

PROTECT-SELECT

Compact safety controller



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The compact safety controller PROTECT-SELECT offers engineers high flexibility for configuring safety devices and for integrating safety devices into machine functions.

Four different basic programs are available. Each program can easily be adapted to the respective application via menu navigation and cleartext messages. Programming skills are not required. Thus e.g. the drop-out delay and debouncing times can be set individually and numerous parameters such as cross-circuit monitoring can be configured according to the requirements – a clear advantage compared to safety control modules.

All of the four programs offer numerous functions, including the following:

- Connection of up to 6 dual-channel safety switching devices (with or without potential) up to PL e/ SIL 3
- Safety semi-conductor and relay outputs with Stop 0 or Stop 1 (adjustable)
- Safe analog monitoring of temperature and other process variables
- Free assignment of feedback circuit, start-up tests, periodic tests, auto start, manual start
- Cross-circuit detection via clock outputs
- Display of cleartext messages during troubleshooting
- Input filter for safety devices with contact bounce

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- Suitable for signal processing of potential-free outputs, e.g. emergency stop command devices, position switches, solenoid interlocks with and without interlocking function and magnetic safety switches
- Suitable for the signal treatment of potential-loaded outputs, e.g. electronic safety sensors with p-type semi-conductor outputs as well as safety light grids and light curtains
- 1 or 2 channel control
- Safety outputs with Stop 0/1 function and free adjustable fail-safe timer
- Automatic or manual reset function
- Optionally with short-circuit recognition
- Input filter for safety devices with contact bounce
- LEDs to show operating conditions

Technical data

Standards:	ISO 13849-1; IEC 61508; IEC 62061; IEC 60204-1; IEC 60947-5-1
Start conditions:	Automatic or manual (adjustable)
Feedback circuit (Y/N):	adjustable
Rated operating voltage U_e :	24 VDC \pm 10%
Fuse rating for the operating voltage:	3 A slow blow, external
Internal electronic protection (Y/N):	yes
Digital safety inputs:	
- Short-circuit recognition:	optional
- Wire breakage detection:	yes
- Earth connection detection:	yes
Number of NC contacts, 2 channel:	application dependent, max. 6
Number of NC/NO contacts:	application dependent, max. 6
Max. conduction resistance:	max. 300 Ω
Safe analogue inputs:	
Number:	2
Measurement range:	0 ... 10 VDC
Accuracy:	typ. 3 % (max. cable length < 30 m)
Resolution:	12 Bit
Safety semi-conductor outputs:	
Stop category:	0 or 1 (adjustable)
Number (p-/n-type):	1
Number (p-type):	2
Max. switching capacity:	24 VDC at 0.7 A; ohmic load, short-circuit proof
Safety relay outputs:	
Number:	2 (common access)
Contact load capacity:	AC-1: 250 V / 4 A; AC-15: 230 V / 3 A; DC-1: 24 V / 4 A; DC-13: 24 V / 4 A / 0.1 Hz
Signalling outputs:	
Number:	optional 4
Max. switching capacity:	24 VDC at 0.1 A; ohmic load, short-circuit proof
Clock outputs:	
Number:	3
Max. current at:	24 VDC at 0.1 A; ohmic load, short-circuit proof
Switch-off test pulse:	< 1.5 ms
Ambient conditions:	
Ambient temperature:	-25 °C ... +55 °C
Storage and transport temperature:	-40 °C ... +85 °C
Installation:	vertical, no condensation
Installation compartment:	Earthed, lockable switch cabinet with class of protection IP54
Protection class:	IP20
Mounting:	Snaps onto standard DIN rail to EN 60715
Connection type:	Cage clamps or screw terminals
- min. cable section:	0.25 mm ²
- max. cable section:	2.5 mm ²
Weight:	300 g
Dimensions (Height x Width x Depth):	100 x 52.5 x 118 mm

Approvals



Ordering details

PROTECT-SELECT-①

No.	Option	Description
①	SK	Screw terminals
	CC	Cage clamps

Classification

Safety parameters:

Standards:	ISO 13849-1; IEC 61508; IEC 62061;
PL:	up to e
Category:	up to 4
DC:	high
CCF:	> 65 points
SIL CL:	up to 3
SFF:	> 90%
PFF _d :	1,6 x 10 ⁻⁸ /h (Valid for dual channel and 60% relay load)
Mission time:	20 years
Hardware fault tolerance:	1
Request rate:	High and continuous
MTTF _d (inputs+logic + semi-conductor outputs):	>100 years
B _{10d} value (for one channel of the relay output):	Small load range: 20%: 10.000.000 40%: 7.500.000 60%: 2.500.000 80%: 1.000.000 Maximum load: 100%: 400.000

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Application program 1

One safety area with operating mode switch / enabling switch

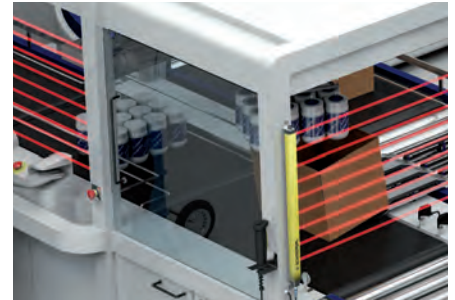
The program 1 allows to connect up to four dual-channel safety switching devices, each of which can be bridged by means of operating mode switches and enabling switches. The program is ideally suited for hazardous areas where additional operating modes such as "setting-up mode" and "process monitoring" are facilitating tasks like setting up a machine or troubleshooting.

- Up to 4 safety switching devices can be bridged in conformance with standards
- Additional emergency stop function
- Direct control of a solenoid interlock (lock/unlock)



Clear view onto process

Additional operating modes can be useful e.g. when a machine needs to be set-up or adjusted after a tool change.



Setting-up mode and process monitoring

Operating modes such as the setting-up mode and process monitoring can be realised with PROTECT-SELECT and application program 1.

Application program 2

Two safety areas

It is often useful to provide two separate safety areas for the particular workplaces on machines. Program 2 has been developed for this application. Here is an example from the packaging machine industry: The upper part of the machine is the work area, where packaging units are fed and packaged.

The lower part of the machine houses the material feed mechanism and the drive units. It must only be accessed for maintenance purposes, but must still be monitored with a safety switching devices. This functionality can be achieved with application program 2 of PROTECT-SELECT.

- For up to 2 or 3 safety switching devices per safety area
- Start/reset function for each safety area
- Feedback circuits for each safety area
- Prioritised emergency stop with independent reset function



Work area

The work area can be protected by up to 3 safety switching devices which can be configured individually.



Service / material supply

The area below (or above) the work area is considered to be an independent safety area and is thus configured separately.

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Application program 3

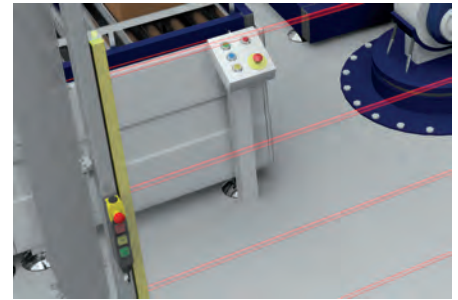
One safety area with up to six safety switching devices

Program 3 can be used for processing signals of up to 6 safety switching devices. The application program allows to assign a separate reset function to one of the safety switching devices. This way even the most complex safety areas which are monitored by several safety switching devices can be conveniently configured.

- For up to 6 safety switching devices
- Direct control of a solenoid interlock (lock / unlock)
- Prioritised emergency stop with independent reset function



Many switching devices – one evaluation
PROTECT-SELECT operating in program 3 replaces up to 6 safety control modules and thus helps saving money and space in the control cabinet.



Multi-purpose use
Program 3 is e.g. ideally suited for safety areas which are monitored by several safety switching devices.

Application program 4

One safety area with safe bridging (muting)

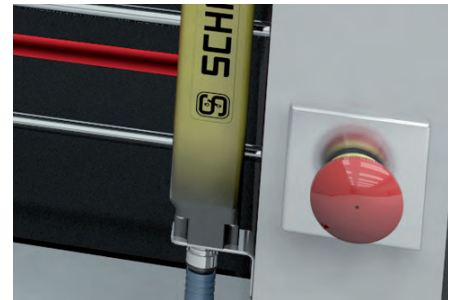
In order to ensure a material transport into and out of a safety area without provoking a machine stop, an optoelectronic safety device which is bridged automatically and for a limited amount of time should be used.

Usually a safety light-grid with integrated muting function is required for this purpose. When PROTECT-SELECT is used, the muting function can be monitored directly via standard safety light-grids and sensors. In addition, signals from 2 other safety switching devices can be processed. This enables the user to realise a complete muting application with e.g. an additional guard door and an emergency stop function.

- Muting function with standard optoelectronic safety devices
- Flexible muting time parameterization
- Connection of additional emergency stop and safety switching device
- Direct control of a solenoid interlock (lock / unlock)



Muting boosts productivity
The muting function enables safe monitoring of the access to the hazardous area without interruptions of the material flow or the work flow.



All functions combined in one module
All safety functions for safety areas with muting are controlled via one PROTECT-SELECT unit – including e.g. a solenoid interlock and an emergency stop function.