

Multi-functional safety relay modules

PROTECT SRB-E



PROTECT SRB-E

The configurable



User-friendly

- Up to 16 different applications can be selected
- Monitoring of all conventional safety switchgear
- Safety level of up to PL e / SIL 3 can be achieved
- Simple adjustment using rotary switch
- Selected application can be locked using seal
- Quick response time (< 10 ms) to request
- Excellent switching performance and short cycle times
- Slot-in termination with coding

Compact

- Installation width for all device variants 22.5 mm
- Up to 24 connecting terminals
- Up to 10 safe inputs and 5 safe outputs
- Up to 4 signalling outputs

SRB-E modules

Flexible

- 1 or 2 channel signal evaluation
- Contact configuration can be selected for the sensors
- Start / Reset functions with monitoring
- Input expanders for 4 sensors up to PL e
- Cascading via safe inputs
- Combined evaluation for 2 safety guards
- Two-hand control monitoring according to type IIIC
- STOP Category 0 and 1
- Detects standstill using 1 or 2 impulse sensors
- Additional standstill signal as an option
- Standstill frequency 0.5 Hz ... 10 Hz
- Fail-safe delay timer
- Actuation delay time adjustable from 0.5 ... 3000 sec.





Safety relay modules SRB-E for a range of applications

All versions of the family of safety relay modules PROTECT SRB-E can be used in applications up to Cat. 4 / PL e in accordance with ISO 13849-1 and up to SIL 3 in accordance with IEC 62061 / IEC 61508.

A major advantage of the new SRB-E series is its multi-functionality which allows all the variants to be used with several existing SRB modules. Each module can be configured for up to 12 different applications via a simple control element.

All conventional safety sensors and electromechanical safety equipment can be monitored.

Adjustable configuration and applications

Rotary knob position	Reset button (detection of the trailing edge)	Cross-wire monitoring active	Contact configuration for safety switchgear	Sensor monitoring for synchronicity (< 5 s)
1	Yes	Yes	NC / NC	Yes
2	Yes	Yes	NC / NC	No
3	Yes	No	NC / NC	Yes
4	Yes	No	NC / NC	No
5	Yes	Yes	NC / NO	Yes
6	Autostart	Yes	NC / NO	No
7	Autostart	Yes	NC / NC	Yes
8	Autostart	Yes	NC / NC	No
9	Autostart	No	NC / NC	Yes
10	Autostart	No	NC / NC	No
11	Function two-hand control type IIIC (SRB-E-201ST)		NC, NO / NC, NO	< 0.5 s (triggering of actuators)
C	Configuration Mode			

Adjusting configuration and application



The function is set using the rotary switch "mode".



Adjustment of drop-out delay via rotary switch "time".

Diagnostics / Status / Visualisation

Signalling of status messages using LED displays

LED	Function	Display type
RUN	- Operating voltage OK - Ready for operation - Not a valid application	Continuously lit Continuously lit Flashes
In 1	- Input S12 closed - Time window for synchronicity exceeded - Second channel, input S22 has not opened	Continuously lit Flashes quickly Flashes slowly
In 2	- Input S22 closed - Time window for synchronicity exceeded - Second channel, input S22 has not opened	Continuously lit Flashes quickly Flashes slowly
Out	- Safety outputs ON - No release signal on input X7 - Safety outputs waiting for start (input X2) - Feedback circuit not closed (input X3)	Continuously lit Flashes quickly Flashes slowly Flashes slowly

Errors and fault sources are indicated using flashing signals

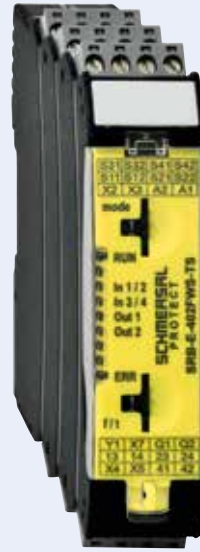
LED	Error cause	Short flash	Long flash
ERR	Operating voltage too low	1	1
	Operating voltage too high	1	2
	Invalid rotary switch setting	1	3
	External voltage on output Q1	1	4
	External voltage on output Q2	1	5
	Termination to GND on output Q1	2	6
	Termination to GND on output Q2	2	3
	Cross-wire between inputs S12 and S22	2	4
	Undefined level on X2, X3, X7, S12, S22	Differentiated flash codes	
	Rotary switch mode changed	Quick flashing signals on all LEDs	

New module with several functions combined into one module



SRB-E-302FWS-TS

Two functions combined into one module
 With the new safe evaluation feature, the functions of "Safe standstill monitoring" and "Safe time relay" are comprised in one component in the basic version SRB-E-302FWS-TS.



SRB-E-402FWS-TS

New module with three functions
 With the additional function "Safety guard monitoring", one device features three functions! This sets it apart from others in the market.

Safety standstill monitoring, safe time monitoring and safety guard monitoring

Safe standstill monitoring

Monitors the impulses of the connected sensors. Permanent comparison of the input frequencies (actual value) with the preset standstill frequency (target value) makes it possible for the device to detect threshold violations and activate the safety outputs.

Fail-safe delay timer

In the case of rotating plant system parts (e.g. drive units, engines/motors or shafts) with the same run-on times, the SRB-E-FWS-TS modules can also be used as safe time relays.

Safety guard monitoring

The SRB-E-402FWS-TS version offers the additional means of monitoring a solenoid interlock through two channels with or without short-circuit recognition.

Setting of the function "Standstill monitoring"

Position	Rotary switch "mode"			Rotary switch "f / t"	
	1 or 2 sensors	2 sensors with level monitoring	Standstill signal	Position	Cut-off frequency
1	Yes	–	No	1	0.5 Hz
2	–	Yes	No	2	1 Hz
3	Yes	–	Yes	3	2 Hz
C	Configuration mode			4	3 Hz
				5	4 Hz
				6	5 Hz
				7	8 Hz
				8	10 Hz

Adjusting configuration and application



The function is set using the rotary switch "mode".



The cut-off frequency and actuation delay time setting is carried out using the rotary switch "f / t".

Setting of the function "Time relay"

Position	Rotary switch "mode"			Timebase	Position	Rotary switch "f / t"			
	Contact configuration Synchronism < 5 s	Cross-wire monitoring				Time 1	Time 2	Time 3	Time 4
					1	0.5 s	35 s	120 s	300 s
					2	1.0 s	40 s	130 s	400 s
					3	1.5 s	45 s	140 s	500 s
4	NC / NO	Yes	Time 1	4	2.0 s	50 s	150 s	600 s	
5	NC / NO	Yes	Time 2	5	2.5 s	55 s	160 s	700 s	
6	NC / NO	Yes	Time 3	6	3 s	60 s	170 s	800 s	
7	NC / NO	Yes	Time 4	7	4 s	65 s	180 s	900 s	
8	NO / NO	No	Time 1	8	5 s	70 s	190 s	1000 s	
9	NO / NO	No	Time 2	9	8 s	75 s	200 s	1200 s	
10	NO / NO	No	Time 3	10	10 s	80 s	210 s	1400 s	
11	NO / NO	No	Time 4	11	12 s	85 s	220 s	1600 s	
12	NO / NO	Yes	Time 1	12	15 s	90 s	230 s	1800 s	
13	NO / NO	Yes	Time 2	13	18 s	95 s	240 s	2000 s	
14	NO / NO	Yes	Time 3	14	20 s	100 s	250 s	2300 s	
15	NO / NO	Yes	Time 4	15	25 s	105 s	260 s	2600 s	
C	Configuration mode			C	30 s	110 s	270 s	3000 s	

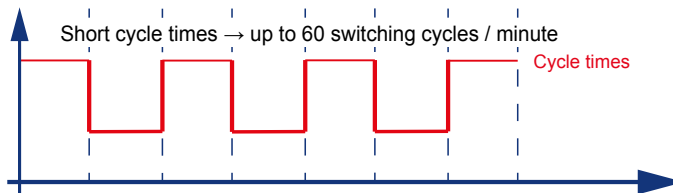
Connection option for all standard safety switchgear



Safe semi-conductor outputs Cat. 4 / PL e

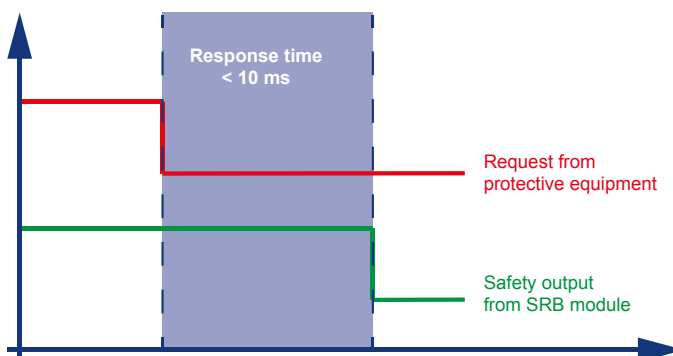
The **PROTECT SRB-E-201ST** variant is characterised by p-switching fail-safe performance semiconductor outputs with switching capacity of up to 5.5 A.

This variant is particularly suited to fail-safe applications with high switching capacity in conjunction with short cycle times, for example switching valve terminals or complete output modules.



Very quick request response times

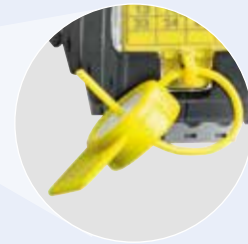
Very short response times for SRB-E modules of less than 10 ms from the request of the protective equipment to the safety output switching off.



Sealing the transparent front panel cover



Once the rotary switch has been used to set the configuration required and commissioning is complete, the transparent front panel cover can be secured using a conventional seal.



Equipment label

The equipment label allows individual project and device assignment without additional organisational tools. This allows quick assignment of the electrical equipment in the event of maintenance work or trouble-shooting.

Standard label signs can be glued or snapped into the space provided on the front of the housing.



Ordering example:

PROTECT SRB-E-322ST-CC

Series	
E	Electronic
Number of safety outputs STOP 0	
2	2 safety outputs STOP 0
3	3 safety outputs STOP 0
4	4 safety outputs STOP 0
Number of safety outputs STOP 1	
0	0 safety outputs STOP 1
1	1 safety output STOP 1
2	2 safety outputs STOP 1
Number of signalling outputs	
1	1 signalling output
2	2 signalling outputs
4	4 signalling outputs

Connection	
	Plug-in screw connection
CC	Cage clamp
Design	
ST	Standard
LC	Low current
PE	Port extension
FWS	Frequency Watchdog Safety
TS	Timer Safety

Applications and functions

PROTECT SRB-E Standard	Applications								Input signals				Start conditions	
													Start button / autostart	Start button with edge detection
SRB-E-201ST	■	■	■	■	■	■	■		▲	▲	▲	▲	▲	▲
SRB-E-201LC	■	■	■	■	■				▲	▲	▲	▲	▲	▲
SRB-E-301MC	■	■	■	■	■				▲	▲		▲	■	
SRB-E-301ST	■	■	■	■	■				▲	▲	▲	▲	▲	▲
SRB-E-212ST	■	■	■	■	■				▲	▲	▲	▲	▲	▲
SRB-E-322ST	■	■	■	■	■				▲	▲	▲	▲	▲	▲
SRB-E-232ST	■	■	■	■	■				▲	▲	▲	▲	▲	▲
SRB-E-204ST	■	■	■	■	■	■			▲	▲	▲	▲	▲	▲
SRB-E-204PE	■	■	■	■	■	■			▲	▲	▲	▲	■	
Combination module for 2 protective devices														
SRB-E-402ST	■	■	■	■	■		■		▲	▲	▲	▲	▲	▲
Standstill monitoring – Time monitoring – Safety guard monitoring														
SRB-E-302FWS-TS							■		▲	▲	▲	▲		
SRB-E-402FWS-TS	■	■	■	■	■		■		▲	▲	▲	▲		

Technical data

Technical data	SRB-E-201LC	SRB-E-201ST	SRB-E-301MC	SRB-E-301ST	SRB-E-212ST
Supply voltage	24 VDC -20% / +20%	24 VDC -20% / +20%	24 VAC / VDC -20% / +20%	24 VAC / VDC -20% / +20%	24 VDC -20% / +20%
Diagnostic and status display	5 LED's	5 LED's	5 LED's	5 LED's	6 LED's
Number of safe inputs	5	5	4	4	5
Switching capacity of the safety contacts	–	–	3 x 230 V / 6 A	3 x 230 V / 6 A	2 x 230 V / 6 A
of the safe semi-conductor outputs	2 x 24 V / 2 A	2 x 24 V / 5.5 A	–	–	1 x 24 V / 2 A
of the auxiliary contacts	–	–	1 x 24 V / 1 A	1 x 24 V / 1 A	–
of the signalling outputs	1 x 24 V / 100 mA	1 x 24 V / 100 mA	–	–	2 x 24 V / 100 mA
Max. switching cycles / minute	60	60	20	20	20
Drop-out delay STOP 0	< 10 ms				
Dimensions (H x W x D)	98 x 22.5 x 115 mm				
Cable section (plug-in)	0.25 ... 2.5 mm ²				
Ambient temperature	-25 °C ... +60 °C				
Safety classification	PL e / SIL 3				
Approvals					

Output contacts						Operating voltage	Type designation	Material number
Safe STOP 0	Safe STOP 1		not safe					
						24 VDC	SRB-E-201ST	103008067
	2				1	24 VDC	SRB-E-201LC	103009970
3				1		24 VAC/DC	SRB-E-301MC	103014374
3				1		24 VAC/DC	SRB-E-301ST	103007672
2			1		2	24 VDC	SRB-E-212ST	103007222
3			2	1	1	24 VDC	SRB-E-322ST	103008184
	2	3		1	1	24 VDC	SRB-E-232ST	103014308
	2				4	24 VDC	SRB-E-204ST	103009973
	2				4	24 VDC	SRB-E-204PE	103008070
2	2			1	1	24 VDC	SRB-E-402ST	103007221
2	1				2	24 VDC	SRB-E-302FWS-TS	103014754
2	2			1	1	24 VDC	SRB-E-402FWS-TS	103014757

Key	
	Safety guard monitoring
	Magnetic safety sensors BNS
	Emergency stop monitoring
	Pull-wire emergency stop switch / position switch
	AOPD monitoring
	Two-hand control panels
	Safe standstill monitoring
	Input expander module for up to 4 sensors
	Input signals: 1-channel
	Input signals: 2-channel
	Input signals: antivalent
	Cross-wire detection
	Safety output contacts, STOP 0
	Safety output contacts, STOP 1
	Non-safe output contacts: Auxiliary contacts
	Non-safe output contacts: Semi-conductor
■	Yes
▲	optional

SRB-E-322ST	SRB-E-232ST	SRB-E-204ST	SRB-E-204PE	SRB-E-402ST	SRB-E-302FWS-TS	SRB-E-402FWS-TS
24 VDC	24 VDC	24 VDC	24 VDC	24 VDC	24 VDC	24 VDC
-20% / +20%	-20% / +20%	-20% / +20%	-20% / +20%	-20% / +20%	-20% / +20%	-20% / +20%
6 LED's	6 LED's	7 LED's	7 LED's	6 LED's	6 LED's	6 LED's
5	5	10	10	7	5	7
3 x	3 x	-	-	2 x	2 x	2 x
230 V / 6 A	230 V / 6 A	-	-	230 V / 6 A	230 V / 6 A	230 V / 6 A
2 x	2 x	2 x	2 x	2 x	1 x	2 x
24 V / 2 A	24 V / 2 A	24 V / 2 A	24 V / 2 A	24 V / 2 A	24 V / 2 A	24 V / 2 A
1 x	1 x	-	-	1 x	-	1 x
24 V / 1 A	24 V / 1 A	-	-	24 V / 1 A	-	24 V / 1 A
1 x	1 x	4 x	4 x	1 x	2 x	1 x
24 V / 100 mA	24 V / 100 mA	24 V / 100 mA	24 V / 100 mA	24 V / 100 mA	24 V / 100 mA	24 V / 100 mA
20	20	60	60	20	20	20

< 10 ms

98 x 22.5 x 115 mm

0.25 ... 2.5 mm²

-25 °C ... +60 °C

PL e / SIL 3





The Schmersal Group

In the demanding field of machine safety, the owner-managed Schmersal Group is one of the international market leaders. The company, which was founded in 1945, has a workforce of about 2000 people and seven manufacturing sites on three continents along with its own companies and sales partners in more than 60 nations.

Customers of the Schmersal Group include global players from the area of mechanical engineering and plant manufacturing as well as operators of machinery. They profit from the company's extensive expertise as a provider of systems and solutions for machine safety. Furthermore, Schmersal specialises in various areas including foodstuff production, the packaging industry, machine tool industry, lift switchgear, heavy industry and the automotive industry.

A major contribution to the systems and solutions offered by the Schmersal Group is made by tec.nicum with its comprehensive range of services: certified Functional Safety Engineers advise machinery manufacturers and machinery operators in all aspects relating to machinery and occupational safety – and do so with product and manufacturer neutrality. Furthermore, they plan and realise complex solutions for safety around the world in close collaboration with the clients.

Safety Products



- Safety switches and sensors, solenoid interlocks
- Safety controllers and safety relay modules, safety bus systems
- Optoelectronic and tactile safety devices
- Automation technology: position switches, proximity switches

Safety Systems



- Complete solutions for safeguarding hazard areas
- Individual parametrisation and programming of safety controllers
- Tailor-made safety technology – be it for individual machines or a complex production line
- Industry-specific safety solutions

Safety Services



- tec.nicum academy – Seminars and training
- tec.nicum consulting – Consultancy services
- tec.nicum engineering – Design and technical planning
- tec.nicum integration – Execution and installation

The details and data referred to have been carefully checked.
Subject to technical amendments and errors.

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