Safety in System
Protection for man and machine

INNOVATIONS
2022/2023



SCHMERSAL
THE DNA OF SAFETY



TURNING WORKPLACES INTO SAFER PLACES.

The coronavirus pandemic has demonstrated the importance of machine safety and occupational health and safety protection, as only safe and healthy work can help to ensure functional operations. Since the start of the coronavirus pandemic, delivery bottlenecks have led to noticeable disruption in the production processes of many companies in the industry. To tackle these challenges, we have worked intensively on new developments and redevelopments, some of which we are pleased to showcase in this brochure.

In view of new challenges, we have also expanded existing, tried-and-tested products with new functions or accessories. This has led us to prepare our safety components and systems for new application areas and to adapt them to changed operational conditions. As with many other products, our safety switchgear has also been affected by disruption in international supply chains. Yet, by using alternative technologies and by developing systems tailored to your applications, we can continue to supply high-quality safety technology.

Our aim is to develop custom-fit safety solutions for our customers and to support them with any queries relating to machine safety. With this in mind, we offer a comprehensive range of services; for an overview of the services offered by our tec.nicum service division, please see page 26 onwards.

Talk to us – we look forward to working with you!

Heinz Schmersal and **Philip Schmersal**

Managing Directors of the Schmersal Group

www.schmersal.com

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products.schmersal.com

SCHMERSAL WEBSHOP

CONVENIENT **OPTIMISED** **INFORMATIVE** **EFFICIENT**

The Schmersal webshop gives you access to more than 7,000 safety and automation products, from simple electromechanical safety switches to programmable safety control systems and software. Each product is accompanied by up-to-date and comprehensive product information that can be retrieved at any time.

Operating instructions, EU declarations of conformity and certificates for components are available for download, together with additional documents. If a user has specific questions about a product or its use, he or she can make use of the live chat function to discuss with a skilled member of Schmersal's sales team during business hours.

THE NEW “H” PROGRAMME
HYGIENIC DESIGN COMMAND AND SIGNALLING DEVICES



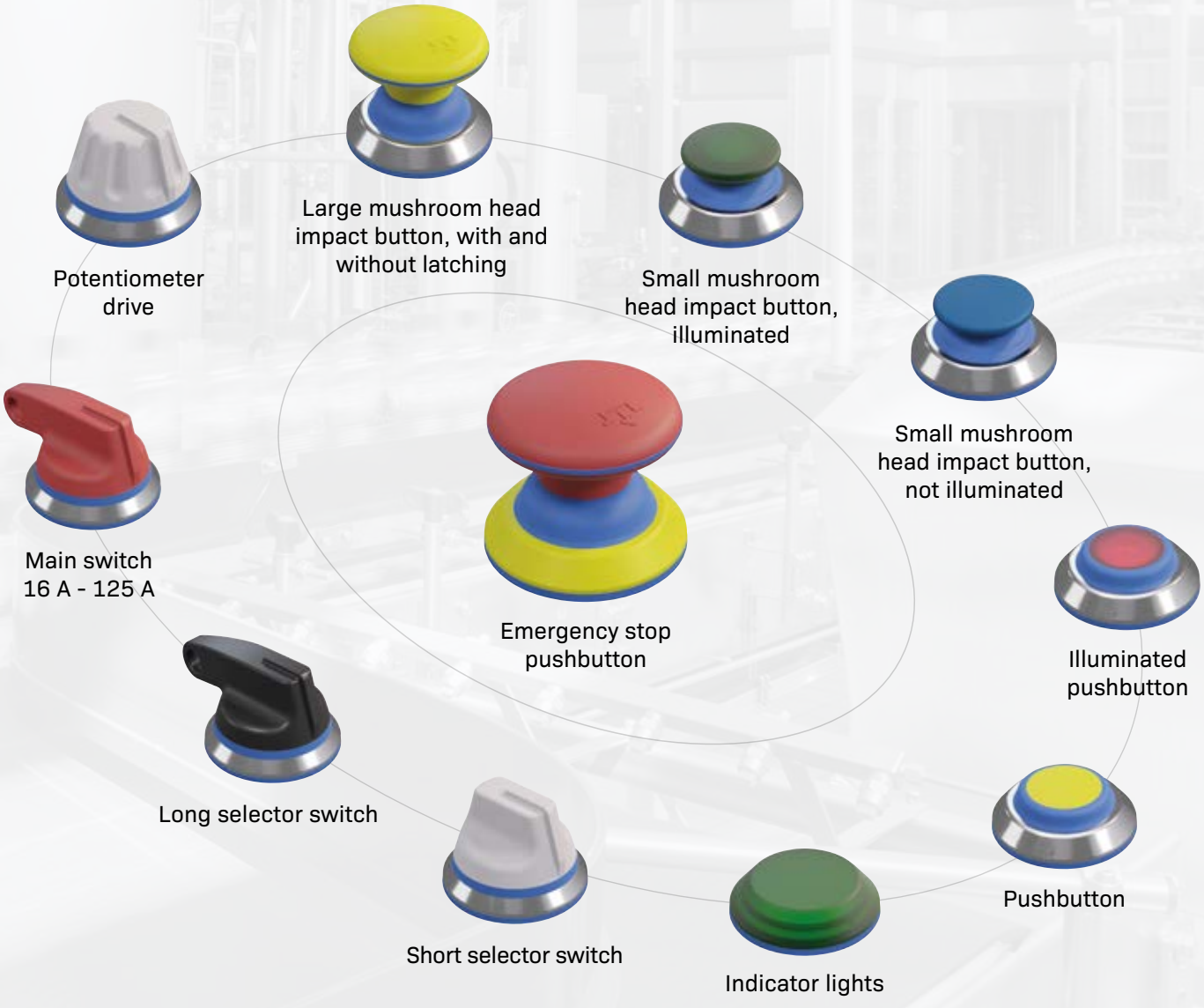
- Central nut for easy installation
- Simple disassembly of the contact carrier with a slotted screwdriver
- Contact element can be easily clipped on

The new hygiene command device product portfolio has been specially designed for use in hygiene-sensitive areas. At the heart of the development were requirements of hygienic design, which impose strict limits on the design of the shape geometry. The front ring corresponds to the specified angulation.
This allows liquids from foodstuffs, dirt particles and cleaning agents and disinfectants to run off more easily. The devices are equipped with high-quality plastic materials for the operating surfaces and stainless-steel front rings which enable a longer service life thanks to improved resistance to dirt and aggressive cleaning agents.

The new hygiene command device product portfolio also offers a new design with a central nut attachment for device heads, as well as a simple snap-on contact carrier than can support up to 6 contact elements. This enables a fast and efficient installation. In addition, the customer also has a number of options to fit devices with individual symbols or company logos by lasering.

THE ADVANTAGES AT A GLANCE

- Hygienic certified design
- Easy to clean thanks to lower dirt adhesion and IP69 degree of protection
- Simple installation concept with central nut and contact carrier
- Blue, visible hygienic gaskets
- High-quality, hygienic and chemical-resistant materials
- Durable, customisable symbols and logos applicable through lasering



SAFETY FIELDBOX SFB
COST-OPTIMISED, DECENTRALISED INSTALLATION SOLUTION



SAFETY FIELDBOX SFB

NEW **REVISED DEVICE VERSION 2**

- Safety outputs deployable via 1 cable without additional measures to cat. 3/PL d/SIL 2
- Safety outputs deployable via 2 cables now to cat. 4/PL e/SIL 3

PRODUCT PROPERTIES

- 8 universal 8-pin M12 device ports
- Connection of electronic and electro-mechanical switchgear devices
- 4 control panels (with EMERGENCY STOP) connectable
- 1-channel and 2-channel control of the interlocking function
- Automatic resettable fuse integrated
- M12 power connector with 10 A current carrying capacity
- Robust industrial design
- PROFINET / PROFIsafe field bus interface

Available from 2nd quarter of 2023:

- EtherNet/IP / CIP-Safety fieldbus interface

The safety fieldbox allows a wide range of safety switchgear devices to be connected in the field and freely interlinked in the safety controller on a decentralised basis. Straightforward connection with M12 connectors allows for quick and fail-safe installation.

The power supply to the fieldbox is via an M12 power connector with a current carrying capacity of 10 A. The cable section of 3 mm² allows for simple installation of the fieldboxes in series with a single central power supply.

Device ports
8 x connector M12,
8-pole

LED diagnostic
Extended status indication
of the safety switchgear

Communication
PROFINET with PROFIsafe
EtherNet/IP with CIP Safety

Power supply
M12 power connection with 10 A



Signal assignment
- 2 x F-DI: 2-channel safety input
- 1 x F-DQ: Safety output, internal, 2-channel
- 1 x DI: Digital input for diagnostic signal
- 2 x DQ test pulse: 2 test pulse outputs for NC contacts
- 24V and GND: Power supply of the connected safety switchgear

LED diagnostic
Extended status indication
of the safety fieldbox

UNIQUE OPPORTUNITIES

In addition to electronic and electro-mechanical safety sensors and switches, light grids, light curtains and light barriers can also be connected to a single device connection via Y-adapters.

A particular highlight of the Schmersal SFB is the ability to connect up to 8 solenoid interlocks with 1-channel or 2-channel actuation of the guard locking function.
The option to connect up to 4 control panels with EMERGENCY-STOP button and up to 3 non-safe command and signalling devices is unique.



POSITION SWITCH Z..476E
LATCHING POSITION SWITCHES WITH REMOTE RESET

POSITION SWITCH Z..476E

- Latching switching function
- Electrical remote reset via integrated solenoids
- Low actuating force and short pre-trigger path
- Switching principle – bistable magnetic snap-action system
- With screw terminals
- Thermoplastic enclosure





Angle roller lever K4



Angle roller lever 3K



Offset roller lever 1R

The Z..476E is a position switch with latching switching function that can be unlocked either manually or electrically via the integrated solenoids.

This allows the position switch to be used wherever a deliberate reset is needed after actuation, or in hard-to-access areas, such as the speed limiter on a lift.

The power supply for the rest magnets is designed for 24 V/DC or 230 V/AC. The magnet snap-action function gives the switch a low actuating force of 3 N and short switching travel of 0.5 mm. With the individual actuators, fitted in rotated configuration of 4x 90°, the Z..476E has various installation and actuation options.

PS SERIES POSITION SWITCHES WITH STATUS DISPLAY

- New versions with LEDs for status indication
- Actuating elements can be rotated in 45 degree steps
- Metal or thermoplastic enclosure
- Wide application range thanks to modular versatility and design
- Variants for temperatures down to –40 °C



PS316-K360



PS315-H326



PS215-H200



PS226-N200



PS216-K200

Now the series PS2xx and PS3xx position switches are also available with a status indicator.

While the green LED indicates operational readiness, the status indicator of the yellow LED can be connected by the customer to illuminate when either actuated or not actuated. This allows the customer to decide which switching condition to signalise.

The modular design, combined with the various actuating elements, enables a wide range of applications throughout all individual disciplines of machine and plant engineering.

PULL-WIRE EMERGENCY-STOP SWITCHES ZQ215 / ZQ315
PULL-WIRE SWITCHES TQ215 / TQ315
COMPACT PULL-WIRE SWITCHES
WITH TWO PULLING DIRECTIONS

PULL-WIRE EMERGENCY-STOP SWITCHES ZQ215 / ZQ315
PULL-WIRE SWITCHES TQ215 / TQ315

- Compact metal enclosure
- Wire pull and breakage detection
- Pulling direction of the eye to the left or right
- Release pushbutton on the pull-wire emergency stop switch
- Lengths of wire up to 25 m
- Optionally available with status LED



TQ315



ZQ215

This pull-wire switch series has been specially designed for use in challenging environments with minimal installation space. Thanks to a robust metal enclosure, a wide temperature range and high protection class, these pull-wire switches can also be used outdoors and in harsh environments, such as in mining, heavy industry, raw materials processing, etc. The construction form is compact and their dimensions are based on position switch standards (EN 50047/50041).

The pull-wire offset can point to the left or right and is designed for lengths of wire up to 25 m, too. With this series too, we have remained true to our concept of modularity. All pull-wire switches can be configured to customer requirements, with up to 3 switching elements, various connection options and even LED status indicators.
All versions can be supplied as pull-wire emergency stop switches. The advantage of pull-wire switches over mushroom head emergency-stop push buttons is that the emergency-stop function can be triggered anywhere along the wire.

PULL-WIRE EMERGENCY-STOP SWITCH ZQ901
PULL-WIRE EMERGENCY STOP SWITCH
WITH STAINLESS STEEL ENCLOSURE

PULL-WIRE EMERGENCY STOP SWITCH ZQ901

- Robust stainless steel housing
- Lengths of wire up to 75 m
- Wire pull and breakage detection
- Reset pushbutton
- Twisting of towing eye not possible



The new ZQ901 pull-wire emergency stop switch is characterised by its robust stainless steel enclosure. The stainless steel enclosure offers optimal mechanical and chemical protection in harsh environments and provides the ideal solution for a wide range of applications in new areas. Thanks to the new housing material, the ZQ901 can be used on transport and material handling systems as well as on large system used in the food processing and chemicals industries.

The tried-and-tested technology, used in industrial settings, meets the highest availability standards. The ZQ901 offers an emergency-stop function and manual reset, wire break detection and lengths of wire up to 75 metres. In conjunction with an appropriate safety analysis, the pull-wire emergency stop switch can be used up to PL e in accordance with EN ISO 13849-1.

SSB-R MAGNET TRACK SENSOR BOX
FOUR-TRACK POSITION DETECTION

SSB-R MAGNET TRACK SENSOR BOX

- Magnet track sensor box
- 4 shielded tracks in latching reed technology
- 2 optional fine positioning tracks with pre-warning indicator
- Optional second connector for signal distribution and track-related wire break monitoring
- Maintenance-free signal storage and changeover on voltage drop
- Wide-angle LED track indicator



Magnetic switching systems are characterised by wide-ranging wear resistance and tolerance in the event of misalignment. In the electric monorail conveyor and lift industry, magnetic switches are ideally used for positioning and control purposes.

The SBB-R sensor box captures the field of suitable actuator magnets on four independent tracks and, on pass-by, changes the signal status.

This level change, which occurs on rapid pass-by, is retained until the next activation, i.e. retentively.

A connected control unit uses the signals to determine the position and section of the sensorbox and controls, for example, the speed or holding positions of the drive motor. In addition, two angle sensors enable fine positioning.

SAFETY LIGHT BARRIERS IN PROTECTIVE ENCLOSURE SLB240/SLB440

- Hygienic design – end cap, fixation and membrane made of stainless steel V4A
- High degree of protection IP69
- Robust protective tube made of polycarbonate
- Connection: cable with M12 connector, 4 or 8 pin, length 0.2 m
- SLB240: Performance Level PL c, type 2
- SLB440: Performance Level PL e, type 4
- User-friendly parameter setting, no tools required
- Process reliability with daily cleaning
- Integrated set-up tool



ECOLAB®

The Schmersal Group has designed a new safety light barrier especially for hygiene-sensitive uses in the food processing industry, such as milk and meat processing.

This version has evolved with the demands of standard cleaning operations in the industry, as the sophisticated detailed design helps to ensure IP69 degree of protection (protection against the ingress of water from high-pressure of steam cleaning). The protective enclosure with external gaskets satisfies stringent standards and is designed to cope with frequent cleaning with water, foam, lyes, high-pressure or hot steam.

SOLENOID INTERLOCK AZM150
SLIMLINE DESIGN – HIGH CODING

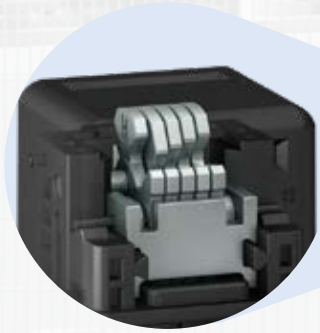


SOLENOID INTERLOCK AZM150

- Can now be combined with the DHS-150 Door Handle System
- Actuating head can be repositioned by 4x 90°
- Holding force F_{Zh} = 1,500 N
- Latching force 50 N
- Degree of protection IP65, IP67
- W x H x D: 40 x 204 x 48 mm
- Power to unlock / Power to lock
- Suitable for applications up to cat. 3/PL d

The new AZM150 electromechanical interlock boasts a slimline design and a holding force of 1,500 N. The AZM150 can be combined with a range of different actuators to suit different mounting situations, including a straight or angled actuator for sliding guards and a flexible actuator for small hinged guards.

One major benefit of the interlock is the rotating actuator head which, instead of a bolted connection, is locked in place simply by pressing the cover down. The 360 degree rotating actuator head with its two insert slits allows for a range of mounting and approach options for highly versatile use.



- Individually coded version with coding level “High” according to EN ISO 14119

NEW

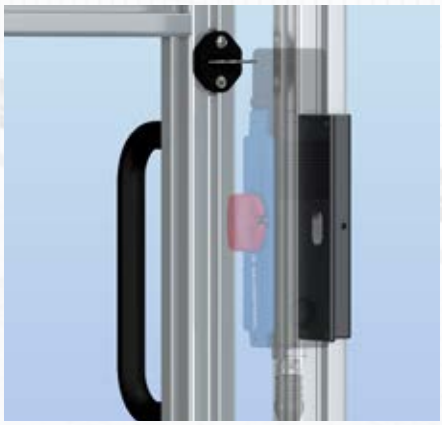


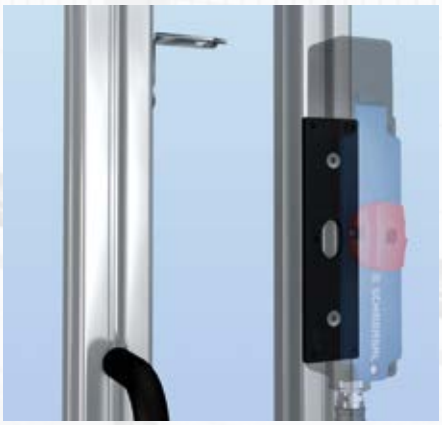
- New with M12 connector plug, 8-pole





- Manual release, emergency exit or emergency release





Angled and straight mounting plates for mounting to 40 mm profiles for hinged and sliding doors

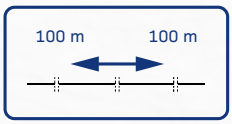


Individually coded version with coding level “High” according to EN ISO 14119

HEAVY DUTY SWITCHES HDS
THE FLEXIBLE AND MODULAR SWITCHGEAR PLATFORM



Dupline® Fieldbus Installationbus



PULL-WIRE EMERGENCY STOP SWITCHES RS655/RS656

- The emergency stop function can be triggered at any point on the wire (wire break function integrated)
- The maximum length of wire of 2x 100 m reduces the number of switches, and therefore minimises costs
- Reduced installation costs thanks to assembled, central connection terminal
- Includes DuplineSafe® interface: fail-safe series wiring including diagnostics with minimal wiring effort
- Pressure-setting plastic or grey cast iron enclosure for various application environments

Length of wire 100 m in both directions





SCHMERSAL



BASIC SWITCH BS655/BS656

- The basic switch can be combined with various actuators to form a position, belt misalignment or level switch
- Toothed shaft for form-fit connection of different actuators
- Adjustable switching angle
- Includes Dupline® interface: diagnostics functions with minimal wiring effort
- Pressure-setting plastic or grey cast iron enclosure for various application environments



SAFETY SENSORS
VERSIONS FOR EXPLOSION PROTECTION



SAFETY SENSOR
EX-BNS40S-2GD

- Zone 1 and 21 (gas and dust atmospheres)
- Ex mb (gas/dust) – encapsulation
- Suitable for food processing industry
- Stainless steel enclosure
- Concealed mounting possible
- Insensitive to transverse misalignment



Ex mb (gas/dust)
encapsulation

ZONE 0 / 20 | ZONE 1 / 21 | ZONE 2 / 22

SCHMERSAL

NON-CONTACT SAFETY SYSTEMS
VERSIONS FOR EXPLOSION PROTECTION



SAFETY LIGHT CURTAINS/GRIDS
EX-SLC/SLG440

- Zone 1 and 21 (gas and dust atmospheres)
- Ex db op is (gas) – flameproof enclosure, optical radiation
- Ex tb op is (dust) – protection by enclosure, optical radiation
- Protective enclosure made from copper-free aluminium, borosilicate glass and silicone gaskets
- Degree of protection IP66, IP67



Ex db op is (gas)
Flameproof enclosure,
optical radiation

Ex tb op is (dust)
Protection by
enclosure,
optical radiation

ZONE 2 / 22 | ZONE 1 / 21 | ZONE 0 / 20

SCHMERSAL

HEAVY DUTY SWITCHES HDS
VERSIONS FOR EXPLOSION PROTECTION

PULL-WIRE EMERGENCY STOP SWITCHES EX-RS655



- Zone 1 (gas atmospheres)
- Ex db (gas) – flameproof enclosure
- The emergency stop function can be triggered at any point on the wire
- The maximum length of wire of 2x 100 m reduces the number of switches required, thereby saving costs
- Suitable for applications up to PL e





Ex db (gas)
Pressure-resistant enclosure

ZONE 0 **ZONE 1** **ZONE 2**

SCHMERSAL

BASIC SWITCH
EX-BS655

- Zone 1 (gas atmospheres)
- Ex db (gas) – flameproof enclosure
- Basic switch can be combined with different actuators for position, belt misalignment or level switches
- All variants can be used as a safety switch
- Suitable for applications up to PL d







Ex db (gas)
Flameproof enclosure

ZONE 2 | ZONE 1 | ZONE 0

SCHMERSAL

SOLENOID INTERLOCK EX-AZM300
VERSIONS FOR EXPLOSION PROTECTION

SOLENOID INTERLOCK EX-AZM300-2D



- Zone 21 (dusty atmospheres)
- Ex tb (dust) – protection by enclosure
- Includes protective enclosure
- Suitable for applications up to PL e
- 3 LEDs to indicate operating modes



Ex tb (dust)
Protection by enclosure

ZONE 20 ZONE 21 ZONE 22

SCHMERSAL

PULL-WIRE EMERGENCY STOP SWITCH EX-I-ZQ900-2GD
VERSIONS FOR EXPLOSION PROTECTION

PULL-WIRE EMERGENCY STOP SWITCH EX-I-ZQ900-2GD

- Zone 1 and 21 (gas and dust atmospheres)
- Ex ib (gas/dust) – intrinsic safety
- Ex tb (dust) – protection by enclosure
- Reset pushbutton
- Position indication
- Wire pull and breakage detection
- Lengths of wire up to 75 m





SRB-EXI

Ex ib
Intrinsic safety



Ex ib
(gas/dust) –
Intrinsic safety



Ex tb (dust)
Only zone 21
or 22

ZONE 2 / 22

ZONE 1 / 21

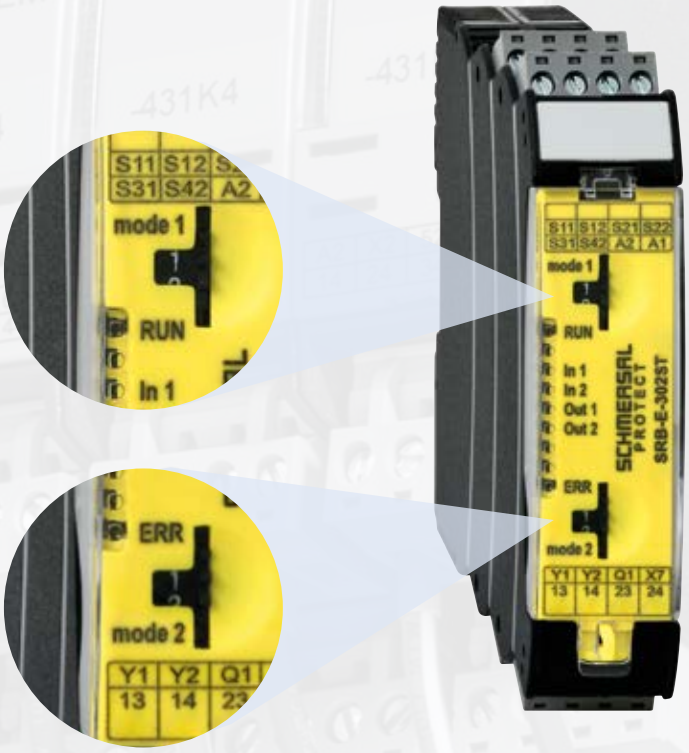
ZONE 0 / 20

SCHMERSAL

SAFETY RELAY MODULE
SRB-E-302ST

SAFETY RELAY MODULE
SRB-E-302ST

- Stop 0 function
- Monitoring of 2 sensors
- 24 adjustable applications
- 1- or 2-channel control
- Autostart/reset button with detection of the trailing edge
- 2 safety contacts / 1 safety output
- Application adjustment with “mode 1” rotary switch
- “Autostart” or “Reset button with edge monitoring” setting via “mode 2” rotary switch



The SRB-E-302ST module is suitable for monitoring 2 sensors in applications up to category 4/PL e in accordance with EN ISO 13849-1 and SIL 3 in accordance with IEC 61508.
All conventional electromechanical and electronic safety switches as well as safety sensors and active optoelectronic protective devices (AOPD) can be monitored.

The switching loads can be switched wear-free with a fail-safe semiconductor output or relay contacts, depending on the use.

OUTPUT EXPANDER MODULE
SRB-E-602EM

OUTPUT EXPANDER MODULE
SRB-E-602EM

- Contact expansion function
- 1x 6 safety contacts, STOP 0 or
  2x 3 safety contacts, STOP 0
- 2 signalling contacts
- Feedback contacts
- Temperature range –25 °C ... +60 °C
- Slot-in termination with coding



The undelayed output extensions of the SRB-E product series are used for contact expansion and reinforcement of fail-safe relays or semiconductor outputs and can be used as expansion modules of a basic component.

Basic components are all safety switchgear devices or safety controllers with feedback circuit monitoring.





excellence in safety

Functional machine safety is a complex matter which involves complying with a range of standards and directives. tec.nicum offers all machine manufacturers, operators and distributors a completely product and manufacturer-neutral consultancy on all currently relevant statutory regulations and supports them in ensuring their machines and workplaces are designed to comply with the relevant standards.

tec.nicum services cover four areas, which can be obtained as individual modules or as complete packages:

- **tec.nicum academy – Learning**
- **tec.nicum consulting – Consultancy services**
- **tec.nicum engineering – Technical planning**
- **tec.nicum integration – Practical implementation**

Experts at tec.nicum advise and support customers and clients with training, on-site consultation, documentation and planning and implementation, such as the installation of protective equipment and safety systems.

tec.nicum is the Schmersal Group's service division and comprises a global consultancy network of TÜV Rheinland-certified Functional Safety Engineers and Machinery CE Experts. Services can be called upon around the world. tec.nicum's core philosophy is to offer advice that is independent of manufacturers and as objective as possible.

We strive to develop the best possible safety-related solution for each individual application, to implement it and completely safeguard its intended use – always in line with our commitment **"excellence in safety – we care!"**

tec.nicum
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academy

- Seminars and training
- In-house training
- Customer-specific workshops
- Demonstration events
- Symposia

consulting

- Safety analyses of machines and production lines
- Conformity assessment and verification
- Risk assessments
- Hazard assessments
- Technical documentation

engineering

- Technical project planning
- Validation of safety functions
- Measurements and tests
- Modernisation of machines
- Safety controller programming

integration

- Conversion / Retrofitting
- Installation of protective devices and fences
- Integration of safety functions
- Maintenance and service

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The range at tec.nicum covers four modules: learning in the academy section, consultancy services in the consulting section, designing safety solutions in the engineering section and practical implementation in the integration section.

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THE SCHMERSAL GROUP
PROTECTION FOR MAN AND MACHINE



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 2,000 people and seven manufacturing sites on three continents along with its own companies and sales partners in more than 60 countries.

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 food & beverage, packaging, machine tools, lift switchgear, heavy industry and automotive.

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 design 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

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

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