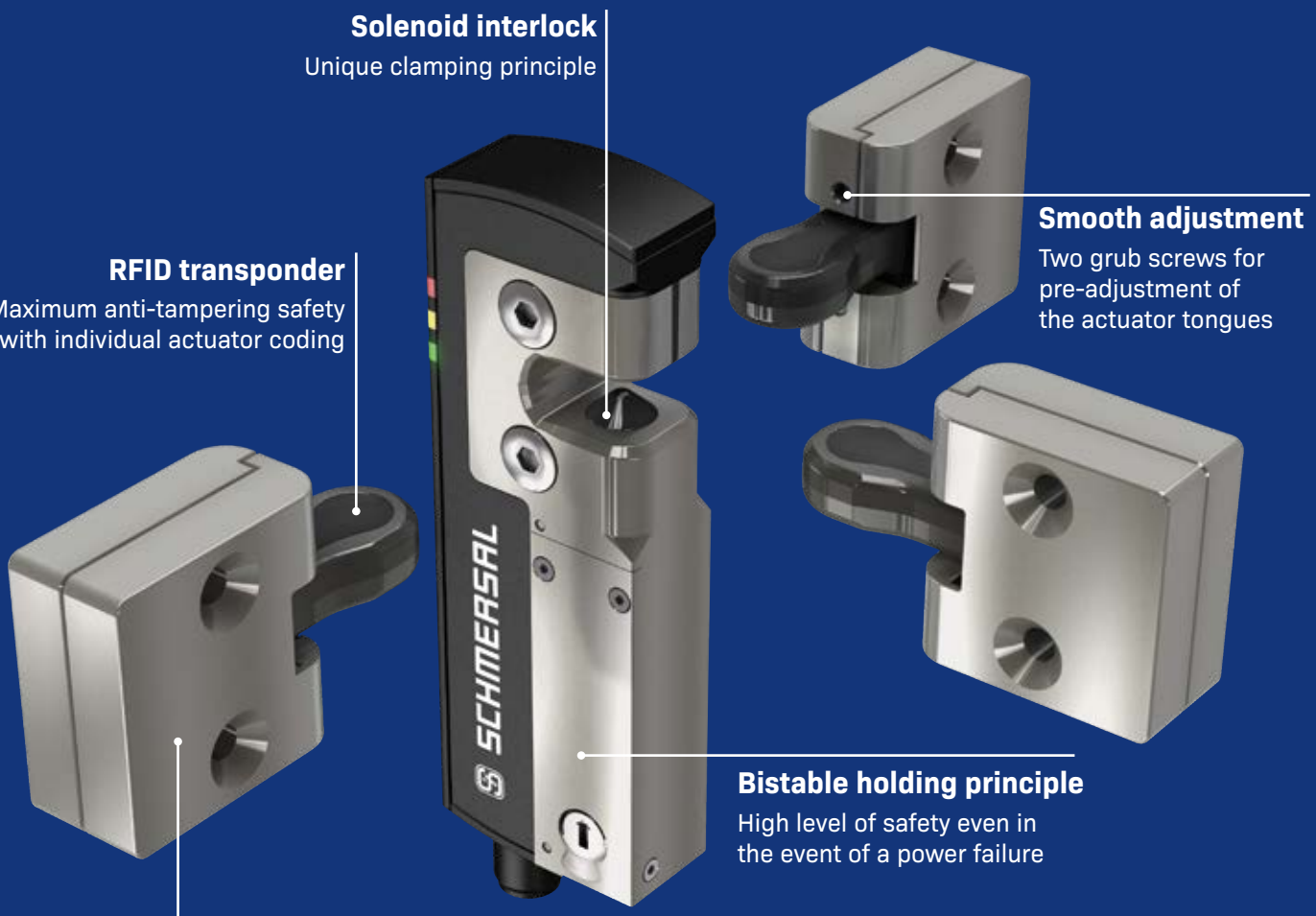
The smallest electronic
solenoid interlock in the world

AZM40
THE COMPACT SOLENOID INTERLOCK

NEW

SCHMERSAL
THE DNA OF SAFETY



- Compact dimensions (W × H × D: 40 × 119.5 × 20 mm)
- Bistable holding principle
- Strong holding force F_{Zh} = 2,000 N, F_{max} = 2,600 N
- Ambient temperature –20 °C up to +55 °C
- Latching force approx. 40 N
- Individually coded version with coding level "High" according to ISO 14119
- Degree of protection IP66/IP67/IP69
- Suitable for applications up to Cat. 4 / PL e / SIL 3

www.schmersal.com

AZM40
THE SMALLEST ELECTRONIC SOLENOID INTERLOCK IN THE WORLD

RFID sensor system
Less sensitive to error thanks to optimal positioning of the RFID sensors

High holding force
F_{Zh} = 2,000 N, F_{max} = 2,600 N

Interlock monitored
Position monitoring of locking bolt

- Can be retrofitted with emergency exit and emergency release
- Optimised for mounting on 40 mm profiles
- Symmetrical mounting, mountable on both sides
- Actuator can approach interlock continuously within a 180° angle
- Only one version for hinged and sliding doors
- LEDs visible from three sides
- Series-wiring without reduction of the safety level
- Actuator or guard locking monitoring

SAFE. FLEXIBLE. SMALL.
THE BISTABLE SOLENOID INTERLOCK AZM40

UNIQUE CLAMPING PRINCIPLE

The AZM40 has a unique locking function with patent pending. With this innovative clamping principle, the tapered locking bolt of the AZM40 drops into a counter contour in the actuator, whereas with a conventional lock, the locking bolt passes completely through the opening in the actuator.

LATERAL FORCE COMPENSATION REDUCES DOWNTIME

The clamping principle has several benefits:
As the locking bolt is connected to the actuator by only a chamfered surface, lateral forces are easier to compensate. The innovative locking mechanism enables locking and unlocking against slightly tensioned doors and flaps. This ensures the smooth flow of production processes, and helps to minimise downtime.

LESS SENSITIVE TO ERROR THANKS TO OPTIMAL POSITIONING OF THE RFID SENSORS

In addition, the clamp locking also allows the RFID sensors to be positioned in the centre, opposite the locking bolt. As such, the system is less sensitive to error from external RFID fields or other RFID systems, allowing multiple devices to be installed alongside one another.

In addition, a tilted and angled actuator can be better compensated. This in turn increases machine availability.

CONCEALED INSTALLATION OF THE SENSORS

The central positioning of the sensors means that the AZM40 can be installed in a concealed position, such as in a profile. This dispenses the need for additional recesses for RFID communication, eliminating the influence of the profile walls in the detection area.

SAFE. FLEXIBLE. SMALL.
THE BISTABLE SOLENOID INTERLOCK AZM40

AREAS OF APPLICATION

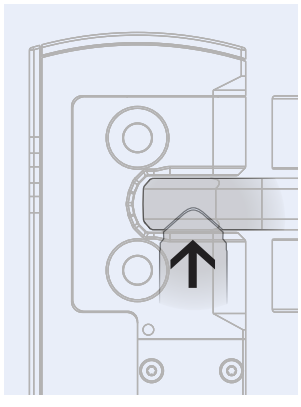
The possibility of installing the solenoid interlock in confined spaces and in different positions means that the areas of application for the AZM40 are many and varied.

The AZM40 is particularly suitable for installation on machines equipped with small flaps or rotating/sliding doors. The emergency exit and emergency release are available as retrofittable accessories for use on larger and accessible safety guards.

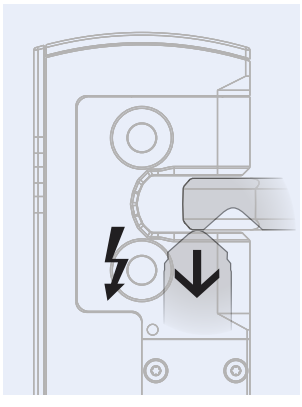
PACKAGING MACHINES

PHARMA INDUSTRY

WOOD-PROCESSING



Energy OFF: actuated



Energy ON: unlocked

BISTABLE SYSTEM: SAFE, ENERGY-SAVING

The AZM40 operates to a bistable holding principle. This means that, in the event of a power failure, the interlock maintains its last locking status.

Safe operation is assured in any operating condition of the machine as even if the system is in a run-down movement and presents a danger, the safety door remains securely closed if power has been cut-off.

In addition, energy consumption with the bistable principle is lower.

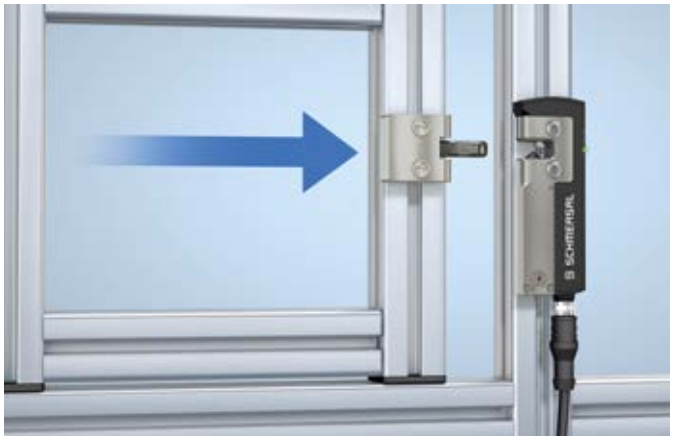
HIGH FLEXIBILITY

Thanks to the 180° angle flexibility, the actuator can approach continuously so that the interlock can also be used on flaps that do not close at a 90° angle or that open upwards at a 45° angle.

The angle flexibility ensures that the interlock can be easily installed even in confined and difficult-to-access locations.

ROTATING DOORS

SLIDING DOORS



SAFE. FLEXIBLE. SMALL.
THE BISTABLE SOLENOID INTERLOCK AZM40

PROTECTING HUMANS AND MACHINES

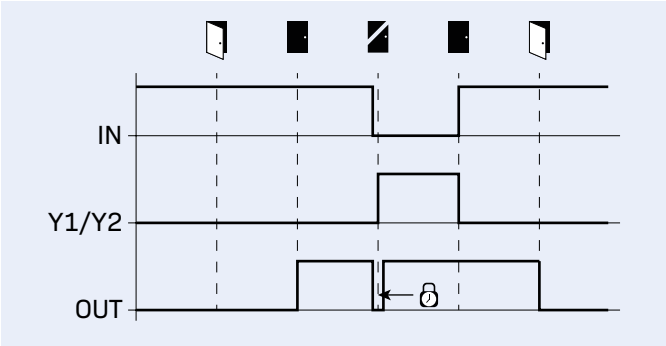
Two versions of the AZM40 can be selected, according to the requirement.

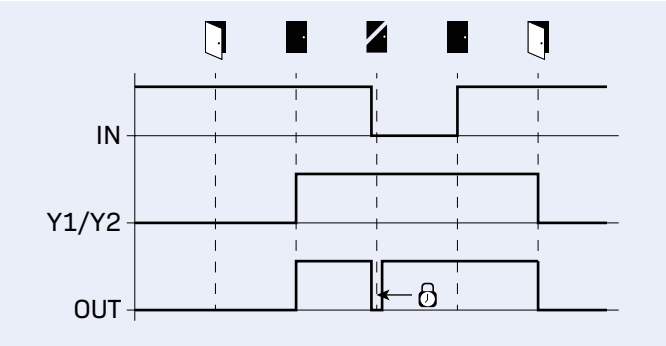
AZM40Z – GUARD LOCKING MONITORED

The safety outputs of the AZM40Z solenoid interlock are enabled only when the safety guard is closed and the interlock is locked. This variant is primarily for personal safety.

AZM40B – ACTUATOR MONITORED

The AZM40B version (actuator monitoring) can be used for applications where process protection is required. The safety outputs of this variant are already enabled when the safety guard is closed. With this device, the solenoid interlock must not be imperatively locked.





Key

IN	Magnet control (bistable)
Y1/Y2	Safety outputs
OUT	Diagnostic output

Door opened

Door closed, not locked

Safety guard locked

Locking time: ≥200 ms

NOTICE

The interlock maintains the last position in the event of power failure.

ANTI-TAMPERING SAFETY WITH INDIVIDUAL CODING

If interlocking devices are tampered with, the machine is no longer operated in accordance with the manufacturer's specifications. As a result, the operator could be exposed to a considerably higher risk.

If tampering cannot be excluded by using modified or additional operating modes, the machine builder can only take one more measure, i.e. making the tampering of the interlocking device more difficult or impossible. (Excerpt from ISO 14119)

In its basic version, the AZM40 accepts any suitable actuator. By integrating RFID technology in the safety sensors, the coding level high can be reached for the individually encoded versions in accordance with ISO 14119.
Version -I1 only accepts an actuator for which the teach-in process was run upon initial activation.

With the third version -I2, this teach-in process can be repeated as many times as necessary. A release block of ten minutes prevents a quick change of the actuator and protects the system further against manipulation. In this way, the user can choose the most suitable coding variant for the intended application as well as the desired degree of protection against tampering.

Automatic teach-in of the actuator incl. ten-minute release block

SAFE. FLEXIBLE. SMALL.
THE BISTABLE SOLENOID INTERLOCK AZM40

SERIES-WIRING WITHOUT REDUCTION OF THE SAFETY LEVEL

Due to extensive integrated monitoring functions, the AZM40 can be switched in series with all other electronic safety switchgear from Schmersal. This makes monitoring multiple safety doors in a single system much easier and more cost-effective. The electronic solenoid interlocks in the series monitor themselves. The series-switched solenoid interlocks satisfy the requirements of category 4 in accordance with ISO 13849.

Errors within the chain, e.g. a short-circuit to the safety output lines to the control cabinet, are detected automatically. The outputs switch off and the fault is signalled at the diagnostic LEDs on the solenoid interlock and signal output.

COMPREHENSIVE SELF-DIAGNOSIS

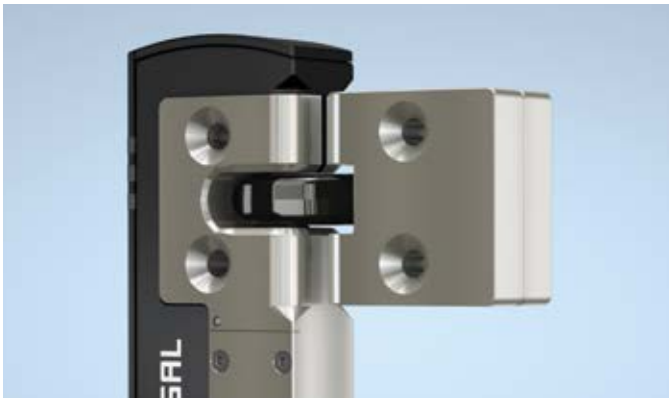
Continuous self-tests ensure the function of the solenoid interlock as well as the two-channel safety outputs. An error at the safety output, but also a short-circuit, is signalled by different colours or flashing pulses from the integrated three-colour diagnosis LEDs. General errors such as excessive ambient temperature are also detected and displayed.

Simple diagnosis with 3 coloured LEDs

TWO ENCLOSURE VERSIONS

Both the solenoid interlock and actuator are available with two enclosure versions. For typical use in mechanical engineering, there are enclosures with a flat, screw-on surface for cylinder-head bolts. For visually improved installation and where space saving is a priority, there is a version with countersunk taper for countersunk bolts.

Enclosure with flat screw-on surface (-PH) for cylinder-head bolts.



Enclosure with countersink for countersunk-head screws

TECHNICAL DATA AND ORDERING DETAILS AZM40

Technical data	AZM40
Holding force F_{Zh}/F_{max}:	2 000 N / 2 600 N
Latching force:	40 N (± 25%)
Degree of protection:	IP66/IP67/IP69
Dimensions (W × H × D)	40 × 119.5 × 20 mm
Mounting position:	Arbitrarily
Temperature range:	–20 °C ... +55 °C
Enclosure material:	Glass fibre reinforced thermoplastic, self-extinguishing/ light metal die cast
Actuator material:	Stainless steel/light metal die cast
Supply voltage:	24 VDC –15 % / +10 %
Electrical connection:	Connector plug M12, 8-pole
Outputs:	1 diagnostic output, 2 safety outputs, all p-type
Diagnostic and status display:	LEDs (green, yellow, red) visible from three sides
Safety classification **- of the interlocking function:** **- of the guard locking function:**	ISO 13849-1, IEC 61508 PL e / Cat. 4 / SIL 3 PL d / Cat. 2 / SIL 2
Registrations:	TÜV, cULus

Guard locking monitored	Actuator monitored	Standard coding	Individual coding, can be taught once -I1	Individual coding, re-teaching enabled -I2	Diagnostic output	Enclosure with countersunk taper for countersunk bolts	Enclosure with flat mounting surface for cylinder-head bolts	Type	Material number
■		■			■	■		AZM40Z-ST-1P2P	103034187
■			■		■	■		AZM40Z-I1-ST-1P2P	103034188
■				■	■	■		AZM40Z-I2-ST-1P2P	103034189
■		■			■		■	AZM40Z-ST-1P2P-PH	103037333
■			■		■		■	AZM40Z-I1-ST-1P2P-PH	103037334
■				■	■		■	AZM40Z-I2-ST-1P2P-PH	103037335
	■	■			■	■		AZM40B-ST-1P2P	103034193
	■		■		■	■		AZM40B-I1-ST-1P2P	103034194
	■			■	■	■		AZM40B-I2-ST-1P2P	103034195
	■	■			■		■	AZM40B-ST-1P2P-PH	103037330
	■		■		■		■	AZM40B-I1-ST-1P2P-PH	103037331
	■			■	■		■	AZM40B-I2-ST-1P2P-PH	103037332

Actuator with countersunk taper	**AZM40-B1**	**103034199**
Actuator with flat screw-on surface	**AZM40-B1-PH**	**103037328**

SAFE. FLEXIBLE. SMALL.
THE BISTABLE SOLENOID INTERLOCK AZM40

Lever or pushbutton for emergency exit or emergency release

EMERGENCY EXIT AND EMERGENCY RELEASE

Two different versions are available. The lever is available both as an emergency exit and as an emergency release and can be mounted directly on the AZM40.

Additionally, there is a push button for emergency exit or emergency release. Since it is similar to an EMERGENCY STOP push button, it is intuitive to operate.

LOCKOUT TAG

For larger, accessible machines and systems, service staff can attach a lock to the lockout tag when entering the hazardous area. In this way, the guard door cannot be closed and an unintentional machine start-up is prevented.

- Attachment of up to six padlocks possible
- Suitable for mounting inside and outside of the hazardous area
- Practical retaining strap with securing chain

MOUNTING PLATES

The AZM40 can be easily mounted directly on 40 mm profile systems.

For deviating profile system widths (20 mm, 30 mm, 45 mm, 50 mm and 60 mm), the set consisting of two universal mounting plates for the AZM40 and the actuator can be used. This ensures fast and cost-effective assembly for a wide range of profile system widths.

OPTIONAL SYSTEM COMPONENTS

Description	Type	Material number
Emergency exit	**ACC-AZM40-LEV-T**	**103054265**
Emergency release	**ACC-AZM40-LEV-N**	**103054268**
Emergency exit with pushbutton – for 40 mm profiles – for profiles up to 170 mm	 **ACC-AZM40-PT-T-40MM** **ACC-AZM40-PT-T-170MM**	 **103054271** **103054273**
Lockout tag	**SZ40**	**103053182**
Universal mounting plate, for 20, 30, 45, 50 and 60 mm profile systems, 2 pcs.	**MP-AZM40**	**103045324**
Tamper-proof bolts M5 x 25, flat head, 2 pcs.	**ACC-NRS-M5X25-FHS-2PCS**	**103045415**
Tamper-proof bolts M5 x 25, countersunk head, 2 pcs.	**ACC-NRS-M5X25-CSS-2PCS**	**103045416**

ACC-AZM40-LEV-T / -N

- Emergency exit (-T) for mounting and actuation only from **within** the hazardous area
- Emergency release (-N) for fitting and actuation only on the **outside** of the safety guard

ACC-AZM40-PT-T / -N

- Emergency exit (-T) for mounting and actuation only from **within** the hazardous area
- Emergency release (-N) for fitting and actuation only on the **outside** of the safety guard

SZ40 103053182

- Lockout tag with 6 bore holes for AZM 40
- To prevent inadvertent closing, e.g. during maintenance

ACC-NRS-M5X30-CSS-2PCS 103040845

- M5 Countersunk bolt with unidirectional slots

ACC-NRS-M5X29-FHS-2PCS 103040844

- M5 Flat headed bolt with unidirectional slots

MP-AZM40 103045324

- For profile system widths of 20 mm, 30 mm, 45 mm, 50 mm and 60 mm

DOOR HANDLE SYSTEM DHS-U1
NEW STANDARDS IN ERGONOMICS, FUNCTIONALITY AND DESIGN

DOOR HANDLE SYSTEM DHS-U1

- Machine status directly recognisable on the handle
- Optimised for the AZM40 solenoid interlock and the RSS260 safety sensor
- Ergonomic door handle for left or right hinged safety guard
- Degree of protection IP66, IP67 (with operating element)
  IP66, IP67, IP69 (without operating element)

Illuminated handle in seven colours: white, yellow, green, light blue, blue, violet, red

Coloured push button cover caps in five colours: white, yellow, green, blue, red

The innovative DHS door handle system combines the functions of a robust door handle with the signalling of various machine statuses via large-scale illumination of the handle.

The RGB technology used makes it possible to illuminate the handle in seven different colours. The colours can be individually controlled by the customer so that, for example, the respective machine status can be seen directly on the handle.

A push button is also available, which can be individually adapted to customer requirements using the coloured push button cover caps supplied. The push button can, for example, fulfil the tasks of a reset function or a request to open the safety guard.

In addition to the version with illumination and with push button, versions with illumination and without push button, without illumination and with push button and versions without electrical connection are also available.

CONTROL PANEL BDF40
INTUITIVE CONTROL, ELEGANT DESIGN

CONTROL PANEL BDF40

- Slimline design to match the AZM40 solenoid interlock and the DHS door handle system
- Flexibility thanks to mountable pushbutton cover caps in 12 colours
- Generous open spaces for easy labelling
- Quick and error-free installation thanks to M12 connector
- Tamper protection with cover caps for the door system

Ergonomic and perfect integration with AZM40 solenoid interlock and DHS door handle system

The new BDF40 control panel is characterised by its modern and slim design. It is available in two versions, with or without EMERGENCY STOP function, and offers a choice of exchangeable, coloured push button cover caps for push buttons or illuminated push buttons.

The control panel can be perfectly integrated into a door system with the AZM40 solenoid interlock and the DHS door handle with a connecting cover. Alternatively, it can also be installed as a stand-alone control panel. The 12-pin M12 connector allows quick and error-free installation.

SAFE. FLEXIBLE. SMALL.
THE BISTABLE SOLENOID INTERLOCK AZM40

SMOOTH AND FAIL-SAFE INSTALLATION

Schmersal's installation systems enable quick, simple and cost-effective installation.

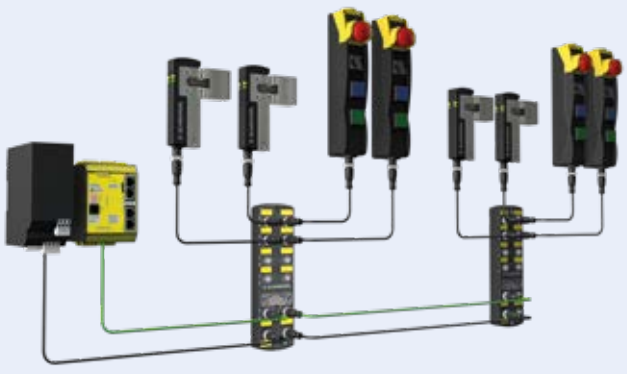
Wiring errors are entirely prevented and wiring effort is considerably reduced. Active and passive installation systems are available.

SAFETY FIELDBOX SFB

- Active installation system
- Free interlinking of safety switchgear devices
- Connect up to 8 safety switchgear devices
- PROFINET/PROFIsafe field bus interface to superior safety controller
- Diagnostic signals of all connected safety switchgear can be evaluated

PASSIVE FIELDBOX PFB

- Passive installation system
- Series-wiring of safety switchgear
- Connect up to 4 safety switchgear devices
- Individual protection of safety switchgear



Simple and flexible installation using the Safety Fieldbox

SAFETY-MONITORING MODULE

Solutions based on safety controllers and safety relay modules with a variety of visualisation and diagnosis options for fail-safe signal evaluation – depending on the complexity and connection depth of the safety circuits.

The multifunctional SRB-E-FWS-TS safety relay modules contain the fail-safe standstill monitoring and fail-safe time relay functions in a single component. The SRB-E-402FWS-TS module version also offers the option of safety door monitoring contact or output monitoring.

In the event of hazardous movements, this module version allows safety door opening to be blocked and, with the second safety function – safety door monitoring – movement to be reliably deactivated. In addition, fail-safe outputs prevent machine startup when a door is open.

WIDE RANGE OF ACCESSORIES
FOR INSTALLATION, ASSEMBLY AND EVALUATION

INSTALLATION

		Description	Type	Material number
Safety fieldbox SFB		■ Free linking of safety switchgear ■ Connect up to 8 safety switchgear units ■ PROFINET/PROFIsafe fieldbus interface to superior safety controller ■ Diagnostic signals of all connected safety switchgear can be evaluated	**SFB-PN-IRT-8M12-IOP**	**103015478**
Passive fieldbox PFB		■ Series-wiring of safety switchgear ■ Connect up to 4 safety switchgear units ■ Individual protection of safety switchgear	**PFB-IOP-4M12-IOP**	**103013573**

Description	Length	Type	Material number
Connecting cable M12/8 pole with female plug	5.0 m	**A-K8P-M12-S-G-5M-BK-1-X-A-4-69-VA**	**101210560**
Connecting cable M12/8 pole with female plug	10.0 m	**A-K8P-M12-S-G-10M-BK-1-X-A-4-69-VA**	**103001389**
Connecting cable M12/8 pole with female plug	2.5 m	**A-K8P-M12-S-G-2.5M-BK-2-X-A-4-69**	**103011415**
Connecting cable M12/8 pole with female plug	5.0 m	**A-K8P-M12-S-G-5M-BK-2-X-A-4-69**	**103007358**
Connecting cable M12/8 pole with female plug	10.0 m	**A-K8P-M12-S-G-10M-BK-2-X-A-4-69**	**103007359**
Connecting cable M12/8 pole with female plug	2.0 m	**A-K8P-M12-S-W-2M-BK-2-X-A-2**	**101209969**
Connecting cable M12/8 pole with female plug	5.0 m	**A-K8P-M12-S-W-5M-BK-1-X-A-4-69-VA**	**101210561**

SAFETY-MONITORING MODULE

		Description	Type	Material number
Safety relay module PROTECT SRB-E		■ Function STOP 0 ■ 1- or 2-channel control ■ Start button / autostart ■ 2 safety outputs 5,5 A ■ 1 signalling output	**SRB-E-201ST**	**103008067**
		■ Standstill monitoring using 1 or 2 impulse sensors ■ Additional standstill signal ■ 2-channel time monitoring ■ 2-channel safety door monitoring ■ 2 safety contacts ■ 2 safety outputs ■ 2 signalling outputs	**SRB-E-402FWS-TS**	**103014757**
Safety controller PROTECT PSC1		■ Freely programmable ■ 14 safe inputs ■ 4 safe semi-conductor outputs ■ 1 safe relay path ■ Modular expandable up to 64 in-/outputs ■ Safe drive monitoring according to EN 61800-5-2 for 1 axis ■ Fieldbus protocol (Profinet/Ethercat/ EthernetIP) selectable via software	**PSC1-C-10-SDM1-FB1**	**103008445**
		■ Freely programmable ■ 14 safe inputs ■ 20 adjustable safe in-/outputs ■ 4 safe semi-conductor outputs ■ 1 safe relay path ■ Modular expandable up to 272 in-/outputs ■ Safe drive monitoring according to EN 61800-5-2 for up to 12 axes ■ Universal communication interface supports standard fieldbus systems with only one hardware ■ Fieldbus protocol (Profinet/Ethercat/ EthernetIP) selectable via software ■ Safe remote IO- and master-master-communication	**PSC1-C-100-FB1**	**103008452**

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 nations.

Customers of the Schmersal Group include “Global Players” in mechanical engineering and plant manufacturing and operators of machinery. They benefit from the company’s extensive expertise as a provider of systems and solutions for machine safety. In addition, Schmersal specialises in various areas including intralogistics, foodstuff production, the packaging industry, machine tool industry, lift switchgear, heavy industry and the automotive industry.

A major contribution to the systems and solutions offered by the Schmersal Group is made by tec.nicum with its comprehensive range of services: Certified Functional Safety Engineers advise machinery manufacturers and machinery operators in all aspects relating to machinery and occupational safety – and do so with product and manufacturer neutrality. Furthermore, they 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
- tec.nicum digitalisation – Software solutions and new digital technologiese
- tec.nicum oursourcing – Complete solutions

x.000 / L+W / 08.2024 / Teile-Nr. 103034411 / EN / Ausgabe 04

SCHMERSAL
THE DNA OF SAFETY

www.schmersal.com