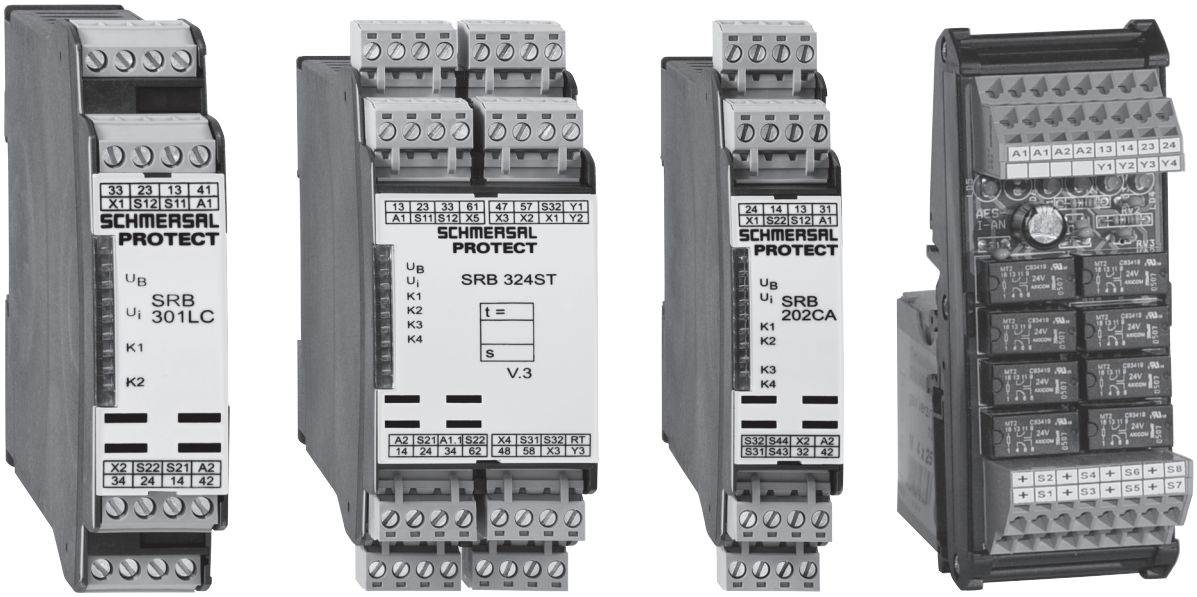
GENERAL & SPECIFIC-PURPOSE SAFETY CONTROLLERS



GENERAL PRODUCT FEATURES

SCHMERSAL's PROTECT Series Safety Controllers have been designed to satisfy a wide range of application requirements. Features include:

- Removable, plug-in screw terminals
- Compact size
- Electronic fuses
- Feedback monitoring
- Convection-cooled housings
- PNP and/or dry contact monitoring capability
- Stop category 0 and Stop category 1 models
- Cross short monitoring
- Multiple-voltage operation
- Models compliant with PL_d/control category 3 or PL_e/control category 4
- Monitored manual reset

Protect SERIES

SAFETY CONTROLLERS

SELECTION GUIDE

Model	Operating Voltage (U_B)	Types of Inputs Monitored	Number of Input Devices Monitored**	Number of Safety Outputs	Number of Auxiliary Outputs	Feedback Monitoring	Type of Reset	Cross-short Monitoring	Page Number
SRB 201 ZH	24V DC	Two-hand control (dry contacts)	2	2	1 N.C.	Yes	Automatic	Yes	322
SRB 301 HC/R	24V AC/DC or 48-230V AC	Two-hand control (dry contacts)	2	3	1	Yes	Monitored-manual	Yes	322
SRB 202 MSL	24V DC	Muting module	2	2	2	Yes	Automatic	Yes	324
SRB 206 ST*	24V AC/DC or 48-230V AC	Dry contacts	6	2	6 (Semi-conductor)	Yes	Monitored-manual or Automatic	No	326
SRB 206 SQ*	24V AC/DC or 48-230V AC	Dry contacts	6	2	6 (Semi-conductor)	Yes	Monitored-manual or Automatic	Yes	326
SRB 211 AN	24V AC/DC	Dry contacts Coded Magnets	1	2 (stop category 0) 1 (stop category 1)	1 (Semi-conductor)	Yes	Monitored-manual or Automatic	Yes (selectable)	328
SRB 211 ST	24V AC/DC	Dry contacts or PNP-type outputs Coded Magnets	1	2 (stop category 0) 1 (stop category 1)	1 (Semi-conductor)	Yes	Monitored-manual or Automatic	Yes (selectable)	330
SRB 301 LC or SRB 301 LCI	24V AC/DC	Dry contacts or PNP-type outputs	1	3	1 N.C.	Yes	Manual or Automatic	Yes (selectable)	332
SRB 301 LC/B	24V AC/DC	Dry contacts or PNP-type outputs Coded Magnets	1	3	1 N.C.	Yes	Manual or Automatic	Yes (selectable)	334
SRB 301 MC	24V AC/DC	Dry contacts or PNP-type outputs Coded Magnets	1	3	1	Yes	Manual or Automatic	Yes (selectable)	336
SRB 301 ST	24V AC/DC	Dry contacts or PNP-type outputs Coded Magnets	1	3	1 N.C.	Yes	Monitored-manual or Automatic	Yes (selectable)	338
SRB 301 ST-230V	48V-230V AC	Dry contacts	1	3	1 N.C.	Yes	Monitored-manual or Automatic	No	338
SRB 301 SQ-230V	48V-230V AC	Dry contacts	1	3	1 N.C.	Yes	Monitored-manual or Automatic	Yes	338
SRB 324ST	24V AC/DC	Dry contacts or PNP-type outputs Coded Magnets	1	3 (stop category 0) 2 (stop category 1)	1 N.C. plus 3 semi-conductors	Yes	Monitored-manual or Automatic	Yes	340
SRB 401 LC	24V AC/DC	Dry contacts	1	4	1	Yes	Manual or Automatic	Yes	344
SRB 504 ST	24V AC/DC	Dry contacts or PNP-type outputs Coded Magnets	1	5	4	Yes	Monitored-manual or Automatic	Yes	348

*Suitable for use in systems designed for up to PL_d per EN iSO 13849-1 or Safety Control Category 3 per EN954-1. **Without daisy-chaining
All others are suitable for use in systems up to PL_e per EN iSO 13849-1 or Safety Control Category 4 per EN954-1.

DIFFERENTIATED-INPUT SAFETY CONTROLLERS

SRB 202 C	24V DC	Dry Contacts	2	2	2 N.C.	Yes	Depends upon model***	Depends upon model***	342
SRB 400 C	24V DC	Dry Contacts	2	4	None	Yes	Depends upon model***	Depends upon model***	342

***Please see selection chart on page 342.

SAFETY OUTPUT EXPANSION MODULE

SRB 402 EM	24V AC/DC	N/A	N/A	4	2 N.C.	Yes	Automatic	N/A	346
SRB 401 EM	115V AC	N/A	N/A	4	1	Yes	Automatic	N/A	346

INPUT EXPANSION MODULE

Protect-IE	24V DC	Dry contacts	4	N/A	4	N/A	N/A	Yes	350
Protect-PE	24V DC	Dry/PNP contacts	4	N/A	4	N/A	N/A	Yes	352

NOTE: For FWS and AZS Series, please refer to the Safe Speed section on page 363.
For AES Series, please refer to the BNS section on page 147.
For SRB 301 HC/T and /R Series, please refer to the Safety Mat section on page 306.

SAFETY CONTROLLER SELECTION CRITERIA

It helps the selection process to view a safety controller as having four basic characteristics, each determined by the application requirements. This approach can be applied to any safety controller.

FOUR BASIC SAFETY CONTROLLER CHARACTERISTICS

SUPPLY VOLTAGE REQUIREMENTS

Select your supply voltage. While many voltages are possible (24VDC, 24VAC, 24VAC/DC, 115VAC and 230VAC), 24 VDC gives the most flexibility since virtually all controllers are available in this voltage. Also, since a transformer and rectifier are not required, this unit generally is less expensive and smaller than a 115VAC model.

It is important to recognize that the safety controller supply voltage is always converted by the controller electronics to 24VDC for internal operation and for powering monitored input devices. Hence monitored input devices need only be rated for 24VDC.

INPUT MONITORING REQUIREMENTS

The first step is to determine whether you need single channel (up to Safety Control Category 2) or dual-channel (Control Category 3 & 4) operation.

Single-channel systems must monitor one N.C. positive-break contact. Dual-channel systems can monitor 1 N.O./1 N.C. or 2 N.C. contacts. Generally, these need to be isolated dry contacts since most controllers will view C-form contacts as a short circuit. Remember that 24VDC is supplied by the safety controller for monitoring these contacts.

Safety controllers are also available for monitoring non-potential free contacts (such as PNP outputs from light curtains). Models are also available that allow users to field select the monitored contact configuration.

Another consideration is crossed wire detection (a short between channels). This requires special circuitry in the safety controllers and is required for Safety Control Category 4 safety control systems.

FEEDBACK & RESET CIRCUIT REQUIREMENTS

Safety controllers with feedback capability can also monitor control relays and motor contactors with positive-guided contacts. Such feedback is required for Safety Control Category 3 & 4 systems. A NC auxiliary contact is wired into the feedback loop (with or without a reset (start) button) to detect welded contacts in these external control devices. The safety controller detects the existence of a weld when the relay shuts down due to a power loss or open machine guard and prevents a restart.

In order to reset the controller, the feedback loop must be closed (at least temporarily). If the NC auxiliary contact stays open due to a contact weld, the controller cannot be reset.

Safety Control reset can be automatic or be achieved using the edge of a 24VDC reset signal. With automatic reset the controller will automatically reset (outputs close) when the machine guard is closed. Alternately, a reset or start button (manual reset) can be added to the feedback loop if desired. The controller only needs to momentarily see a 24VDC signal at the feedback terminals to reset.

With a monitored-manual reset, some type of pushbutton is required. For monitored-manual resets, the feedback loop circuitry is designed so that it needs to see a 24V to 0V transition (trailing edge) in order to reset. This method of reset is generally required when a person can actually get inside a machine guard (where they would be at risk if the equipment should automatically restart when the guard closes).

OUTPUT REQUIREMENTS

Determine the number and type of safety controller outputs required for machine control elements and signaling. Following are the typical types of safety controller outputs:

A. N.O. safety enable circuits — either instantaneous or timed.

B. N.O. or N.C. auxiliary relay contacts — these are not to be used for safety functions, but only for annunciation/signaling.

C. Semiconductor outputs for annunciation.

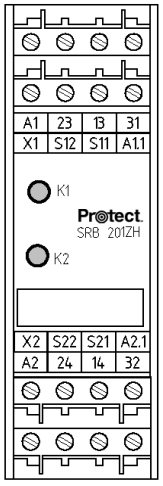
SERIES SRB 201 ZH & SRB 301 HC/R

Two-Hand Control Safety Controller

Description

The Model SRB 201 ZH is designed expressly for use with two-hand control units. It is equipped for connection to two actuators … each with 1Normally-Open (N.O.) and 1 Normally-Closed (N.C.) dry contacts. Both actuators (inputs) must be operated simultaneously (that is, within 500ms as required by EN574 type III/C requirements for machine operation to be enabled. Should the input actuators not be simultaneously operated within this specific 500ms period, both must be released before a start cycle can be initiated.

Front View*



TECHNICAL FEATURES*

Input Voltage	24 VDC
# Discrete Input Devices Monitored	2
Compatible Input Device Contact Configuration	1 N.O. & 1 N.C. (Dry Contacts)
Number & Type Safety Outputs	2 N.O. (Dry Contacts)
Number & Type Auxiliary (Non-Safety or Signalling Output)	1 N.C. (Dry Contact)
Typical Input Devices Monitored	Two-hand control
Type of Reset	Automatic
Feedback Monitoring	Yes
LED Displays	Green LEDs for: • K1 (safety relay 1) • K2 (safety relay 2)
Conformity to Standards	UL, CSA, BG (CE-compliant)
Stop Category	0
Safety Classification	PL_e, per EN ISO 13849-1 Category 4, per EN 954-1
Selected Features	• Plug-in screw terminals • Electronic fuse • Cross-short recognition • Automatic reset

AVAILABLE MODELS

Model Number	Operating Input Voltage
SRB 201 ZH	24V DC
SRB 301 HC/R-24V**	24V AC/DC
SRB 301 HC/R-230V**	48-240V AC

* For model SRB 201 ZH only

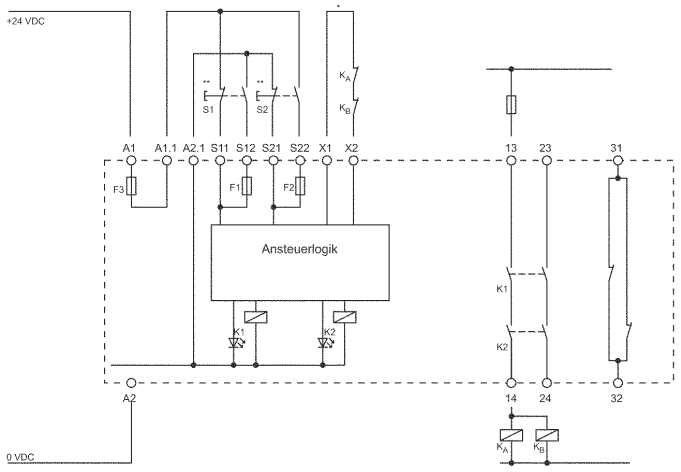
**Please refer to page 320 in the SMS section for specifications on the SRB 301 HC/R

SERIES SRB 201 ZH & SRB 301 HC/R

MECHANICAL SPECIFICATIONS*

Dimensions (W x H x D)	22.5mm x 100mm x 121mm (0.9" x 3.9" x 4.75")
Ambient Operating Temperature Range	-25°C to +45°C (-13°F to +113°F)
Mechanical Life Expectancy	10^7 switching cycles
Weight	200 gm
Mounting	DIN rail

TYPICAL WIRING DIAGRAM*



ELECTRICAL SPECIFICATIONS*

Operating Voltage	24 VDC -15% / +20%, residual ripple max. 10%
Power Consumption	1.2 W (max.)
Fuse (Input Power)	Internal electronic fuse* F1, F2 : tripping current >.02 A F3 : tripping current >.06 A (Hybrid)
Fuse (Safety Outputs)	6 A Slow-blow (Recommended)
Switching Capacity (Safety Outputs)	230 VAC, 6 A Resistive (inductive with suitable suppressor circuit)
Switching Capacity (Auxiliary Contacts)	24 VDC, 2 A
Application Category	AC 15 / DC 13 : EN 60 947-5-1
Pick-up Delay	≤ 50 ms
Drop-out Delay	≤ 30 ms
Contact Type & Materials	AgSnO self cleaning, positively driven
Contact Resistance	100 mOhm (max. in new state)
Air Clearance & Creepage Distance	DIN VDE 0110-1 (04.97), 4 kV/2
Cable Connections	• Plug-in self-lifting screw terminals for 13 to 20 AWG • Stranded or multi-core with wire end ferrule
Terminal Labeling	DIN EN 50 005 / DIN 50 013

*Resets automatically after a short time-delay.

TERMINAL CONNECTIONS*

Supply Voltage (24VDC): A1, A2

Monitored Input #1 (N.O. Contact): A2.1, S12

Monitored Input #1 (N.C. Contact): A1.1, S11

Monitored Input #2 (N.O. Contact): A1.1, S22

Monitored Input #2 (N.C. Contact): A2.1, S21

Safety Output #1 (N.O.): 13, 14

Safety Output #2 (N.O.): 23, 24

Feedback Monitoring with Automatic Reset: X1, X2

Auxiliary Output (N.C.): 31, 32

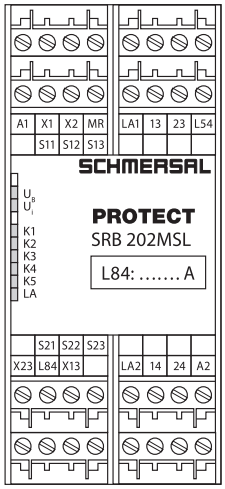
SERIES SRB 202 MSL

Muting Safety Controller (for dry contact & PNP-type input monitoring)

Description

A muting safety controller permits the safety function to be temporarily disabled for reasons related to equipment or machine work cycles. Disabling the safety function for a limited period of time is referred to as “muting.” Muting is used to permit the access of materials of production and prevent access by personnel. A typical muting application is for pallet entrance and/or exit from a hazardous area (palletizing). Activation and subsequent de-activation of the muting function must be achieved using two or more hard-wired and independent signals (i.e., limit switches, optical or proximity sensors) activated by a proper time or space sequence.

Front View



TECHNICAL FEATURES

Input Voltage	24V DC
# Discrete Input Devices Monitored	2-4 (muting sensors)
Compatible Input Device Contact Configuration	N.C. (dry contacts) or PNP switching
Number & Type Safety Outputs	2 N.O. (dry contacts)
Number & Type Auxiliary (non-safety or signalling outputs)	2 (24V / 50mA max.)
Typical Input Devices Monitored	• Limit switches • Devices with PNP outputs
Type of Reset	Automatic
Feedback Monitoring	Yes
LED Displays	Green LEDs for: • LA (muting lamps) • K1-K5 (safety relays 1-5) • U_B-U_I (voltage at input terminals & beyond fuse)
Conformity to Standards	UL, CSA, BG (CE-compliant)
Stop Category	Function of master safety controller
Safety Classification	PL_e, per EN ISO 13849-1 Category 4, per EN 954-1
Selected Features	• Cross-short recognition • Electronic fuse • Automatic reset • Plug-in screw terminals • Feedback monitoring

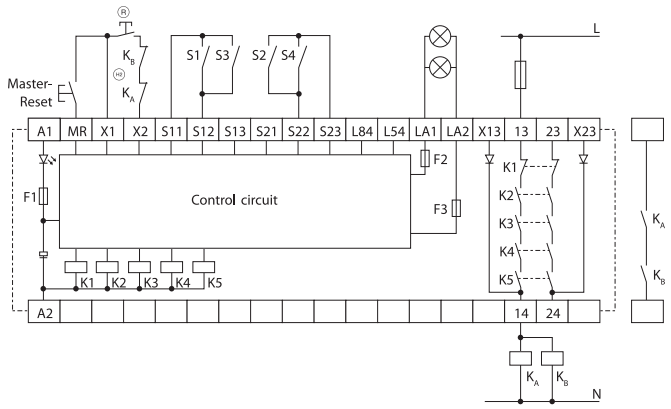
AVAILABLE MODELS

Model Number	Operating Voltage
SRB 202 MSL	24V DC

MECHANICAL SPECIFICATIONS

Dimensions (W x H x D)	45mm x 100mm x 121mm (1.8" x 3.9" x 4.75")
Ambient Operating Temperature Range	-25°C to +45°C (-13°F to +113°F)
Mechanical Life Expectancy	>10^7 switching cycles
Weight	400 gm (0.88 lbs.)
Mounting	DIN rail

Typical Wiring Diagram



ELECTRICAL SPECIFICATIONS

Operating Voltage	• 24V DC -15% / +20%, residual ripple max. 10%
Power Consumption	5.6 W, plus power consumption of muting sensors and muting indicator lamps
Fuse (input power)	Internal electronic fuse, tripping current > 1.25 A
Fuse (safety outputs)	4 A slow-blow (recommended)
Switching Capacity (safety outputs)	230V AC, 4 A Resistive (inductive with suppressor circuit)
Switching Capacity (auxiliary contacts)	L54, L84: max. 50mA
Application Category	AC 15 / DC 13 : EN 60947-5-1
Pick-up Delay	≤ 200 ms
Drop-out Delay	≤ 20 ms
Contact Type & Material	AgSnO, self-cleaning, positive-guided & AgNi, self cleaning, positive-guided
Contact Resistance	100 mOhm (max. in new state)
Air Clearance & Creepage Distance	DIN VDE 0110-1, 4 kV/2
Cable Connections	• Self-lifting screw terminals for 13 to 20 AWG • Stranded or multi-core with wire end ferrule
Terminal Labeling	DIN EN 50 005 / DIN 50 013
Muting Lamps	LA1 / LA2: 24V / 50mA-500mA

NOTE: Use of muting lamps is a requirement in Europe. Should muting lamps not be used, an equivalent resistance of approximately 220 ohms (3 watts) is necessary. A version without this lamp monitoring circuit will be available in the near future.

Terminal Connections (shown with dry-input contacts)

Supply Voltage: A1, A2	Monitored Input 1-3: S11, S12	Monitored Input 2-4: S22, S23	Safety Output #1* (N.O.): 13, 14
Safety Output #2* (N.O.): 23, 24	Muting Lamps: LA1, LA2	Feedback Monitoring: X1, X2	Manual (leading-edge) Reset: X1, MR
Auxiliary Output #1: L54 (Simultaneity)	Auxiliary Output #2: L84 (Lamp Current)		

* Safety outputs connected to master controller

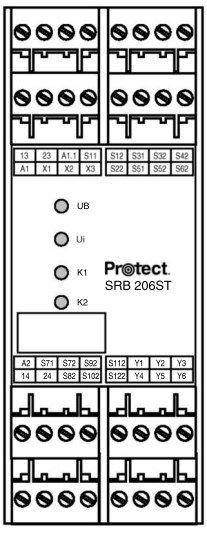
SERIES SRB 206 ST & SRB 206 SQ

General Purpose Safety Controllers (for dry contact input monitoring)

Description

The Model SRB 206 ST/SQ family are “general purpose” units designed for use with safety devices having Normally-Closed (N.C.) dry contacts. Each is equipped for connection with up to six input devices such as E-stop push button and safety interlock switches. In addition it features user-selectable monitored-manual or automatic reset, six (non-safety) semiconductor outputs for signalling/annunciation, and two safety outputs. SRB 206 SQ and SRB 206 SQ-230 also feature cross-short recognition.

Front View



TECHNICAL FEATURES

Input Voltage **SRB 206 ST (SQ)** **SRB 206 ST (SQ) - 230 V**	 24 VAC / DC 48 - 230 V AC
# Discrete Input Devices Monitored	6 (Single or Dual-Channel)
Compatible Input Device Contact Configuration	N.C. (Dry Contacts)
Number & Type Safety Outputs	2 N.O. (Dry Contacts)
Number & Type Auxiliary (Non-Safety or Signalling Outputs)	6 - short circuit proof, PNP-type semiconductor Y1 - Y6 max 20mA
Typical Input Devices Monitored	• E-stops (N.C.) • Interlock switches (N.C.)
Type of Reset (Selectable)	• Monitored-manual (24 VDC trailing edge) • Automatic
Feedback Monitoring	Yes
LED Displays	Green LEDs for: • K1 (safety relay 1) • K2 (safety relay 2) • Ui (voltage beyond internal fuse) • U_B (voltage at input terminals)
Conformity to Standards	UL, CSA, BG (CE-compliant)
Stop Category	0
Safety Classification	PL_d, per EN ISO 13849-1 Category 3, per EN 954-1
Selected Features	• Plug-in screw terminals • Cross-short recognition (SRB 206 SQ models only) • Up to 6 monitored devices • Six auxiliary outputs • Selectable monitored-manual or automatic reset

AVAILABLE MODELS

Model Number	Operating Input Voltage
SRB 206 ST	24V AC/DC
SRB 206 ST - 230V	48 - 230 VAC
SRB 206 SQ*	24V AC/DC
SRB 206 SQ-230*	48 - 230 VAC

*Feature cross-short recognition.

SERIES SRB 206 ST & SRB 206 SQ

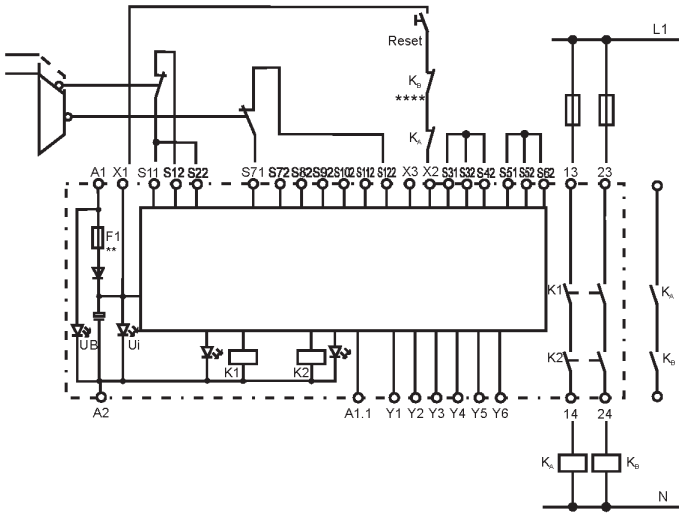
MECHANICAL SPECIFICATIONS

Dimensions (W x H x D)	45mm x 100mm x 121mm (1.77" x 3.9" x 4.75")
Ambient Operating Temperature Range	-25°C to +45°C (-13°F to +113°F)
Mechanical Life Expectancy	>10^7 switching cycles
Weight	300 gm
Mounting	DIN rail

ELECTRICAL SPECIFICATIONS

Operating Voltage	24 VDC -15% / +20%, residual ripple max. 10% 24 VAC -15% / +10%, 50/60 Hz 48 VAC-240VAC, 50/60 Hz
Power Consumption	3.6 W (max.), 3.6 VA
Fuse (Input Power)	
24 V	Internal electronic (hybrid) Fuse F1, Tripping current > 1 A (Resets after interruption of supply voltage)
230 V	Primary : Fuse (glass), tripping current > 1.0 A Secondary : Internal electronic fuse, tripping current > 0.12 A
Fuse (Safety Outputs)	6 A Slow-blow (Recommended)
Switching Capacity (Auxiliary Contacts)	24 VDC, 20 mA
Switching Capacity (Safety Outputs)	230 VAC, 6 A Resistive (inductive with suitable supressor circuit)
Application Category	AC 15 / DC 13 : EN 60 947-5-1
Pick-up Delay	≤ 200 ms
Drop-out Delay	≤ 40 ms
Contact Type & Materials	AgCdO, self cleaning, positive-guided
Contact Resistance	100 mOhm (max. in new state)
Air Clearance & Creepage Distance	DIN VDE 0110-1 (04.97), 4 kV/2
Cable Connections	• Self-lifting, plug-in screw terminals for 13 to 20 AWG • Stranded or multi-core with wire end ferrule
Terminal Labeling	DIN EN 50 005 / DIN 50 013

TYPICAL WIRING DIAGRAM (shown with 1 input)



TERMINAL CONNECTIONS (Model SRB 206 ST shown)

Supply Voltage: A1 A2

Monitored Input #1A: S11 S12

Monitored Input #1B: S71 S72

Monitored Input #2A: S11 S22

Monitored Input #2B: S72 S82

Monitored Input #3A: S31 S32

Monitored Input #3B: S82 S92

Monitored Input #4A: S31 S42

Monitored Input #4B: S92 S102

Monitored Input #5A: S51 S52

Monitored Input #5B: S102 S112

Monitored Input #6A: S51 S62

Monitored Input #6B: S112 S122

Safety Output #1 (N.O.): 13 14

Safety Output #2 (N.O.): 23 24

Feedback Monitoring with Monitored-manual Reset: X1 X2

Feedback Monitoring with Automatic Reset: X1 X3

PNP-Semiconductor Outputs #1 through #6: Y1 Y2 Y3 Y4 Y5 Y6

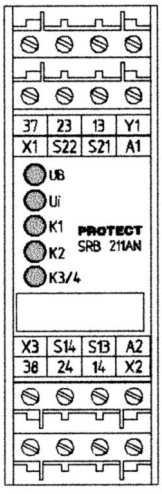
SERIES SRB 211 AN

General Purpose Safety Controller (for dry 1 NO/1 NC contact input monitoring)

Description

The Model SRB 211 AN is a “general purpose” unit designed for use with safety devices having Normally-Open and Normally-Closed dry contact switching outputs. It is equipped for connection of one monitored input device in dual-channel configuration. In addition it features user-selectable monitored-manual or automatic reset, stop category 0 & 1 safety outputs, and feedback monitoring of positive-guided controlled loads.

Front View



TECHNICAL FEATURES

Input Voltage	24 V AC/DC
# Discrete Input Devices Monitored	1 (Dual-Channel)
Compatible Input Device Contact Configuration	N.O./N.C (Dry Contacts)
Number & Type Safety Outputs	3 N.O. (1 delayed : 1-30 sec.) (dry contacts)
Number & Type Auxiliary (Non-Safety or Signalling Outputs)	PNP
Typical Input Devices Monitored	• E-stops (N.C./N.O.) • Interlock switches (N.C./N.O.) • Coded magnets
Type of Reset (Selectable)	• Monitored-manual (24 VDC trailing edge) • Automatic
Feedback Monitoring	Yes
LED Displays	Green LEDs for: • K1 (safety relay 1) • K2 (safety relay 2) • K3/4 (safety relay 3 & 4) • Ui (voltage beyond internal fuse) • U_B (voltage at input terminals)
Conformity to Standards	UL, CSA, BG (CE-compliant)
Stop Category	0 (2 safety outputs) 1 (1 safety output)
Safety Classification	PL_e, per EN ISO 13849-1 Category 4, per EN 954-1
Selected Features	• Plug-in screw terminals • Cross-short recognition • Stop category 0 & 1 safety outputs • Selectable trailing edge or automatic reset • Resetable electronic fuse • Feedback monitoring

AVAILABLE MODELS

Model Number	Operating Voltage
SRB 211 AN	24 V AC/DC

MECHANICAL SPECIFICATIONS

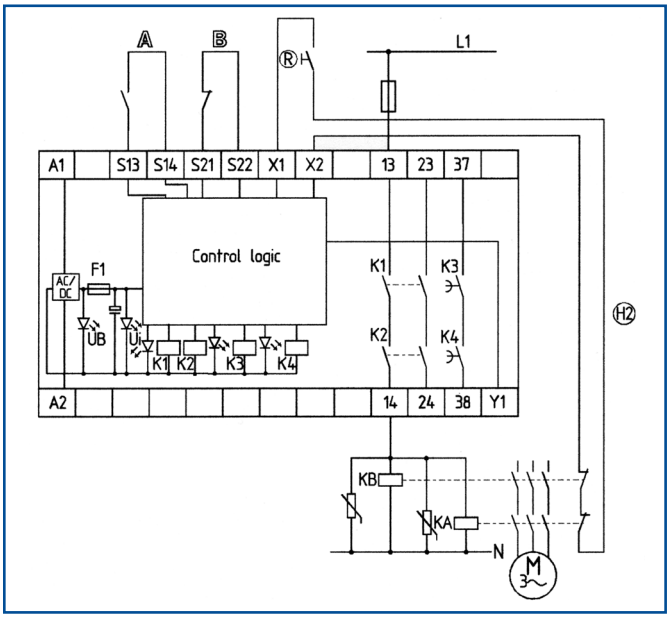
Dimensions (W x H x D)	22.5mm x 100mm x 121mm (0.9" x 3.9" x 4.75")
Ambient Operating Temperature Range	-25°C to +45°C (-13°F to +113°F)
Mechanical Life Expectancy	>10^7 switching cycles
Weight	255 gm
Mounting	DIN rail

ELECTRICAL SPECIFICATIONS

Operating Voltage	24 VDC -15% / +20%, residual ripple max. 10% 24 VAC -15% / +10%, 50/60 Hz
Power Consumption	5.2 W, 7.2 VA (max.), plus signaling output Y1
Fuse (Input Power)	Internal electronic Fuse F1, Tripping current > 1.5 A (Resets approx. 1 second)
Fuse (Safety Outputs)	4 A Slow-blow (Recommended)
Switching Capacity (Safety Outputs)	230 VAC, 4 A Resistive (inductive with suitable suppressor circuit)
Switching Capacity (Auxiliary Contacts)	24 VDC 100mA
Application Category	AC 15 / DC 13 : EN 60 947-5-1
Pick-up Delay	≤ 40 ms
Drop-out Delay	≤ 50 ms
Contact Type & Materials	AgSnOAgNi, self cleaning, positive-guided
Contact Resistance	100 mOhm (max. in new state)
Air Clearance & Creepage Distance	DIN VDE 0110-1 (04.97), 4 kV/2
Cable Connections	• Plug-in, self-lifting, screw terminals for 13 to 20 AWG • Stranded or multi-core with wire end ferrule
Terminal Labeling	DIN EN 50 005 / DIN 50 013

10

TYPICAL WIRING DIAGRAM



TERMINAL CONNECTIONS

Supply Voltage: A1, A2

Monitored Input #1 (N.O.): S13, S14

Monitored Input #2 (N.C.): S21, S22

Safety Output #1 (N.O.): 13, 14

Safety Output #2 (N.O.): 23, 24

Safety Output #3 (Stop Category 1, N.O.): 37, 38

Feedback Monitoring with Automatic Reset: X1, X3

Feedback Monitoring with Manually-Monitored (Trailing Edge) Reset: X1, X2

Auxiliary Output (PNP-Semiconductor): Y1

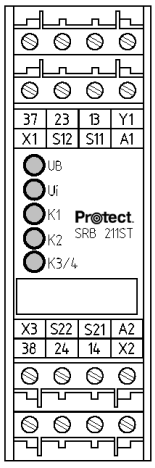
SERIES SRB 211 ST

General Purpose Safety Controller (for dry contact and PNP-type input monitoring)

Description

The Model SRB 211 ST is a “general purpose” unit designed for use with safety devices having Normally-Closed (N.C.) dry contacts or PNP-type switching outputs. It is equipped for connection of one monitored input device in single- or dual-channel configuration. In addition it features user-selectable monitored-manual or automatic reset, stop category 0 & 1 safety outputs, and feedback monitoring of positive-guided controlled loads.

Front View



TECHNICAL FEATURES

Input Voltage	24 V AC/DC
# Discrete Input Devices Monitored	1 (Single or Dual-Channel)
Compatible Input Device Contact Configuration	N.C. (Dry Contacts) or PNP-switching
Number & Type Safety Outputs	3 N.O. (1 delayed: 1-30 sec.) (dry contacts)
Number & Type Auxiliary (Non-Safety or Signalling Output)	PNP
Typical Input Devices Monitored	• E-stops (N.C.) • Interlock switches (N.C.) • Devices with PNP semi-conductor outputs • Coded magnets
Type of Reset (Selectable)	• Monitored-manual (24 VDC trailing edge) • Automatic
Feedback Monitoring	Yes
LED Displays	Green LEDs for: • K1 (safety relay 1) • K2 (safety relay 2) • K3/4 (safety relay 3 & 4) • Ui (voltage beyond internal fuse) • U_B (voltage at input terminals)
Conformity to Standards	UL, CSA, BG (CE-compliant)
Stop Category	0 (2 safety outputs) 1 (1 safety output)
Safety Classification	PL_e, per EN ISO 13849-1 Category 4, per EN 954-1
Selected Features	• Plug-in screw terminals • Cross-short recognition • Stop category 0 & 1 safety outputs • Selectable monitored-manual or automatic reset • Hybrid fuse • Feedback monitoring

AVAILABLE MODELS

Model Number	Operating Voltage
SRB 211 ST	24V AC/DC

SERIES SRB 211 ST

MECHANICAL SPECIFICATIONS

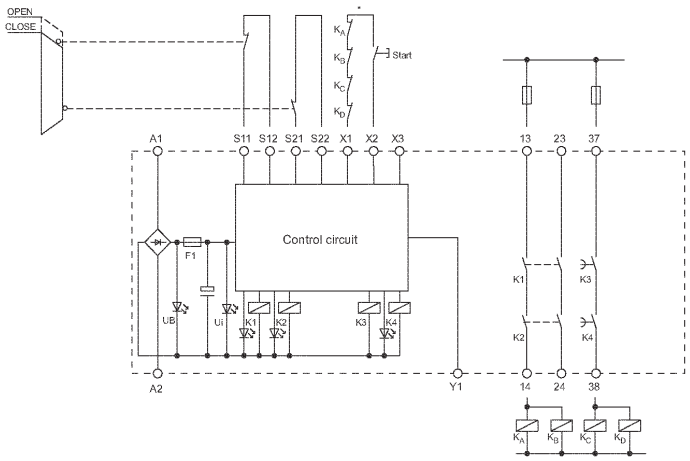
Dimensions (W x H x D)	22.5mm x 100mm x 121mm (0.9" x 3.9" x 4.75")
Ambient Operating Temperature Range	-25°C to +45°C (-13°F to +113°F)
Mechanical Life Expectancy	>10^7 switching cycles
Weight	255 gm
Mounting	DIN rail

ELECTRICAL SPECIFICATIONS

Operating Voltage	24 VDC -15% / +20%, residual ripple max. 10% 24 VAC -15% / +10%, 50/60 Hz
Power Consumption	5.1 W, 5.7 VA (max.), plus signaling output Y1
Fuse (Input Power)	Internal electronic (hybrid) Fuse F1, Tripping current > 1 A (Resets after interruption of supply voltage)
Fuse (Safety Outputs)	4 A Slow-blow (Recommended)
Switching Capacity (Safety Outputs)	230 VAC, 4 A Resistive (inductive with suitable suppressor circuit)
Switching Capacity (Auxiliary Contacts)	24 VDC 100mA
Application Category	AC 15 / DC 13 : EN 60 947-5-1
Pick-up Delay	≤ 40 ms
Drop-out Delay	≤ 40 ms
Contact Type & Materials	AgSnO, self cleaning, positive-guided
Contact Resistance	100 mOhm (max. in new state)
Air Clearance & Creepage Distance	DIN VDE 0110-1 (04.97), 4 kV/2
Cable Connections	• Plug-in, self-lifting, screw terminals for 13 to 20 AWG • Stranded or multi-core with wire end ferrule
Terminal Labeling	DIN EN 50 005 / DIN 50 013

10

Typical Wiring Diagram



Terminal Connections

Supply Voltage: A1, A2

Monitored Input #1 (N.C. or PNP): S11, S12

Monitored Input #2 (N.C. or PNP): S21, S22

Safety Output #1 (N.O.): 13, 14

Safety Output #2 (N.O.): 23, 24

Safety Output #3 (Stop Category 1, N.O.): 37, 38

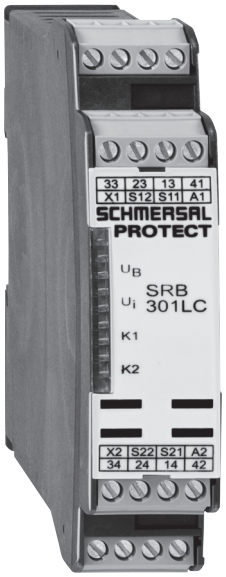
Feedback Monitoring with Automatic Reset: X1, X3

Feedback Monitoring with Monitored-manual Reset: X1, X2

Auxiliary Output (PNP-Semiconductor): Y1

SERIES SRB 301 LC & SRB 301 LCI

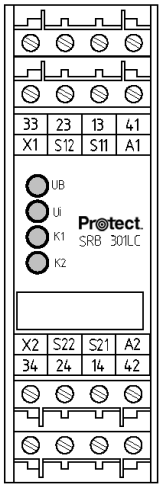
General Purpose Safety Controller (for dry contact and PNP-type input monitoring)



Description

The Model SRB 301 LC is a lower cost “general-purpose” unit designed for use with safety devices having Normally-Closed (N.C.) or PNP-type switching outputs. It is equipped for connection of one input device in single- or dual-channel configuration. In addition it features feedback monitoring of positive-guided controlled loads, automatic or manual reset and optional cross-short recognition.

Front View



TECHNICAL FEATURES

Input Voltage	24 V AC/DC
# Discrete Input Devices Monitored	1 (Single or Dual-Channel)
Monitored Contact Configuration	N.C. (Dry Contacts) or PNP-switching
Number & Type Safety Outputs	3 N.O. (Dry Contacts)
Number & Type Auxiliary (Non-Safety or Signalling Output)	1 N.C. (Dry Contacts)
Typical Input Devices Monitored	• E-stops (N.C.) • Interlock switches (N.C.) • Devices with PNP semi-conductor outputs
Type of Reset (Selectable)	• Manual (24 V Leading Edge) • Automatic
Feedback Monitoring	Yes
LED Displays	Green LEDs for: • K1 (safety relay 1) • K2 (safety relay 2) • Ui (voltage beyond internal fuse) • U_B (voltage at input terminals)
Conformity to Standards	UL, CSA, BG (CE-compliant)
Stop Category	0
Safety Classification	PL_e, per EN ISO 13849-1 Category 4, per EN 954-1
Selected Features	• Cross-short recognition (Field-wired option) • Screw terminals (LC) • Detachable terminals (LCI) • Feedback monitoring • Electronic fuse (LCI) • Glass fuse (LC)

AVAILABLE MODELS

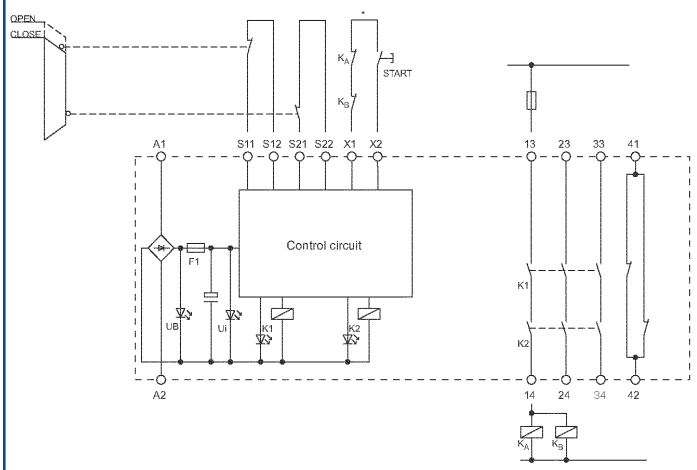
Model Number	Operating Voltage
SRB 301 LC	24V AC/DC
SRB 301 LCI	24V AC/DC

SERIES SRB 301 LC & SRB 301 LCI

MECHANICAL SPECIFICATIONS

Dimensions (W x H x D)	22.5mm x 100mm x 121mm (0.9" x 3.9" x 4.75")
Ambient Operating Temperature Range	-25°C to +45°C (-13°F to +113°F)
Mechanical Life Expectancy	>10^7 switching cycles
Weight	230 gm (0.5 lbs.)
Mounting	DIN rail (35mm)

TYPICAL WIRING DIAGRAM

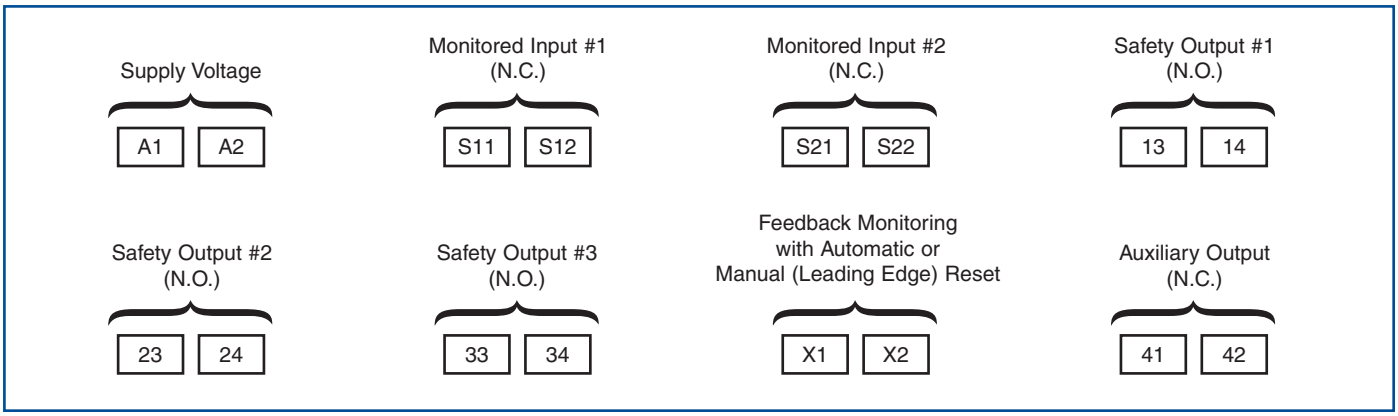


ELECTRICAL SPECIFICATIONS

Operating Voltage	24 VDC -15% / +20%, residual ripple max. 10% 24 VAC -15% / +10%, 50/60 Hz
Power Consumption	1.7 W (max.), 1.9 VA
Fuse (Input Power)	• Internal glass fuse F1: T 0.50 A (SRB 301 LC) • Internal electronic fuse* (SRB 301 LCI)
Fuse (Safety Outputs)	6 A Slow-blow (Recommended)
Switching Capacity (Safety Outputs)	230 VAC, 6 A Resistive (inductive with suitable supressor circuit)
Switching Capacity (Auxiliary Contacts)	24 VDC, 2 A
Application Category	AC 15 / DC 13, EN 60 947-5-1
Pick-up Delay	≤ 30 ms
Drop-out Delay	≤ 50 ms
Contact Type & Materials	AgSnO, self cleaning, positive-guided
Contact Resistance	100 mOhm (max. in new state)
Air Clearance & Creepage Distance	DIN VDE 0110-1 (04.97), 4 kV/2
Cable Connections	• Self-lifting, screw terminals for 13 to 20 AWG • Stranded or multi-core with wire end ferrule
Terminal Labeling	DIN EN 50 005 / DIN 50 013

*Resets automatically after a short time-delay.

TERMINAL CONNECTIONS



SERIES SRB 301 LC/B

Description

The Model SRB 301 LC/B is a lower cost “general-purpose” unit designed for use with safety devices having Normally-Closed (N.C.) or PNP-type switching outputs. It is equipped for connection of one input device in single- or dual-channel configuration. In addition it features feedback monitoring of positive-guided controlled loads, automatic or manual reset and optional cross-short recognition.

TECHNICAL FEATURES

Input Voltage	24 V AC/DC
# Discrete Input Devices Monitored	1 (Single or Dual channel)
Monitored Contact Configuration	N.C. (Dry Contacts) or PNP-switching
Number & Type Safety Outputs	3 N.O. (Dry Contacts)
Number & Type Auxilliary (Non-Safety or Signalling Output)	1 N.C. (Dry Contacts)
Typical Input Devices Monitored	• E-stops (N.C.) • Interlock switches (N.C.) • Coded Magnets • Devices with PNP semi-conductor outputs
Type of Reset (Selectable)	• Manual (24 V Leading Edge) • Automatic
Feedback Monitoring	Yes
LED Displays	Green LEDs for: • K1 (safety relay 1) • K2 (safety relay 2) • Ui (voltage beyond internal fuse) • U_B (voltage at input terminals)
Conformity to Standards	UL, CSA, BG (CE-compliant)
Stop Category	0
Safety Classification	Up to PL_e, per EN ISO 13849-1 Up to Category 4, per EN 954-1

AVAILABLE MODELS

Model Number	Operating Voltage
SRB 301 LC/B	24V AC/DC

SERIES SRB 301 LC/B

MECHANICAL SPECIFICATIONS

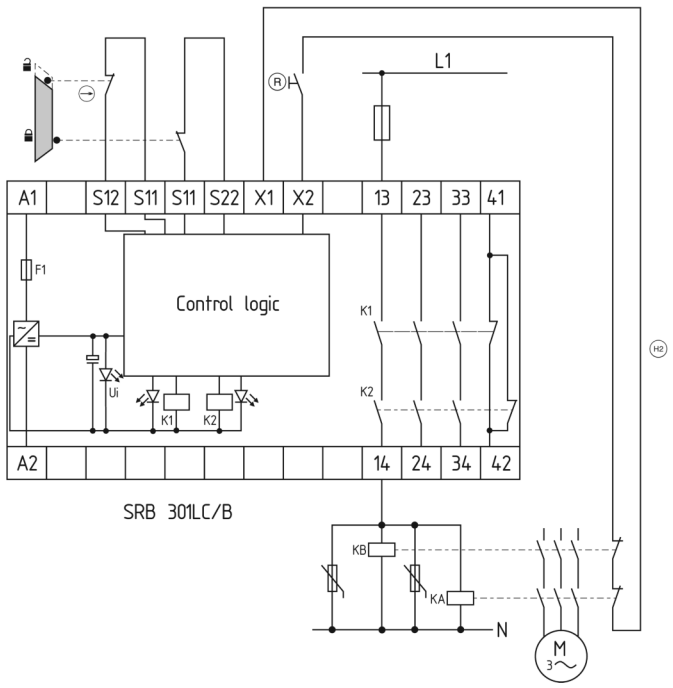
Dimensions (W x H x D)	22.5mm x 100mm x 121mm (0.9" x 3.9" x 4.75")
Ambient Operating Temperature Range	-25°C to +45°C (-13°F to +113°F)
Mechanical Life Expectancy	>10^7 switching cycles
Weight	230 gm (0.5 lbs.)
Mounting	DIN rail (35mm)

ELECTRICAL SPECIFICATIONS

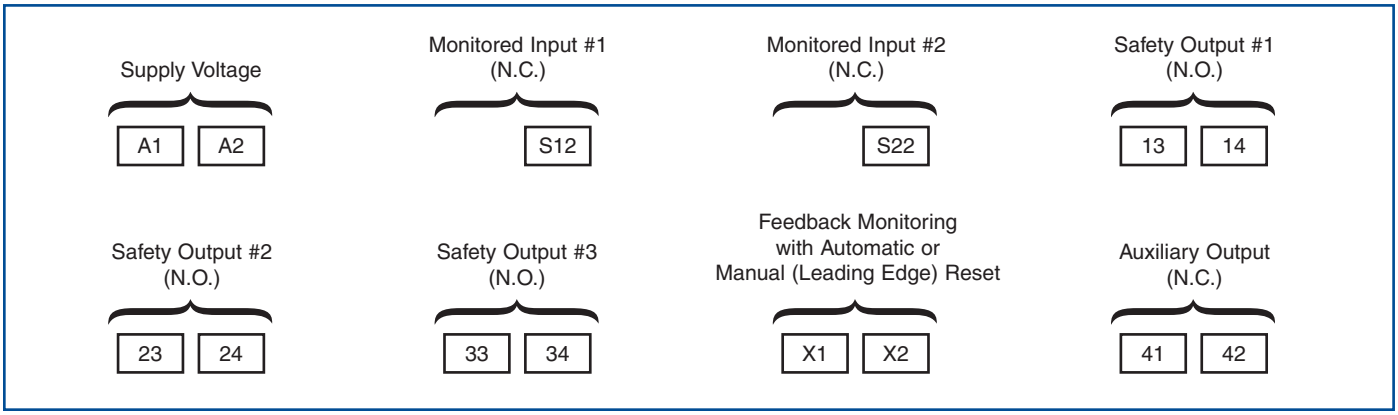
Operating Voltage	24 VDC -15% / +20%, residual ripple max. 10% 24 VAC -15% / +10%, 50/60 Hz
Power Consumption	1.7 W (max.), 1.9 VA
Fuse (Input Power)	Internal glass fuse F1: T 0.25 A
Fuse (Safety Outputs)	6 A Slow-blow (Recommended)
Switching Capacity (Safety Outputs)	230 VAC, 6 A Resistive (inductive with suitable supressor circuit)
Switching Capacity (Auxilliary Contacts)	24 VDC, 2 A
Application Category	AC 15 / DC 13, EN 60 947-5-1
Pick-up Delay	≤ 30 ms
Drop-out Delay	≤ 50 ms
Contact Type & Materials	AgSnO, self cleaning, positive-guided
Contact Resistance	100 mOhm (max. in new state)
Air Cleaner & Creepage Distance	DIN VDE 0110-1 (04.97), 4 kV/2
Cable Connections	• Screw terminals for 13 to 20 AWG • Stranded or multi-core with wire end ferrule
Terminal Labeling	DIN EN 50 005 / DIN 50 013

10

TYPICAL WIRING DIAGRAM



Terminal Connections



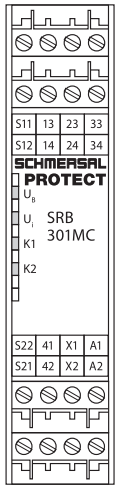
SERIES SRB 301 MC

General Purpose Safety Controller (for dry contact and PNP-type input monitoring)

Description

The Model SRB 301 MC is a “general-purpose” unit designed for use with safety devices having Normally-Closed (N.C.) or PNP-type switching outputs. It is equipped for connection of one input device in single- or dual-channel configuration. In addition it features feedback monitoring of positive-guided controlled loads, automatic or manual reset and optional cross-short recognition.

Front View



TECHNICAL FEATURES

Input Voltage	24 V AC/DC
# Discrete Input Devices Monitored	1 (Single or Dual-Channel)
Monitored Contact Configuration	N.C. (Dry Contacts) or PNP-switching
Number & Type Safety Outputs	3 N.O. (Dry Contacts)
Number & Type Auxiliary (Non-Safety or Signalling Output)	1 N.C. (Dry Contacts)
Typical Input Devices Monitored	• E-stops (N.C.) • Interlock switches (N.C.) • Devices with PNP semi-conductor outputs • Coded Magnets
Type of Reset (Selectable)	• Manual (24 V Leading Edge) • Automatic
Feedback Monitoring	Yes
LED Displays	Green LEDs for: • K1 (safety relay 1) • K2 (safety relay 2) • Ui (voltage beyond internal fuse) • U_B (voltage at input terminals)
Conformity to Standards	UL, CSA, BG (CE-compliant)
Stop Category	0
Safety Classification	PL_e, per EN ISO 13849-1 Category 4, per EN 954-1
Selected Features	• Cross-short recognition (Selectable w/dip-switch) • Screw terminals • Feedback monitoring • Electronic fuse

AVAILABLE MODELS

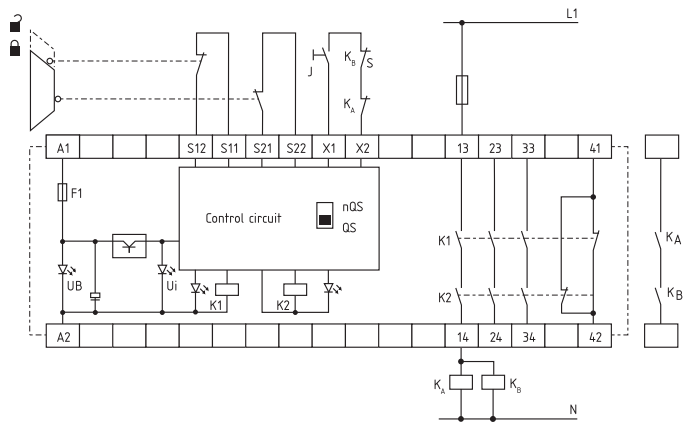
Model Number	Operating Voltage
SRB 301 MC	24V AC/DC

SERIES SRB 301 MC

MECHANICAL SPECIFICATIONS

Dimensions (W x H x D)	22.5mm x 100mm x 121mm (0.9" x 3.9" x 4.75")
Ambient Operating Temperature Range	-25°C to +45°C (-13°F to +113°F)
Mechanical Life Expectancy	>10^7 switching cycles
Weight	230 gm (0.5 lbs.)
Mounting	DIN rail (35mm)

TYPICAL WIRING DIAGRAM



ELECTRICAL SPECIFICATIONS

Operating Voltage	24 VDC -15% / +20%, residual ripple max. 10% 24 VAC -15% / +10%, 50/60 Hz
Power Consumption	2.0 W (max.), 4.9 VA
Fuse (Input Power)	Internal electronic fuse* Tripping current > 0.5 A
Fuse (Safety Outputs)	8 A Slow-blow (Recommended)
Switching Capacity (Safety Outputs)	230 VAC, 8 A Resistive (inductive with suitable supressor circuit)
Switching Capacity (Auxiliary Contacts)	24 VDC, 2 A
Application Category	AC 15 / DC 13, EN 60 947-5-1
Pick-up Delay	≤ 400 ms
Drop-out Delay	≤ 25 ms (emergency stop); ≤ 80 ms (power failure)
Contact Type & Materials	AgSnO, self cleaning, positive-guided
Contact Resistance	100 mOhm (max. in new state)
Air Clearance & Creepage Distance	DIN VDE 0110-1 (04.97), 4 kV/2
Cable Connections	• Self-lifting, screw terminals for 13 to 20 AWG • Stranded or multi-core with wire end ferrule
Terminal Labeling	DIN EN 50 005 / DIN 50 013

*Resets after a 1 second time-delay.

TERMINAL CONNECTIONS

Supply Voltage A1 A2	Monitored Input #1 (N.C.) S11 S12	Monitored Input #2 (N.C.) S21 S22	Safety Output #1 (N.O.) 13 14
Safety Output #2 (N.O.) 23 24	Safety Output #3 (N.O.) 33 34	Feedback Monitoring with Automatic or Manual (Leading Edge) Reset X1 X2	Auxiliary Output (N.C.) 41 42

SERIES SRB 301 ST
SERIES SRB 301 ST - 230V
SERIES SRB 301 SQ - 230V

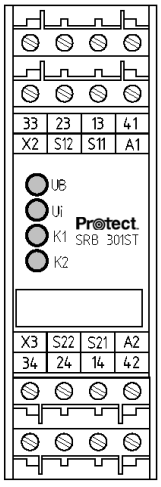
General Purpose Safety Controllers (for dry contact and PNP-type input monitoring)

Model SRB 301 ST shown.

Description

The above "general-purpose" safety controllers are designed for use with safety devices having Normally-Closed (N.C.) or PNP-type switching outputs. Each is equipped for connection of one input device in single- or dual-channel configuration. In addition they feature plug-in screw terminals, user-selectable monitored-manual or automatic reset, feedback monitoring of positive-guided controlled loads and cross-short recognition (on selected models).

Front View



Model SRB 301 ST shown.

TECHNICAL FEATURES

Input Voltage **SRB 301 ST** **SRB 301 ST - 230 V** **SRB 301 SQ - 230 V**	 24 VAC / DC 48 - 230 V AC 48 - 230 V AC
# Discrete Input Devices Monitored	1 (Single or Dual-Channel) (SRB 301 SQ Dual-Channel Only)
Monitored Contact Configuration	N.C. (Dry Contacts) PNP-switching
Number & Type Safety Outputs	3 N.O. (Dry Contacts)
Number & Type Auxiliary (Non-Safety or Signalling Output)	1 N.C. (Dry Contacts)
Typical Input Devices Monitored	• E-stops (N.C.) • Interlock switches (N.C.) • Devices with PNP semiconductor outputs (SRB 301 ST-24V only) • Coded Magnets (SRB 301 ST-24V only)
Type of Reset (Selectable)	• Monitored-manual (24 VDC trailing edge) • Automatic
Feedback Monitoring	Yes
LED Displays	Green LEDs for: • K1 (safety relay 1) • K2 (safety relay 2) • Ui (voltage beyond internal fuse) • U_B (voltage at input terminals, SRB 301 ST only)
Conformity to Standards	UL, CSA, BG (CE-compliant)
Stop Category	0
Safety Classification	PL_e, per EN ISO 13849-1 Category 4, per EN 954-1
Type Fuse	Hybrid
Selected Features	• Cross-short recognition (SRB 301ST 24 VAC / DC & SRB 301 SQ only) • Plug-in screw terminals • Selectable monitored-manual or automatic reset • Feedback monitoring

AVAILABLE MODELS

Model Number	Operating Voltage
SRB 301 ST*	24V AC/DC
SRB 301 ST - 230 V	48-230VAC
SRB 301 SQ - 230 V*	48-230VAC

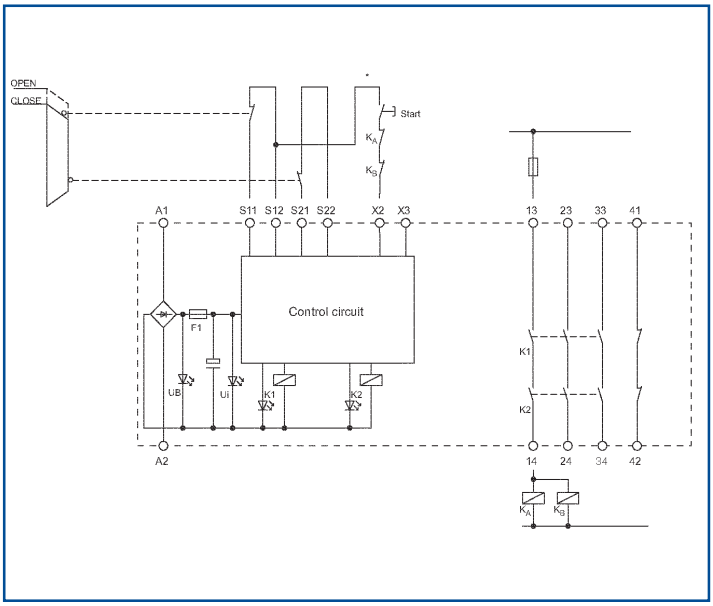
*Feature cross-short recognition.

SERIES SRB 301 ST
SERIES SRB 301 ST - 230V
SERIES SRB 301 SQ - 230V

MECHANICAL SPECIFICATIONS

Dimensions (W x H x D)	22.5mm x 100mm x 121mm (0.9" x 3.9" x 4.75")
Ambient Operating Temperature Range	-25°C to +45°C (-13°F to +113°F)
Mechanical Life Expectancy	>10^7 switching cycles
Weight **SRB 301 ST** **SRB 301 ST - 230V**	 240 gm (0.5 lbs.) 250 gm
Mounting	DIN rail (35mm)

TYPICAL WIRING DIAGRAM



ELECTRICAL SPECIFICATIONS

Operating Voltage **SRB 301 ST** **SRB 301 ST (SQ) - 230V**	 24 VDC -15% / +20%, residual ripple max. 10% 24 VAC -15% / +10%, 50/60 Hz 48 VAC - 240 VAC, 50/60 Hz
Power Consumption **SRB 301 ST** **SRB 301 ST (SQ) - 230V**	 2.4 W (max.), 3.8 VA 2.8 VA
Fuse (Input Power) **24 V** **230 V**	 Internal electronic (hybrid) Fuse F1, Tripping current > 0.6 A (Resets after interruption of supply voltage) F1 : glass bulb, tripping current 0.5 A Secondary : electronic fuse, tripping current 0.12 A
Fuse (Safety Outputs)	6 A Slow-blow (Recommended)
Switching Capacity (Safety Outputs)	230 VAC, 6 A Resistive (inductive with suitable surge supressor)
Switching Capacity (Auxiliary Contacts)	24 VDC, 2 A
Application Category	AC 15 / DC 13, EN 60 947-5-1
Pick-up Delay **SRB 301 ST** **SRB 301 ST (SQ) - 230V**	 ≤ 200 ms ≤ 30 ms
Drop-out Delay **SRB 301 ST** **SRB 301 ST (SQ) - 230V**	 ≤ 20 ms ≤ 30 ms
Contact Type & Materials	AgSnO, self cleaning, positive-guided
Contact Resistance	100 mOhm (max. in new state)
Air Clearance & Creepage Distance	DIN VDE 0110-1 (04.97), 4 kV/2
Cable Connections	• Self-lifting, plug-in screw terminals for 13 to 20 AWG • Stranded or multi-core with wire end ferrule
Terminal Labeling	DIN EN 50 005 / DIN 50 013

TERMINAL CONNECTIONS (Model SRB 301 ST shown)

Supply Voltage: A1 A2

Monitored Input #1 (N.C.): S11 S12

Monitored Input #2 (N.C.): S21 S22

Safety Output #1 (N.O.): 13 14

Safety Output #2 (N.O.): 23 24

Safety Output #3 (N.O.): 33 34

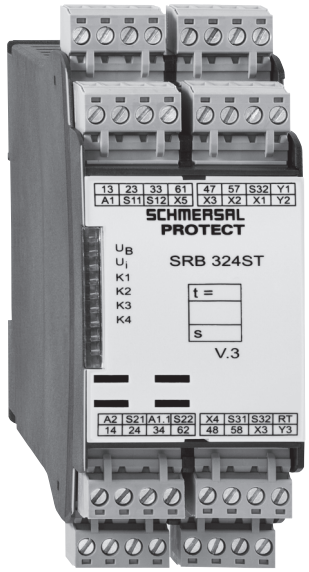
Feedback Monitoring with Automatic Reset: X3 S12

Feedback Monitoring with Monitored-manual Reset: X2 S12

Auxiliary Output (N.C.): 41 42

SERIES SRB 324 ST

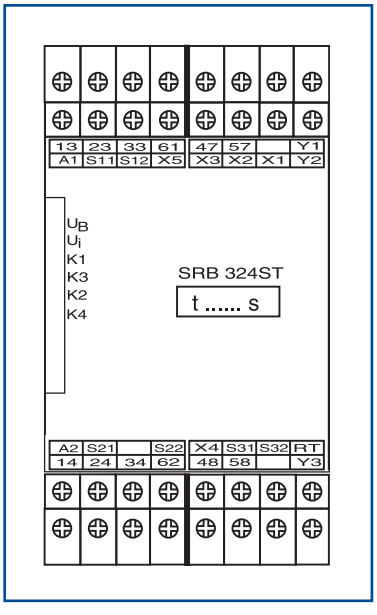
General Purpose Safety Controller (for dry contact & PNP-type input monitoring



Description

The Model SRB 324 ST is a “general purpose” unit designed for use with safety devices having Normally-Closed (N.C.) dry contacts or PNP-type switching outputs. It is equipped for connection of one monitored input device in single- or dual-channel configuration. In addition it features user-selectable monitored-manual or automatic reset, stop category 0 & 1 safety outputs, and feedback monitoring of positive-guided controlled loads.

Front View



TECHNICAL FEATURES

Input Voltage	24V AC/DC
# Discrete Input Devices Monitored	1 (Single or Dual-Channel)
Compatible Input Device Contact Configuration	N.C. (Dry Contacts) or PNP-switching
Number & Type Safety Outputs	5 N.O. (2 delayed: 1-30 sec.) (dry contacts)
Number & Type Auxiliary (Non-Safety or Signalling Outputs)	1 N.C. (dry contact) 3 - PNP
Typical Input Devices Monitored	• E-stops (N.C.) • Interlock switches (N.C.) • Devices with PNP outputs • Coded magnets
Type of Reset (Selectable)	• Monitored-manual (trailing edge) • Automatic
Feedback Monitoring	Yes
LED Displays	Green LEDs for: • K1-K4 (safety relays 1-4) • Ui (voltage beyond internal fuse) • UB (voltage at input terminals)
Conformity to Standards	UL, CSA, BG (CE-compliant)
Stop Category	0 (3 safety outputs) 1 (2 safety outputs)
Safety Classification	PL_e, per EN ISO 13849-1 Category 4, per EN 954-1
Selected Features	• Plug-in screw terminals • Cross-short recognition • Stop category 0 & 1 • Selectable monitored-manual or automatic reset • Hybrid fuse • Feed back monitoring

AVAILABLE MODELS

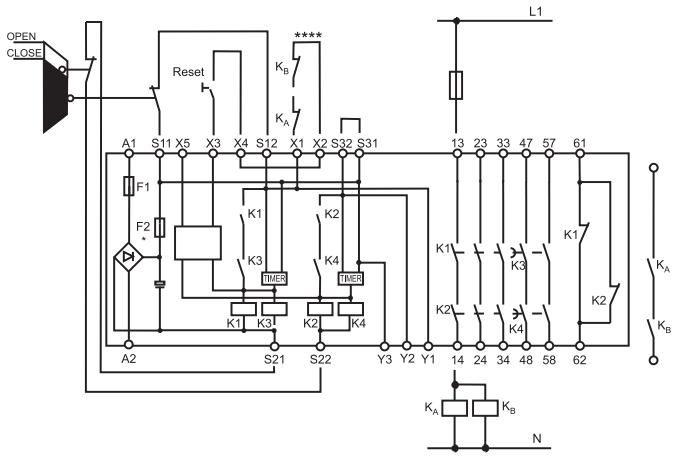
Model Number	Operating Voltage
SRB 324 ST	24 V AC/DC

SERIES SRB 324 ST

MECHANICAL SPECIFICATIONS

Dimensions (W x H x D)	45mm x 100mm x 121mm (1.8" x 3.9" x 4.75")
Ambient Operating Temperature Range	-25°C to +45°C (-13°F to +113°F)
Mechanical Life Expectancy	>10^7 switching cycles
Weight	480 gm
Mounting	DIN rail (35mm)

TYPICAL WIRING DIAGRAM



ELECTRICAL SPECIFICATIONS

Operating Voltage	24 VDC -15% / +20%, residual ripple max. 10% 24 VAC -15% / +10%, 50/60 Hz
Power Consumption	4.8 W, 7.8 VA max. (Plus signalling contacts Y1-Y3)
Fuse (Input Power)	• Internal electronic Fuse F1, tripping current > 2.5 A (reset approx. 1 second) • Internal hybrid fuse F2, tripping current > 1.0 A (reset after interruption of supply voltage)
Fuse (Safety Outputs)	6 A Slow-blow (Recommended)
Switching Capacity (Safety Outputs Stop 0)	230 VAC, 6 A Resistive (inductive with suitable supressor circuit)
Switching Capacity (Auxiliary Contacts)	Y1-Y3: 24 VDC, 100mA (PNP) 61/62: 24 VDC, 2 A max. (Dry)
Application Category	AC-15 / DC-13 : EN 60 947-5-1
Pick-up Delay	≤ 30 ms
Drop-out Delay	≤ 30 ms (13/14, 23/24, 33/34)
Contact Type & Material	AgSnO, self cleaning, positive-guided
Contact Resistance	100 mOhm (max. in new state)
Air Clearance & Creepage Distance	DIN VDE 0110-1 (04.97), 4 kV/2
Cable Connections	• Plug-in, self-lifting, screw terminals for 13 to 20 AWG • Stranded or multi-core with wire end ferrule
Terminal Labeling	DIN EN 50 005 / DIN 50 013

10

TERMINAL CONNECTIONS

Supply Voltage: A1 A2

Monitored Input #1: S11 S12

Monitored Input #2: S21 S22

Safety Output #1 (NO): 13 14

Safety Output #2 (NO): 23 24

Safety Output #3 (NO): 33 34

Safety Output #4 Stop Category 1 (NO): 47 48

Safety Output #5 Stop Category 1 (NO): 57 58

Feedback Monitoring: X1 X2

Monitored-Manual Reset: X3 X4

Automatic Reset: X4 X5

Jumper: S31 S32

Auxiliary PNP Output: Y1 Y2 Y3

SERIES SRB 202 C & SRB 400 C

Differentiated-Input Controllers

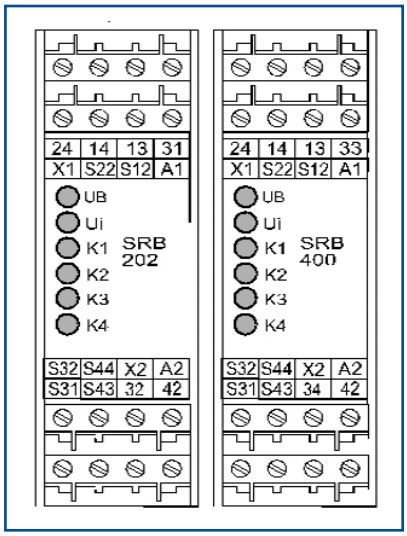
Description

The Series SRB202C and SRB400C are (general purpose) units designed for use with safety devices having two Normally-Closed (N.C.) and/or one Normally-Open (N.O.) and one Normally-Closed (N.C.) dry contacts. Uniquely, they provide for differentiated switching of the safety outputs depending on the input that is actuated.

For example, actuating an E-Stop as Input #1 would disable all of the unit's safety outputs. Conversely, actuation of Input #2 (e.g., a safety guard interlock switch) would only disable half of the available safety outputs (safety output #2 on SRB202C units and safety outputs #3 & #4 on SRB400C units).

Thus this functionality, which would normally require two discrete safety controllers, can be achieved with a single unit (controller).

Front View



TECHNICAL FEATURES

Input Voltage	24 VDC
# Discrete Input Devices Monitored	2
Compatible Input Device Contact Configuration	Input #1: 2 N.C. (Dry contacts) Input #2: 2 N.C. or 1 N.O./1 N.C.
Number & Type Safety Outputs	2 N.O. (SRB202 models) 4 N.O. (SRB400 models)
Number & Type Auxiliary (Non-Safety or Signalling Outputs)	SRB202: 2 N.C. SRB400: None
Typical Input Devices Monitored	• E-stops (N.C.) • Interlock switches (N.C.)
Type of Reset (Depends on model)	• Monitored-manual (24 VDC trailing edge) • Automatic or Manual
Feedback Monitoring	Yes
LED Displays	Green LEDs for: • K1 (safety relay 1) • K2 (safety relay 2) • K3 (safety relay 3) • K4 (safety relay 4) • Ui (voltage beyond internal fuse) • U_B (voltage at input terminals)
Conformity to Standards	UL, CSA, BG (CE-compliant)
Stop Category	0
Safety Classification	PL_e, per EN ISO 13849-1 Category 4, per EN 954-1
Selected Features	• Plug-in screw terminals • Cross-short recognition ("Q" models only) • Electronic fuse • Feedback monitoring

Selection Chart

	Outputs		Input #1			Input #2	
Model #	**Safety**	**Aux**	**Contacts**	**Reset**	**Cross-short**	**Contacts**	**Reset**
SRB202CA	2	2	2 N.C.	Auto or Manual	No	1 N.O./1 N.C.*	Auto or Manual
SRB202CS	2	2	2 N.C.		No	2 N.C.	
SRB202CA/Q	2	2	2 N.C.		Yes	1 N.O./1 N.C.*	
SRB202CA/T	2	2	2 N.C.	Monitored-manual	No	1 N.O./1 N.C.*	Auto or Manual
SRB202CS/T	2	2	2 N.C.		No	2 N.C.	
SRB202CA/QT	2	2	2 N.C.		Yes	1 N.O./1 N.C.*	
SRB400CA	4	0	2 N.C.	Auto or Manual	No	1 N.O./1 N.C.*	Auto or Manual
SRB400CS	4	0	2 N.C.		No	2 N.C.	
SRB400CA/Q	4	0	2 N.C.		Yes	1 N.O./1 N.C.*	
SRB400CA/T	4	0	2 N.C.	Monitored-manual	No	1 N.O./1 N.C.*	Auto or Manual
SRB400CS/T	4	0	2 N.C.		No	2 N.C.	
SRB400CA/QT	4	0	2 N.C.		Yes	1 N.O./1 N.C.*	

*Suitable for use with BNS coded-magnet switches.

SERIES SRB 202 C & SRB 400 C

MECHANICAL SPECIFICATIONS

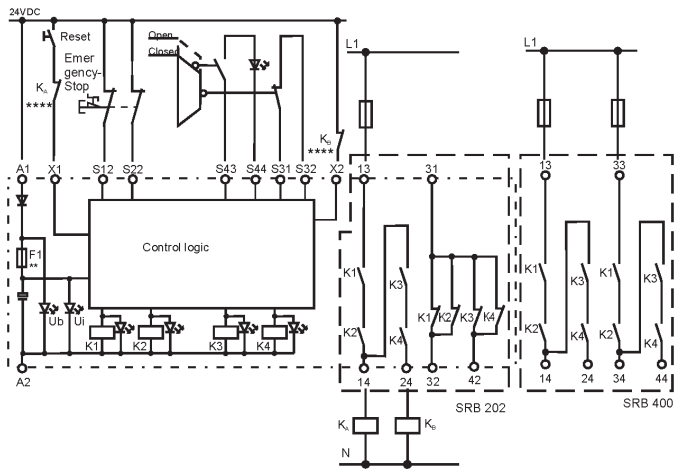
Dimensions (W x H x D)	22.5mm x 100mm x 121mm (0.9" x 3.9" x 4.75")
Ambient Operating Temperature Range	-25°C to +45°C (-13°F to +113°F)
Mechanical Life Expectancy	$>10^7$ switching cycles
Weight	235 gm
Mounting	DIN rail (35mm)

ELECTRICAL SPECIFICATIONS

Operating Voltage	24 VDC -15% / +20%, residual ripple max. 10%
Power Consumption	4.4 W
Fuse (Input Power)	Internal electronic fuse* F1, Tripping current > 1 A
Fuse (Safety Outputs)	6 A Slow-blow (Recommended)
Switching Capacity (Safety Outputs)	230 VAC, 6 A Resistive (inductive with suitable suppressor circuit)
Switching Capacity (Auxiliary Contacts)	24 VDC 100mA
Application Category	AC 15 / DC 13 : EN 60 947-5-1
Pick-up Delay	≤ 40 ms
Drop-out Delay	≤ 50 ms
Contact Type & Materials	AgSnO, self cleaning, positive-guided
Contact Resistance	100 mOhm (max. in new state)
Air Clearance & Creepage Distance	DIN VDE 0110-1 (04.97), 4 kV/2
Cable Connections	• Plug-in, self-lifting, screw terminals for 13 to 20 AWG • Stranded or multi-core with wire end ferrule
Terminal Labeling	DIN EN 50 005 / DIN 50 013

*Resets automatically after a short time-delay.

TYPICAL WIRING DIAGRAM



TERMINAL CONNECTIONS

Input Power: A1, A2	Monitored Input #1A (N.C.): A1, S12	Monitored Input #1B (N.C.): A1, S22	Monitored Input #2A (N.C.): S31, S32
Monitored Input #2B (N.C.): S41, S42	Monitored Input #2B (N.O.)*: S43, S44	Feedback and Reset Input #1: A1, X1	Feedback and Reset Input #2: A1, X2
Output #1: 13, 14	Output #2: 13, 24	Output #3 (SRB400 only): 33, 34	Output #4 (SRB400 only): 33, 44
Auxiliary Output #1 (SRB202 only): 31, 32	Auxiliary Output #2 (SRB202 only): 31, 42		

*For models having 1 N.O./1 N.C. contacts on Input #2.

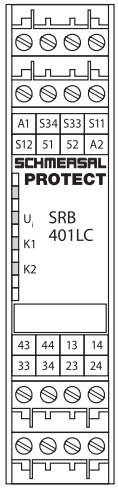
SERIES SRB 401 LC

General Purpose Safety Controller (for dry contact input monitoring)

Description

The Model SRB 401 LC is a lower cost “general-purpose” unit designed for use with safety devices having Normally-Closed (N.C.) switching outputs. It is equipped for connection of one input device in single- or dual-channel configuration. In addition it features feedback monitoring of positive-guided controlled loads, automatic or manual reset and cross-short recognition when monitoring in dual-channel.

Front View



TECHNICAL FEATURES

Input Voltage	24 V AC/DC
# Discrete Input Devices Monitored	1 (Single or Dual-Channel)
Monitored Contact Configuration	N.C. (Dry Contacts)
Number & Type Safety Outputs	4 N.O. (Dry Contacts)
Number & Type Auxiliary (Non-Safety or Signalling Output)	1 N.C. (Dry Contacts)
Typical Input Devices Monitored	• E-stops (N.C.) • Interlock switches (N.C.)
Type of Reset (Selectable)	• Manual (24 V Leading Edge) • Automatic
Feedback Monitoring	Yes
LED Displays	Green LEDs for: • K1 (safety relay 1) • K2 (safety relay 2) • Ui (voltage beyond internal fuse) • U_B (voltage at input terminals)
Conformity to Standards	UL, CSA, BG (CE-compliant)
Stop Category	0
Safety Classification	PL_d, per EN ISO 13849-1 Category 3, per EN 954-1
Selected Features	• Cross-short recognition • Screw terminals • Feedback monitoring • Glass fuse

AVAILABLE MODELS

Model Number	Operating Voltage
SRB 401 LC	24V AC/DC

SERIES SRB 401 LC

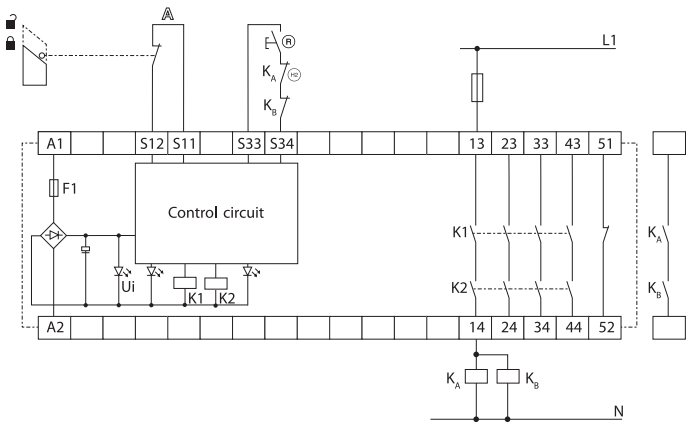
MECHANICAL SPECIFICATIONS

Dimensions (W x H x D)	22.5mm x 100mm x 121mm (0.9" x 3.9" x 4.75")
Ambient Operating Temperature Range	-25°C to +45°C (-13°F to +113°F)
Mechanical Life Expectancy	>10^7 switching cycles
Weight	210 gm (0.47 lbs.)
Mounting	DIN rail (35mm)

ELECTRICAL SPECIFICATIONS

Operating Voltage	24 VDC -15% / +20%, residual ripple max. 10% 24 VAC -15% / +10%, 50/60 Hz
Power Consumption	2.5 W (max.), 4.2 VA
Fuse (Input Power)	Internal glass fuse F1: T 0.25 A
Fuse (Safety Outputs)	6 A Slow-blow (Recommended)
Switching Capacity (Safety Outputs)	230 VAC, 6 A Resistive (inductive with suitable supressor circuit)
Switching Capacity (Auxiliary Contacts)	24 VDC, 2 A
Application Category	AC 15 / DC 13, EN 60 947-5-1
Pick-up Delay	≤ 15 ms
Drop-out Delay	≤ 30 ms
Contact Type & Materials	AgCdO, self cleaning, positive-guided
Contact Resistance	100 mOhm (max. in new state)
Air Clearance & Creepage Distance	DIN VDE 0110-1 (04.97), 4 kV/2
Cable Connections	• Self-lifting, screw terminals for 13 to 20 AWG • Stranded or multi-core with wire end ferrule
Terminal Labeling	DIN EN 50 005 / DIN 50 013

TYPICAL WIRING DIAGRAM



Single-channel configuration shown

TERMINAL CONNECTIONS (Single-channel configuration)

Supply Voltage A1 A2	Monitored Input #1 (N.C.) S11 S12	Safety Output #1 (N.O.) 13 14	Safety Output #2 (N.O.) 23 24
Safety Output #3 (N.O.) 33 34	Safety Output #4 (N.O.) 43 44	Feedback Monitoring with Automatic or Manual (Leading Edge) Reset S33 S34	Auxiliary Output (N.C.) 51 52

SERIES SRB 402 EM & SRB 401 EM-115V

Safety Output Expansion Module

TECHNICAL FEATURES

Input Voltage	SRB 402 EM: 24V AC/DC SRB 401 EM-115V: 115V AC
Number & Type Safety Outputs	4 N.O. (Dry Contacts)
Number & Type Auxiliary (Non-Safety or Signalling Outputs)	SRB 402 EM: 2 N.C. SRB 401 EM-115V: 1 N.C.
LED Displays	Green LEDs for: • K1/K2 (safety relay 1 & 2)
Conformity to Standards	UL, CSA, BG (CE-compliant)
Stop Category	0
Safety Classification	Function of Master Safety Controller (mounted in same control cabinet)
Selected Features	• Plug-in screw terminals • Compatible with all SRB PROTECT℠ Series models

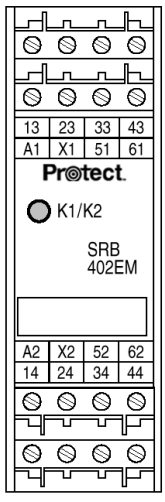
Description

The Models SRB 402 EM and 401 EM are designed for use as an accessory for SCHMERSAL's PROTECT℠ Series safety controllers. It provides additional safety (enabling) outputs where required to satisfy the system control requirements.

AVAILABLE MODELS

Model Number	Operating Voltage
SRB 402 EM	24V AC/DC
SRB 401 EM-115V	115V AC

Front View



Model SRB 402 EM shown

SERIES SRB 402 EM & SRB 401 EM-115V

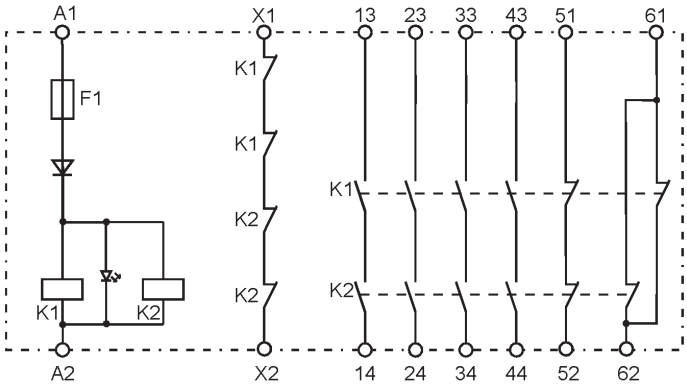
MECHANICAL SPECIFICATIONS

Dimensions (W x H x D)	22.5mm x 100mm x 121mm (0.9" x 3.94" x 4.75")
Ambient Operating Temperature Range	-25°C to +45°C (-13°F to +113°F)
Mechanical Life Expectancy	>10^7 switching cycles
Weight	SRB 402 EM: 215 gm (0.47 lbs.) SRB 401 EM: 260 gm (0.57 lbs.)
Mounting	DIN rail (35mm)

ELECTRICAL SPECIFICATIONS

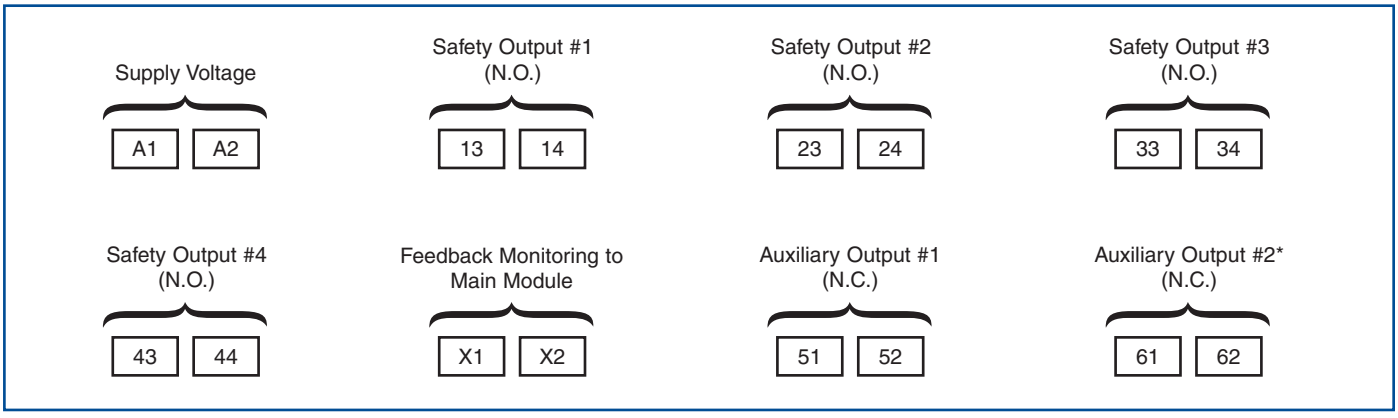
Operating Voltage: **SRB 402 EM** **SRB 401 EM-115V**	 24V DC -15% / +20%, residual ripple max. 10% 24V AC -15% / +10%, 50/60 Hz 115V AC -15% / +6%, 50/60 Hz
Power Consumption	1.0 VA (max.) / 1.0 W (max.)
Fuse (Input Power) (for SRB 402 EM only)	Glass fuse F1: 1.0 A / 250 V (Slow-blow)
Fuse (Safety Outputs)	6 A Slow-blow (Recommended)
Switching Capacity (Safety Outputs)	230V AC, 6 A Resistive (inductive with suitable supressor)
Switching Capacity (Auxiliary Contacts)	24V DC, 2 A
Application Category	AC 15 / DC 13, EN IEC 60947-5-1
Pick-up Delay	≤ 30 ms
Drop-out Delay	≤ 35 ms
Contact Type & Materials	AgSnO, self cleaning, positive-guided
Contact Resistance	100 mOhm (max. in new state)
Air Clearance & Creepage Distance	DIN VDE 0110-1 (04.97), 4 kV/2
Cable Connections	• Self-lifting, screw terminals for 13 to 24 AWG • Stranded or multi-core with wire end ferrule
Terminal Labeling	DIN EN 50 005 / DIN 50 013

TYPICAL WIRING DIAGRAM



Model SRB 402 EM shown

TERMINAL CONNECTIONS



*Featured on SRB 402 EM model only

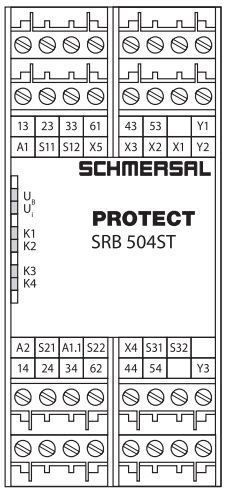
SERIES SRB 504 ST

General Purpose Safety Controller (for dry contact and PNP-type input monitoring)

Description

The above “general-purpose” safety controllers are designed for use with safety devices having Normally-Closed (N.C.) or PNP-type switching outputs. Each is equipped for connection of one input device in single- or dual-channel configuration. In addition they feature plug-in screw terminals, user-selectable monitored-manual or automatic reset, feedback monitoring of positive-guided controlled loads and optional cross-short recognition.

Front View



TECHNICAL FEATURES

Input Voltage	24 VAC / DC
# Discrete Input Devices Monitored	1 (Single or Dual-Channel)
Monitored Contact Configuration	N.C. (Dry Contacts) or PNP-switching
Number & Type Safety Outputs	5 N.O. (Dry Contacts)
Number & Type Auxiliary (Non-Safety or Signalling Output)	1 N.C. (Dry Contacts) & 3-PNP
Typical Input Devices Monitored	• E-stops (N.C.) • Interlock switches (N.C.) • Devices with PNP semiconductor outputs
Type of Reset (Selectable)	• Monitored-manual (24V DC trailing edge) • Automatic
Feedback Monitoring	Yes
LED Displays	Green LEDs for: • K1 (safety relay 1) • K2 (safety relay 2) • K3 (safety relay 3) • K4 (safety relay 4) • Ui (voltage beyond internal fuse) • U_B (voltage at input terminals)
Conformity to Standards	UL, CSA, BG (CE-compliant)
Stop Category	0
Safety Classification	PL_e, per EN ISO 13849-1 Category 4, per EN 954-1
Type Fuse	Hybrid
Selected Features	• Cross-short recognition • Plug-in screw terminals • Selectable trailing edge or automatic reset • Feedback monitoring • Resetable (hybrid) fuse

AVAILABLE MODELS

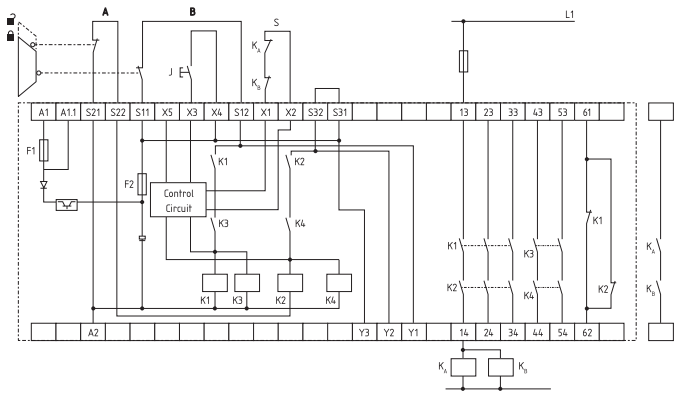
Model Number	Operating Voltage
SRB 504 ST	24V AC/DC

SERIES SRB 504 ST

MECHANICAL SPECIFICATIONS

Dimensions (W x H x D)	45mm x 100mm x 121mm (1.8" x 3.9" x 4.75")
Ambient Operating Temperature Range	-25°C to +60°C (-13°F to +140°F)
Mechanical Life Expectancy	>10^7 switching cycles
Weight	420 gm (0.93 lbs.)
Mounting	DIN rail (35mm)

TYPICAL WIRING DIAGRAM



ELECTRICAL SPECIFICATIONS

Operating Voltage	24V DC -15% / +20%, residual ripple max. 10% 24V AC -15% / +10%, 50/60 Hz
Power Consumption	3.2 W (max.), 7.1 VA, plus signalling outputs
Fuse (Input Power)	Internal electronic Fuse F1, Tripping current > 2.5 A (Resets after interruption of supply voltage)
Fuse (Safety Outputs)	6 A Slow-blow (Recommended)
Switching Capacity (Safety Outputs)	250V AC, 6 A Resistive (inductive with suitable surge supressor)
Switching Capacity (Auxiliary Contacts)	24V DC, 2 A
Application Category	AC 15 / DC 13, EN 60 947-5-1
Pick-up Delay	≤ 400 ms auto start
Drop-out Delay	≤ 30 ms (at emergency stop) ≤ 80 ms (at power failure)
Contact Type & Materials	AgSnO, AgNi self cleaning, positive-guided
Contact Resistance	100 mOhm (max. in new state)
Air Clearance & Creepage Distance	DIN VDE 0110-1 (04.97), 4 kV/2
Cable Connections	• Self-lifting, plug-in screw terminals for 13 to 20 AWG • Stranded or multi-core with wire end ferrule
Terminal Labeling	DIN EN 50 005 / DIN 50 013

TERMINAL CONNECTIONS

Supply Voltage: A1 A2

Monitored Input #1 (N.C.): S11 S12

Monitored Input #2 (N.C.): S21 S22

Safety Output #1 (N.O.): 13 14

Safety Output #2 (N.O.): 23 24

Safety Output #3 (N.O.): 33 34

Safety Output #4 (N.O.): 43 44

Feedback Monitoring: X1 X2

Safety Output #5 (N.O.): 53 54

Manually-monitored (Trailing Edge) Reset: X3 X4

Automatic Reset: X4 X5

Auxiliary Output (N.C.): 61 62

Auxiliary Output (PNP-Semiconductor): Y1 Y2 Y3

Jumpers: S31 S32

SERIES PROTECT-IE

Input Expansion Module

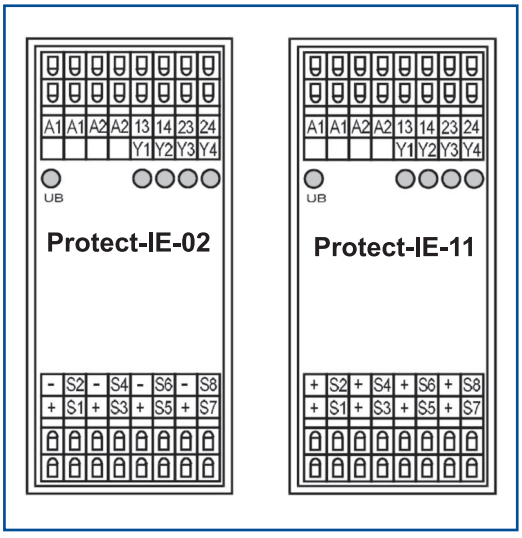
Description

The Protect-IE is designed for use as an accessory for Schmersal's Protect Series Safety Controllers. It provides 4 additional sensor inputs where required to satisfy the system control requirements. Depending on the version, the Protect-IE monitors 1 NO/1NC or 2 NC contacts. It is possible to cascade multiple units to monitor up to 80 sensors.

TECHNICAL FEATURES

Input Voltage	24 VDC
Number & Type of Outputs	2 N.O. (dry contacts) to master safety controller
Number & Type Auxiliary (non-safety or signalling outputs)	4 – 24 VDC (Y1-Y4)
Reset & Feedback Monitoring	Performed by master controller
Typical Input Devices Monitored	• E-stops • Interlocks • Coded-magnets
LED Displays	Green LEDs for: • U_B (voltage at input terminals) • Y1-Y4 (signalling output)
Conformity to Standards	UL, CSA, BG (CE-compliant) (In preparation)
Stop Category	0
Safety Classification	A function of the master safety controller (mounted in same control cabinet), with a maximum of PL_d, per EN ISO 13849-1 Category 3, per EN 954-1
Selected Features	• Cage-clamp terminals • Cross-short recognition • Electronic fuse • Compatible with all SRB Protect Series models with 2 N.C. inputs

Front View



AVAILABLE MODELS

Model Number	Monitoring Configuration of Sensors	Operating Voltage
Protect-IE-02	2 NC	24 VDC
Protect-IE-11	1 NO/1 NC	24 VDC

Note: Screw terminals are also available. Add -SK to the Model Number.

MECHANICAL SPECIFICATIONS

Dimensions (W x H x D)	48mm x 126mm x 61mm (1.89" x 4.96" x 2.4")
Ambient Operating Temperature Range	-25°C to +55°C (-13°F to +131°F)
Mechanical Life Expectancy	>10^7 switching cycles
Weight	140 gm
Mounting	DIN rail

ELECTRICAL SPECIFICATIONS

Operating Voltage	24 VDC -15% / +20%, residual ripple max. 10%
Power Consumption	1.7 W max.; plus Y1-Y4
Fuse (input power)	Internal electronic fuse, tripping current > 100 mA
Fuse (outputs)	2 A slow-blow
Switching Capacity (outputs)	24V, 2 A Resistive (inductive with suitable suppressor)
Switching Capacity (auxiliary contacts)	24 VDC, 100 mA (Y1-Y4)
Pick-up Delay	≤ 20 ms
Drop-out Delay	≤ 20 ms
Contact Resistance	100 mOhm (max. in new state)
Air Clearance & Creepage Distance	DIN VDE 0110-1 (04.97), 4 kV/2
Cable Connections	• Cage-clamp terminals for min. 0.08mm² & max. 2.5mm² • Stranded or multi-core with wire end ferrule
Terminal Labeling	DIN EN 50 005 / DIN 50 013

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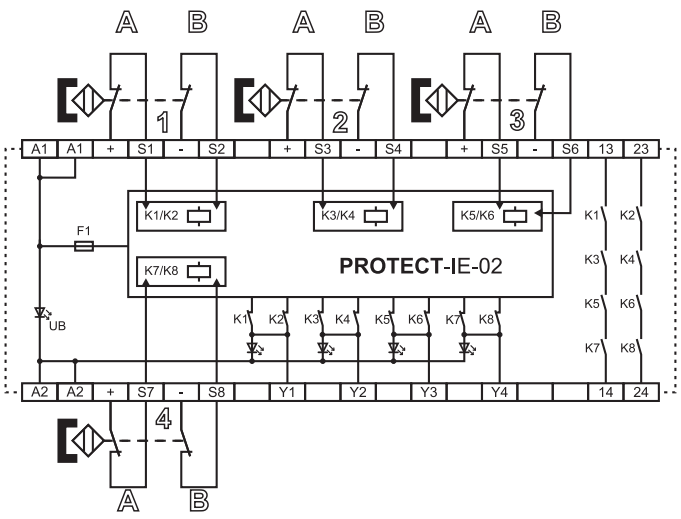
Typical Wiring Diagram (Model Protect-IE-02 shown)

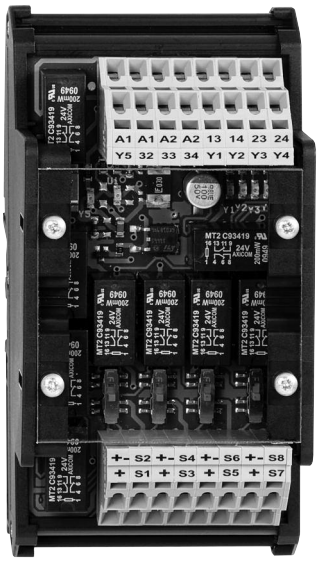


Terminal Connections (Model Protect-IE-02 shown)

Supply Voltage	Output #1 (N.O.)	Output #2 (N.O.)	Signalling Outputs (24 VDC)
A1 A2	13 14	23 24	Y1 Y2 Y3 Y4
Monitored Input #1A (N.C.)	Monitored Input #1B (N.C.)	Monitored Input #2A (N.C.)	Monitored Input #2B (N.C.)
+ S1	– S2	+ S3	– S4
Monitored Input #3A (N.C.)	Monitored Input #3B (N.C.)	Monitored Input #4A (N.C.)	Monitored Input #4B (N.C.)
+ S5	– S6	+ S7	– S8

SERIES PROTECT-PE

Input Expansion Module



Description

The Protect-IE is designed for use as an accessory for Schmersal's Protect Series Safety Controllers. It provides 4 additional sensor inputs where required to satisfy the system control requirements. Depending on the version, the Protect-IE monitors 1 NO/1NC or 2 NC contacts, as well as PNP-type devices (AOPDs or CSS). It is possible to cascade multiple units to monitor up to 80 sensors.

TECHNICAL FEATURES

Input Voltage	24 VDC
Number & Type of Outputs	• 2 N.O. (dry contacts) to master safety controller • -AN: 1 NO/1NC (dry contacts) to master safety controller
Number & Type Auxiliary (non-safety or signalling outputs)	4 – 24 VDC (Y1-Y4)
Reset & Feedback Monitoring	Performed by master controller
Typical Input Devices Monitored	• E-stops • Interlocks • Coded-magnets • PNP-type devices
LED Displays	Green LEDs for: • U_B (voltage at input terminals) • Y1-Y4 (status of inputs) • Y5 (overall system status)
Conformity to Standards	UL, CSA, BG (CE-compliant)
Stop Category	0
Safety Classification	A function of the master safety controller (mounted in same control cabinet), with a maximum of PL_d, per EN ISO 13849-1 Category 3, per EN 954-1
Selected Features	• Cage-clamp terminals • Cross-short recognition (selectable) • Electronic fuse • Compatible with all SRB Protect Series models with 2 N.C. inputs • -11-AN model is compatible with AES Series

AVAILABLE MODELS

Model Number	Monitoring Configuration of Sensors	Operating Voltage
Protect-PE-02	2 NC	24 VDC
Protect-PE-11	1 NC & 1 NO	24 VDC
Protect-PE-11-AN*	1 NC & 1 NO	24 VDC

Note: Screw terminals are also available. Add -SK to the end of the Model Number.

*-AN version has 1 NO/1NC Safety Outputs.

MECHANICAL SPECIFICATIONS

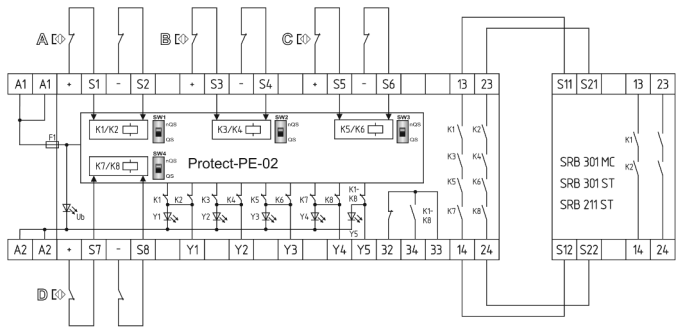
Dimensions (W x H x D)	65.5mm x 126mm x 61mm (2.58" x 4.96" x 2.4")
Ambient Operating Temperature Range	-25°C to +55°C (-13°F to +131°F)
Mechanical Life Expectancy	>10^7 switching cycles
Weight	140 gm
Mounting	DIN rail

ELECTRICAL SPECIFICATIONS

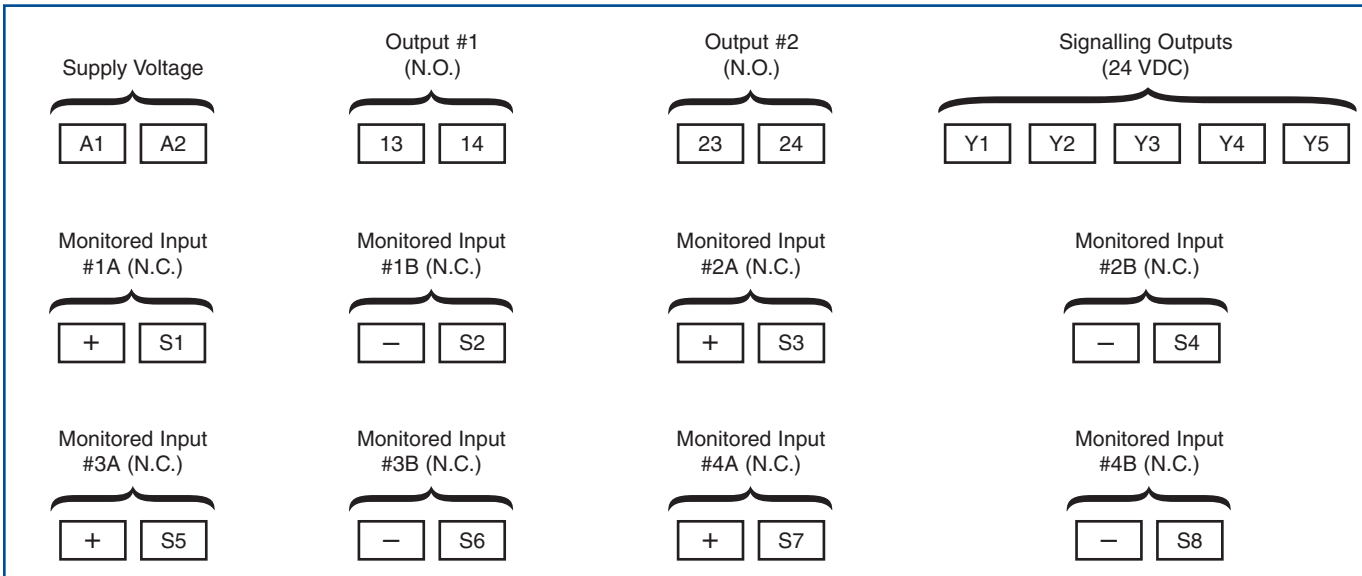
Operating Voltage	24 VDC -12% / +20%, residual ripple max. 10%
Power Consumption	1.7 W max.; plus Y1-Y5
Fuse (input power)	Internal electronic fuse, tripping current > 300 mA
Fuse (outputs)	2 A slow-blow
Switching Capacity (outputs)	24V, 2 A Resistive (inductive with suitable suppressor)
Switching Capacity (auxiliary contacts)	24 VDC, 100 mA (Y1-Y5)
Pick-up Delay	≤ 20 ms
Drop-out Delay	≤ 20 ms
Contact Resistance	100 mOhm (max. in new state)
Air Clearance & Creepage Distance	4 kV/2 to IEC/EN 60664-1
Cable Connections	• Cage-clamp terminals for min. 0.08mm² & max. 2.5mm² • Stranded or multi-core with wire end ferrule
Terminal Labeling	DIN EN 50 005 / DIN 50 013

10

Typical Wiring Diagram (Model Protect-IE-02 shown)



Terminal Connections (Model Protect-PE-02 shown)



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