emergency stop pushbutton	ES11-SA2B8	£88.47
ES11 emergency stop pushbutton with reset button	ES11-SC4D8	£101.55





# ER12 – Safety command devices



Before restarting the machine, the protective device must be reset. The reset pushbutton must be placed near the hazardous area so that personnel can ensure the area is clear prior to pushing the reset button.

### Features

- Slim plastic housing with quick disconnect mounting clip for easy installation
- Illuminated reset pushbutton
- Quick commissioning and easy replacement with a 4 pin M12 plug connector
- User friendly status indication

The ER12 reset pushbuttons are used when the protective device initiates a stop function. In some cases, people might be in the hazardous area without being detected by the protective device.

### Technical specification

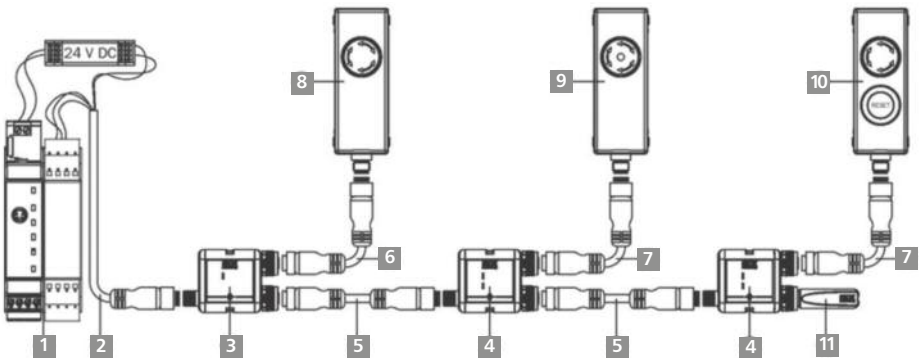
No. of NO contacts	1
Reset button (illuminable)	Yes
Connection type	M12, 4 pin plug connector
Protection class	III
Switching principle	Slow action switching element
Rated operating current (voltage)	2A (24V d.c.)
Electrical life	1 x 10 <sup>6</sup> switching cycles
Contact material	AgNi
Supply voltage Vs	30V a.c./d.c.
Operating current	14mA (24V d.c.)
Dimensions	w40 x h123 x d36mm

Rated value 1 x 10<sup>6</sup> switching cycles

Description	Order Code	List Price
ER12 safety command device	ER12-SB3C4	£62.43
ER12 safety command device for muting applications	ER12-SB3C4S01	£60.73

## Flexi Loop emergency stop device example

Series connection of three ESII emergency stop pushbuttons on a Flexi Loop safe sensor cascade



- |   |   |
|---|---|
| <p><b>1</b> Flexi Soft safety controller</p> <p><b>2</b> Connecting cable with female connector M12, 4 pin and open conductor heads</p> <p><b>3</b> Flexi Loop node – FLN-EMSS0000105</p> <p><b>4</b> Flexi Loop node – FLN-EMSS1100108</p> <p><b>5</b> Connecting cable with female &amp; male M12, 5 pin connectors</p> <p><b>6</b> Connecting cable with female &amp; male M12, 4 pin connectors</p> | <p><b>7</b> Connecting cable with female &amp; male M12, 8 pin connectors</p> <p><b>8</b> Emergency stop pushbutton – ESII-SAIA4</p> <p><b>9</b> Emergency stop pushbutton – ESII-SA2B8</p> <p><b>10</b> Emergency stop pushbutton – ESII-SC4D8</p> <p><b>11</b> Flexi Loop termination element – FLT-TERM00001</p> |
|---|---|

# PNOZmulti Mini

Simple overview; via 6 LEDs – no external measuring devices required



Rapid assembly via spring clips; no need for tools



Rapid installation; spring-loaded terminals, chambers operated individually (with optional screw terminals)



Simple diagnostics; integrated display for showing information and diagnostics



Simple configuration with the PNOZmulti Configurator via a standard USB interface



Values are easy to request thanks to a rotary knob with key function (push and turn)



Safe from manipulation; setting elements have a lockable cover and password protection



- Expandable units can connect up to four Safe link modules, one Ethernet TCP/IP module and one serial module - to the left, and PNOZSigma expander modules - to the right
- Safe link modules connect any combination of PNOZmulti and PNOZmulti Mini to create networked, distributed safe control
- Using safe link modules for PDP67 F 8DI ION decentralised input/outputs modules, a maximum of 64 dual channel remote outputs can be connected (using 4 Safe link modules)

## Features

- Configurable inputs and outputs using PNOZmulti Configurator software, via chip card or mini USB interface
- Compact design, only 45mm wide
- Integrated display and customisable text
- Save up to 40% time and cost in engineering phases
- Less wiring saves control panel space
- Non-expandable version is suitable for 3-6 safety functions
- Expandable safety functions is ideal for 4 or more safety functions or where distributed control is required

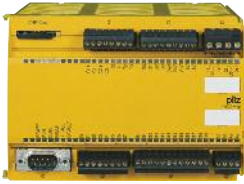
## Technical specification

Housing width	45mm
Supply voltage	24V d.c.
Safe outputs	4 solid state
Safe inputs	20 single channel (can also be configured as standard [non-safe] inputs)
Test pulses	4
Connections	Plug in

EN 954-1 Category	Cat 4
EN ISO 13849-1 Performance Level	PLe
EN 62061 SIL Claim	SIL CL 3

Description	Ident No	Order Code	List Price	Screw Terminals		Spring-loaded Terminals	
				Order Code	List Price	Order Code	List Price
Non-expandable multi Mini	772000	PNOZmm0p	£426.97	750008	£20.90	751008	£20.90
Expandable multi Mini	772001	PNOZmm0.1p	£453.54	750008	£20.90	751008	£20.90
Expandable multi Mini; built in Safe link	772002	PNOZmm0.2p	£547.54	750008	£20.90	751008	£20.90
Safe link module	772020	PNOZmm1p	£198.93	750004	£15.66	751004	£15.66
Safe link module for PDP67 F 8DI ION	772021	PNOZmm1z	£196.62	750004	£15.66	751004	£15.66
Ethernet module	772030	PNOZmmc1p	£165.77	750004	£15.66	751004	£15.66
Serial comms module	772031	PNOZmmc2p	£94.35	750004	£15.66	751004	£15.66

## PNOZmulti base units



The configurable control system PNOZmulti is multifunctional, freely configurable and tailored for use in many different areas of mechanical engineering.

As your plant expands, the modular PNOZmulti simply expands with it, adding up to eight expansion modules in any combination to suit your specific requirements:

- Input and output modules
- Fieldbus modules

- Safe speed and standstill monitors
- Safe link modules for safely connecting several base units
- Safe analogue modules for safely connecting decentralised periphery

### Flexible application with modular expandability

- Up to 90 I/Os (basic- plus expansion modules)
- Up to 8 incremental encoders
- Up to 8 safety analogue inputs
- Up to 4 PNOZmulti to PNOZmulti safety connections
- Up to 16 decentralised PDP67-modules
- 64 dual channel decentralised inputs
- 1 fieldbus-module

### Features

- Configurable inputs and outputs using PNOZmulti Configurator software, via chip card or mini USB interface
- Save up to 40% time and cost in engineering phases
- Less wiring saves control cabinet space

### Technical specification

Housing width	.....	135mm
Supply voltage	.....	24V d.c.
Safe outputs	.....	4 solid state + 2 relay (2 contacts)
Safe inputs	.....	20 single channel
Test pulses	.....	4
Connections	.....	Plug in

EN 954-1 Category	Cat 4
EN ISO 13849-1 Performance Level	PLe
EN 62061 SIL Claim	SIL CL 3

Screw Terminals		Spring-loaded Terminals	
Order Code	List Price	Order Code	List Price
793100	£17.28	783100	£17.28
793100	£17.28	783100	£17.28
793100	£17.28	783100	£17.28
793100	£17.28	783100	£17.28
793100	£17.28	783100	£17.28
—	—	—	—

Description	Ident No	Order Code	List Price
Non-expandable base unit	773110	PNOZm0p	£475.03
Expandable PNOZ Multi	773100	PNOZm1p	£719.73
Expandable base unit with Ethernet TCP/IP	773103	PNOZm1pETH	£997.26
Expandable base unit for press applications	773120	PNOZm2p	£854.08
Expandable base unit for burner management	773125	PNOZm3p	£988.72
Replacement bus terminator	—	779110	£6.92

## PNOZmulti Safe link modules



Where required, up to four PNOZmulti base units can be used to monitor and control more complex machinery. In this case, the Safe link module enables data to be exchanged between the PNOZmulti base units.

With the modular PNOZmulti, up to six PNOZ m1 p link modules can be connected to each base unit (in either ring or tree structure).

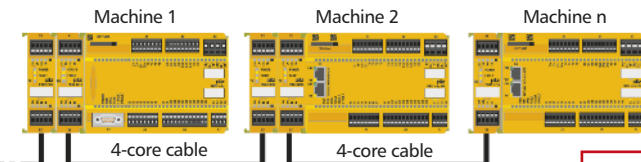
Using the PNOZmulti Configurator, you can quickly and easily allocate the

information to be transferred, without specialist knowledge of safe bus systems, or specifically addressing the devices.

### Technical specification

Connections ..... Plug in

EN 954-1 Category	Cat 4
EN ISO 13849-1 Performance Level	PLe
EN 62061 SIL Claim	SIL CL 3



Description	Ident No	Order Code	List Price	Screw Terminals		Spring-loaded Terminals	
				Order Code	List Price	Order Code	List Price
Safe link module	773540	PNOZm1p	£190.00	793400	£4.79	783400	£4.65

## PNOZmulti input expansion modules



### Features

#### PNOZ ma1p (analogue)

- Range monitoring (4 range limits can be configured)
- Threshold value monitoring (8 limit values can be configured)
- Input voltage range: -10.24 to +10.2375V
- Input current range: 0-25.59mA
- Installed to the left of the base unit
- A maximum of 4 PNOZ ma1p units can be connected to the base unit
- Status indicators

#### PNOZ mi1p / mi2p (digital)

- A maximum of 8 input modules can be connected to the base unit
- Connect to base unit using jumpers on the back of the unit

### Technical specification

Connections . . . . . Plug in

EN 954-1 Category	Cat 4
EN ISO 13849-1 Performance Level	PLe
EN 62061 SIL Claim	SIL CL 3

Description	Ident No	Order Code	List Price	Screw Terminals		Spring-loaded Terminals	
				Order Code	List Price	Order Code	List Price
2 safe analogue input module	773812	PNOZma1p	£381.94	793700	£5.77	783700	£5.77
8 safe digital input module	773400	PNOZmi1p	£152.59	793400	£4.79	783400	£4.65
8 standard digital input module	773410	PNOZmi2p	£126.67	793400	£4.79	783400	£4.65

## PNOZmulti output expansion modules



### Features

#### PNOZ mo1p

- 4 safe semiconductor outputs (2A, 24V d.c.)

#### PNOZmo2p:

- 2 N/O safe outputs (6A, 24V)

#### PNOZmo3p:

- 2 safe semiconductor outputs (2A, 24V d.c.)

#### PNOZmo4p:

- 4 N/O safe outputs (6A, 24V)

#### PNOZmc1p:

- 16 non-safety, auxiliary outputs

### Technical specification

Connections . . . . . Plug in

EN 954-1 Category	Cat 3
EN ISO 13849-1 Performance Level	PLd
EN 62061 SIL Claim	SIL CL 2

A maximum of 8 modules can be attached to an expandable PNOZmulti base unit (on the right).

You cannot connect more than 6 semiconductor safe output modules per base. All expansion modules connect to the base using jumpers on the back of the unit.

Description	Ident No	Order Code	List Price	Screw Terminals		Spring-loaded Terminals	
				Order Code	List Price	Order Code	List Price
4 safe semiconductor outputs	773500	PNOZmo1p	£205.36	793400	£4.79	783400	£4.65
2 N/O safe outputs	773520	PNOZmo2p	£163.14	793520	£2.42	783520	£2.42
2 safe semiconductor outputs	773510	PNOZmo3p	£218.80	793400	£4.79	783400	£4.65
4 N/O safe outputs	773536	PNOZmo4p	£177.53	793536	£4.79	783536	£4.79
16 standard (non-safety) auxiliary outputs	773700	PNOZmc1p	£259.30	793700	£5.77	783700	£5.77

# PNOZmulti safe speed and standstill monitor



The speed monitor can independently monitor two axes for standstill, speed and direction of rotation.

The speed monitor signals the status of the monitored values to the base unit. Depending on the safety circuit loaded, the values can be transferred from the base unit to a relay output on a safety system, for example. Incremental encoders or proximity switches can also be used to record the values.

### Technical specification

#### Inputs

- Proximity switch . . . . . N/O PNP, 24V d.c.
- Encoder . . . . . Incremental with differential output A + B supply 12-30V d.c.
- Input frequency . . . . . 0.1-3kHz proximity 0.2-200kHz encoder
- Output signals . . . . . Standstill over speed and fault
- Indication . . . . . Standstill over speed and fault

#### Connection

- Encoder . . . . . RJ45
- Power and proximity . . . . . Plug in

### Features

Monitoring of 2 independent axes

- Connection (per axis); 1 incremental encoder, or 2 proximity switches, or 1 incremental encoder and 1 proximity switch

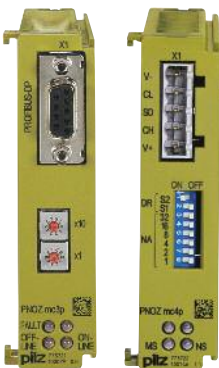
Measured variables:

- Standstill
- Speed (8 values can be set)
- Direction of rotation

EN 954-1 Category	Cat 3
EN ISO 13849-1 Performance Level	PLe
EN 62061 SIL Claim	SIL CL 3

Description	Ident No	Order Code	List Price	Screw Terminals		Spring-loaded Terminals	
				Order Code	List Price	Order Code	List Price
2 axis safe speed and standstill monitor	773815	PNOZms2pHTL	£519.40	793800	£2.88	783800	£3.52
RJ45 cable; 5m (for encoder)		773856	£17.62	-	-	-	-

# PNOZmulti fieldbus communication modules



Fieldbus communication modules can help to integrate the PNOZmulti into your machine or plant control network.

All these modules can be configured using the PNOZmulti Configurator. Please note; only one comms module can be connected per PNOZmulti base unit.

### PNOZmulti Configurator

Graphic tool for configuration and programming of the PNOZmulti.

See page 503 for further details

Description	Ident No	Order Code	List Price
EtherCAT2 module	773713	PNOZmc2.1p	£371.73
Profibus module	773732	PNOZmc3p	£352.90
DeviceNet module	773711	PNOZmc4p	£354.53
CANopen module	773712	PNOZmc6p	£371.73
CC-link module	773716	PNOZMC7P-CCLINK-2	£332.34
Ethernet IP/Modbus TCP module	773730	PNOZmc8p	£450.66
Profinet IO module	773731	PNOZmc9p	£450.66

Please note: PNOZMC7P-CCLINK-2 is a direct replacement for PNOZmc7p (773726)

# PNOZmulti 2 system

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The PNOZmulti 2 is the next generation of multifunctional, freely configurable safety relays based on the original PNOZmulti (now over 10 years old), but with a housing width of only 45mm. The base modules are available with or without native inputs.

## Flexible application due to modular expandability ...

### PNOZMBO

- Base module with 20 safe digital inputs
- Up to 8 inputs can be configured as auxiliary outputs, 4 safe semi-conductor outputs
- Can be expanded to the right by up to 6 modules
- 256 connection points in the program up to 32kB size stored on chipcard (purchased separately)
- Programmed via mini USB Port

### PNOZMB1

- Base module with 2 Ethernet interfaces - TCP/IP for programming and Modbus TCP for PLC or HMI connection)
- USB memory
- Can be expanded to the right by up to 12 modules
- 1024 connection points in the program up to 512MB size stored on the integrated USB stick (supplied with base module).

### PNOZMEF-MULTILINK

- Up to 4 PNOZmulti 2 base units can be linked to each other safely (sharing 32 virtual safety bits) using PNOZMEF-MULTILINK modules

## Features

- Configurable inputs and outputs using PNOZmulti Configurator software, via a chip card, USB interface or Ethernet card.
- Applications include:
  - Emergency stops
  - Two hand control
  - Safety gate limits
  - Light beam devices
  - Scanners
  - Enable switches
  - Safety gate switches
  - Operator mode switches
  - Muting
  - Safety mats
  - Safe speed monitoring (via safe encoders, sensors etc)
- Fieldbus communication modules for transmission/receipt of up to 128 non-failsafe data.

## Technical specification

Housing width	45mm (bases) 22.5mm (expanders)
Supply voltage	24V d.c.
PNOZmB0 Safe outputs	4 solid state PLe (using advanced diagnostics)
PNOZmB0 Safe inputs	20 single channel (8 config as standard outputs)
PNOZmB0 & I Test pulses	4
Connections	Plug in (either spring-loaded or screw terminal)
PNOZmulti Configurator version	
PNOZ mB0	v9.4
PNOZ mB1	v10.0

EN 954-1 Category	Cat 4
EN ISO 13849-1 Performance Level	PLe
EN 62061 SIL Claim	SIL CL 3

## Base modules

Description	Ident No.	Order Code	List Price
Base module with 20 safe digital inputs	772100	PNOZmB0	£493.45
Base module with 2 Ethernet interfaces	772101	PNOZmB1	£365.33

## Safelink modules


Description	Ident No.	Order Code	List Price
Expansion module (Multi-Multi)	772120	PNOZmEF-MULTILINK	£185.16

## Communication modules

Description	Ident No.	Order Code	List Price
Powerlink	772119	PNOZmES-POWERLINK	£249.53
Ethernet/Mobus-TCP	772130	PNOZmES-ETH	£155.08
RS232	772131	PNOZmES-RS232	£92.12
Profibus	772132	PNOZmES-PROFIBUS	£253.77
CANopen	772134	PNOZmES-CANOPEN	£253.77
CC-Link	772135	PNOZmES-CCLINK	£231.38
EtherCAT	772136	PNOZmES-ETHERCAT	£253.77
Ethernet/IP	772137	PNOZmES-ETHERNET/IP	£253.77
Profinet	772138	PNOZmES-PROFINET	£249.53

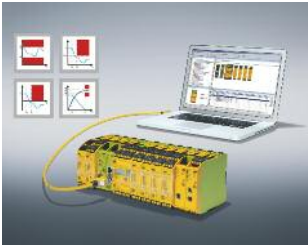
## Input/output expansion modules

Description	Ident No.	Order Code	List Price
16 digital inputs	772140	PNOZmEF-16DI	£164.49
8 digital inputs/4 digital outputs	772142	PNOZmEF-8DI4DO	£234.97
4 digital inputs /4 relay outputs	772143	PNOZmEF-4DI4DOR	£277.27
Single axis speed monitor	772170	PNOZmEF-1MM	£239.36
Dual axis speed monitor	772171	PNOZmEF-2MM	£365.06
14 standard digital outputs	772181	PNOZmES-14DO	£266.73

Go to next page for our range of accessories 

## PNOZmulti 2 system (continued)

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### Accessories

Description	Order Code	List Price
Spring terminals for PNOZmB0	751008	£20.90
Spring terminals for PNOZmB1	751016	£6.12
Spring terminals for safeLink module PNOZmEF-MULTILINK	783538	£4.44
Spring terminals for 2 axis speed monitoring modules	793544	£4.98
Spring terminals for communication modules and 1 axis speed monitor	783542	£4.36
Spring terminals for input/output cards	751004	£15.66
Basic licence PNOZmulti Configurator	773010B	£339.68
Chipcard 1 piece 32kB for PNOZmB0	779201	£5.92

## PNOZmulti Configurator tool kit

The tool kit contains the accessories you need to start working with PNOZmulti:

- Documentation folder with the PNOZmulti Configurator software (does not include a user licence)
- 10 x 32Kb chip cards
- Chip card reader
- Configuration cable for reading diagnostic data



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Description	Order Code	List Price
PNOZmulti tool kit	779000	£130.44
Basic single user licence	773010B	£339.68

## PNOZmulti Configurator and accessories

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Graphic tool for configuration and programming of the PNOZmulti.

- Project configuration, configuration generation, documentation, commissioning
- Data transfer via RS232 serial cable or chip card
- User interface in German, English, French, Italian, Spanish, Japanese or Chinese

The software is constantly evolving, but you can download the latest version from [www.pilz.co.uk/](http://www.pilz.co.uk/). You will also need to order a basic user licence from the price table below.

### Standard PC requirements

- Operating system: Windows 2000, XP, Vista(32 Bit) or 7 (32 or 64 Bit)
- Processor: Minimum 1GHz
- RAM: Minimum 1,024Mb
- Hard drive: 20Gb with a minimum of 15Gb of available disc space

### Function elements include:

- E-stops, safety gates, light curtains, muting, two hand control, enabling devices, foot mats, zero/safe speed, analogue input
- Press elements (e.g. operating mode, rotary cam)
- Burner management
- Pilz Visual (PVIS) expanded diagnostics
- Macros

### Logic elements include:

- Boolean functions AND, OR, XOR, NOT, EQU, RS FLIP-FLOP
- Timers on and off delay, pulse trains
- Event counters

Description	Order Code	List Price
Basic single user licence	773010B	£339.68
Upgrade licence	773010U	£156.77
RS232 programming cable	310300	£36.44
RS232 to USB adaptor	305160	£60.64
Chipcard 8Kb	779201	£5.92
Chipcard 32Kb	779211	£9.58
Chipcard reader	779230	£43.19



# PAScal safety calculator



## Features

- Calculates the PFF<sub>D</sub> value of safety functions on plant and machinery
- The result is verified with the prescribed performance level (PL) in accordance with EN ISO 13849 or safety integrity level (SIL) in accordance with EN/IEC 62061
- The graphical representation shows how individual components influence overall safety
- PAScal is compatible with a wide range of Sistema .SLB libraries, which can simply be imported

Compatible with both  
EN ISO 13849-I and  
EN/IEC 62061

PAScal allows users to validate safety functions to both EN ISO 13849-I and EN/IEC 62061.

- Simple handling saves time – very easy to use compared to other tools on the market
- Comprehensive component database
- Simple import and update function
- Report Generator as documentary evidence (required by the standards)

The software is constantly evolving, but you can download the latest version from [www.pilz.co.uk/](http://www.pilz.co.uk/). You will also need to order a basic user licence from the price table below.

You can download and run a demo licence version of PAScal, which gives you access to just the essential functionality. Purchasing a user licence allows you to have more than three safety functions per project and to edit reports after generation.



Description	Order Code	List Price
PAScal single user licence	850050B	£260.42
Additional PAScal user licence	850050K	£194.10