

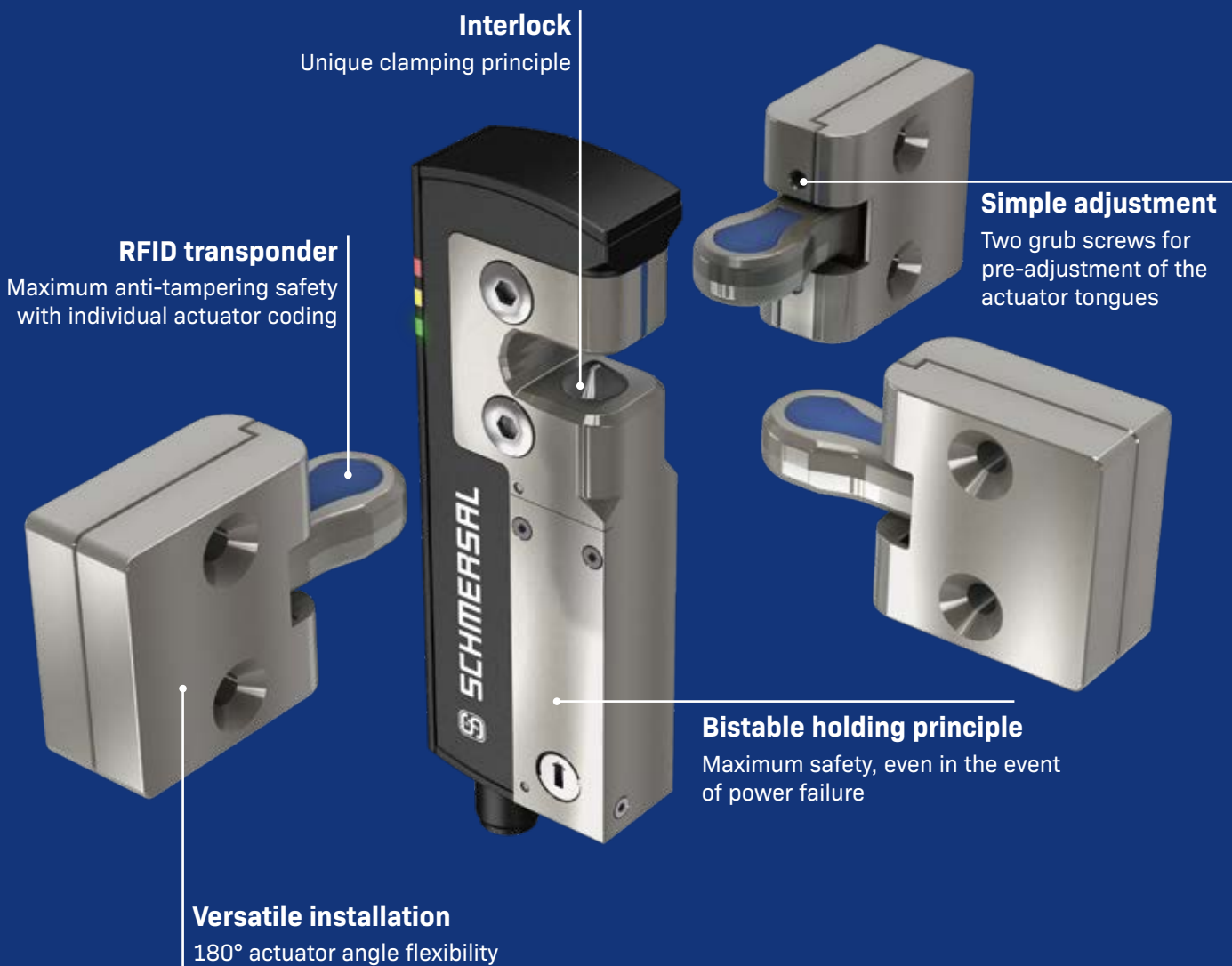
The smallest electronic  
safety interlock in the world

# AZM40 THE COMPACT SAFETY INTERLOCK

NEW



 **SCHMERSAL**  
THE DNA OF SAFETY



- Compact dimensions  
(WxHxD: 40 x 119.5 x 20 mm)
- Bistable holding principle
- Strong holding force  
 $F_{Zh} = 2,000 \text{ N}$ ,  $F_{max} = 2,600 \text{ N}$
- Latching force approx. 25 N
- Individually encoded versions with coding level high in accordance with ISO 14119
- Suitable for applications to cat. 4/PL e/SIL 3

# AZM40

## THE SMALLEST ELECTRONIC SAFETY INTERLOCK IN THE WORLD

### RFID sensor system

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

### Strong holding force

$F_{Zh} = 2,000 \text{ N}$ ,  $F_{max} = 2,600 \text{ N}$

### Interlock monitored

Position monitoring of locking bolt



- Optimised for mounting to 40 mm profile
- Symmetrical mounting, mountable on both sides
- Actuator can approach interlock continuously within a 180° angle
- One version for rotating and sliding doors
- LEDs visible from three sides
- Series switching without reducing the safety level
- Actuator or interlock monitored

# SAFE AND SECURE. FLEXIBLE. SMALL. THE BISTABLE SAFETY 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 lightly braced 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 AND SECURE. FLEXIBLE. SMALL. THE BISTABLE SAFETY INTERLOCK AZM40

## AREAS OF APPLICATION

The possibility of installing the safety 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.

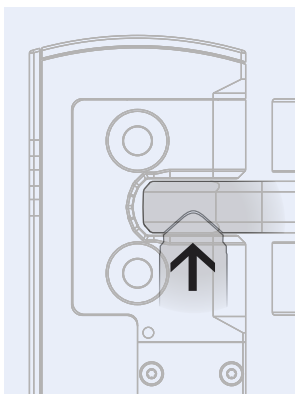
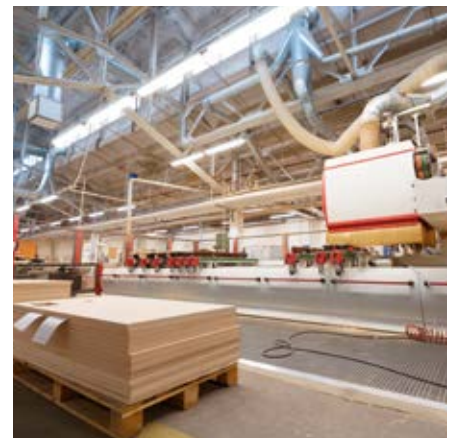
### PACKAGING MACHINES



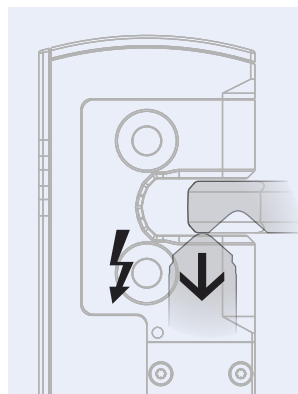
### PHARMACEUTICAL INDUSTRY



### WOODWORKING



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 power failure, the last locking position will be retained.

Safe operation is thus ensured in all machine operating states, as the safety guard remains securely closed in the event of power failure, even with run-on and hazardous movements.

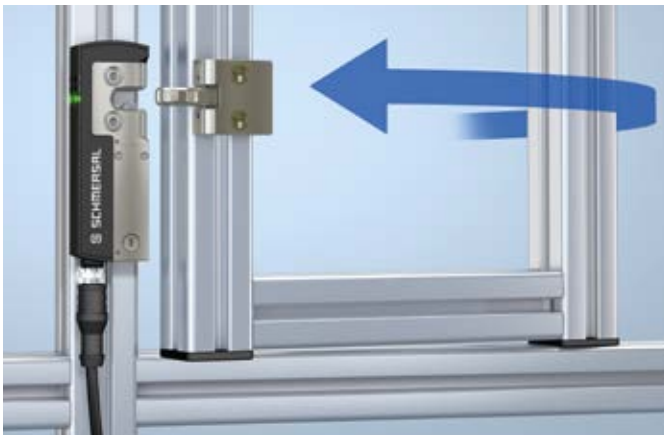
In addition, energy consumption with the bistable principle is lower.

## MAXIMUM FLEXIBILITY

Thanks to the 180° angle flexibility, the actuator can approach the AZM40 on a continuous basis, making the interlock also suitable for flaps which do not close at 90° or those that open upwards to a 45° angle.

The angle flexibility helps the interlock to easily fit into confined spaces and those that are difficult to access.

## ROTATING DOORS



## SLIDING DOORS



# SAFE AND SECURE. FLEXIBLE. SMALL. THE BISTABLE SAFETY INTERLOCK AZM40

## PERSONAL AND PROCESS PROTECTION

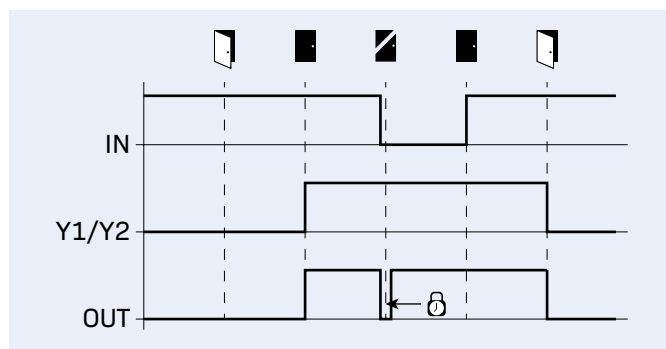
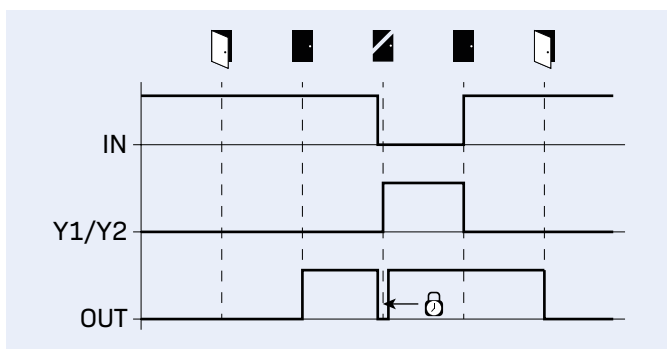
Two versions of the AZM40 can be selected, according to the requirement.

### AZM40Z – MONITORED INTERLOCKING

On the AZM40Z safety interlock, the safety outputs are switched on only when the safety door is closed and the interlock locked. This version is primarily used for personal protection.

### AZM40B – ACTUATOR MONITORED

The AZM40B model can be used for applications with process protection. In this versions, the safety outputs are actuated as soon as the safety door is closed. With this device, locking the interlock is not absolutely necessary.



#### Key

IN Solenoid actuation (bistable)

Y1/Y2 Safety outputs

OUT Diagnosis output

Door opened

Door closed, not locked

Door locked

Locking time:  $\geq 200$  ms

#### NOTE

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

## ANTI-TAMPERING SAFETY WITH INDIVIDUAL CODING

In the event that locking devices are bypassed, the machine will no longer operate under the conditions specified by the manufacturer. This can significantly elevate the risk to the operator.

If bypassing cannot be prevented by changed or additional operating modes, the designer has only one measure available: bypassing the locking device must be made difficult or impossible (extract from ISO 14119).

The basic version of the AZM40 accepts any suitable actuator. Thanks to the integration of RFID into the safety sensor technology, the individually coded models are capable of achieving high level coding in accordance with ISO 14119.

Version -I1 accepts only the actuator associated with the teach-in process during initial activation.

With a third version, version -I2, this teach-in process can be repeated as many times as required. A release block of ten minutes prevents an actuator from being replaced in the short term and in turn enhances anti-tampering safety as a result. This way, the user can choose a coding version that best suits his needs and also determine the level of anti-tampering protection.



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

# SAFE AND SECURE. FLEXIBLE. SMALL. THE BISTABLE SAFETY INTERLOCK AZM40

## SERIES CONNECTION WITHOUT REDUCING 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 safety interlocks in the series monitor themselves. The series-switched safety 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 safety interlock and signal output.

## COMPREHENSIVE SELF-DIAGNOSIS

Continuous self-tests ensure the function of the safety 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 countersunk taper for countersunk bolts

## TECHNICAL SPECIFICATIONS AND ORDER DESIGNATIONS, AZM40

Technical specifications	AZM40
<b>Holding force <math>F_{Zh}/F_{max}</math>:</b>	2,000 N/2,600 N
<b>Latching force:</b>	approx. 25 N
<b>Protection type:</b>	IP65
<b>Dimensions (W x H x D):</b>	40 x 119.5 x 20 mm
<b>Installation position:</b>	Any
<b>Enclosure material:</b>	Glass fibre reinforced thermoplastic, self-extinguishing/ light metal die cast
<b>Actuator material:</b>	Stainless steel/light metal die cast
<b>Supply voltage:</b>	24 V DC -15%/+10%
<b>Electrical connection:</b>	In-built plug M12, 8-pin
<b>Outputs</b>	1 diagnosis output, 2 safety outputs, all p-switching
<b>Diagnosis and status indication:</b>	LEDs (green, yellow, red) visible from three sides
<b>Safety consideration:</b>	ISO 13849-1, IEC 61508
- The locking function:	PL e/cat. 4/SIL 3
- The holding function:	PL d/cat. 2/SIL 2
<b>Registrations:</b>	In preparation: 

Interlock monitored	Actuator monitored	Standard coding	Individual coding, one-off teach-in -I1	Individual coding, reteach-in -I2	Diagnosis output	Enclosure with countersunk taper for countersunk bolts	Enclosure with flat screw-on surface for cylinder-head bolts	Type designation	Material no.
■		■			■	■		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
<b>Actuator with countersunk taper</b>								<b>AZM40-B1</b>	<b>103034199</b>
<b>Actuator with flat screw-on surface</b>								<b>AZM40-B1-PH</b>	<b>103037328</b>

# SAFE AND SECURE. FLEXIBLE. SMALL. THE BISTABLE SAFETY INTERLOCK AZM40

## SIMPLE, 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.



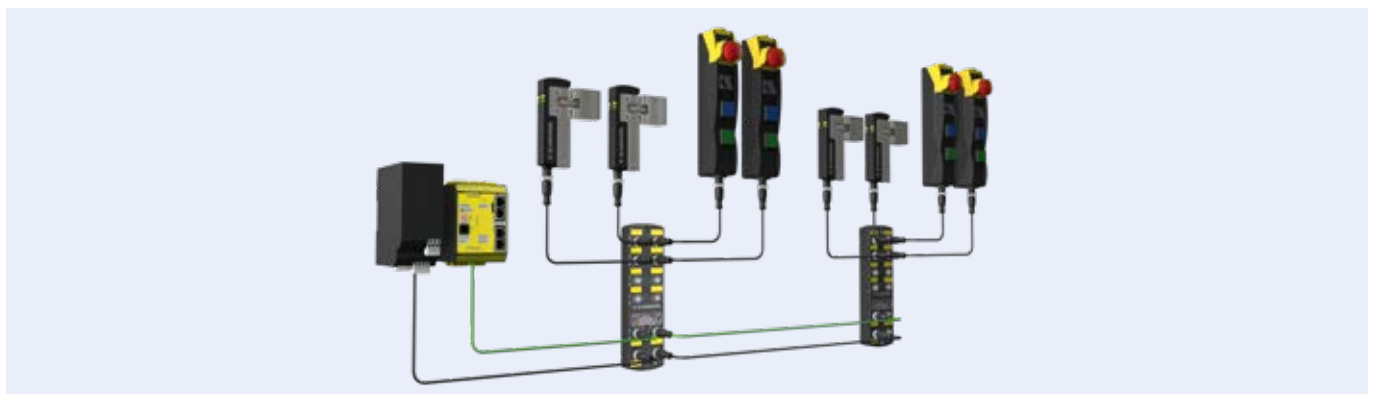
### SAFETY FIELDBOX SFB

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



### PASSIVE FIELDBOX PFB

- Passive installation system
- Series switching of safety switchgear
- Connect up to 4 safety switchgear units
- Individual protection of safety switchgear



Simple and flexible installation with the aid of the Safety Fieldbox.

## EVALUATION

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. In addition, the SRB-E-402FWS-TS module version also has the option of monitoring the contacts or outputs of a safety door monitoring system.

This module version prevents the safety door from being opened in the event of hazardous movement, and securely shuts down the movement with its second safety function – safety door monitoring. In addition, the fail-safe outputs prevent the machine from being started when the door is open.





# WIDE RANGE OF ACCESSORIES FOR INSTALLATION, ASSEMBLY AND EVALUATION

## ASSEMBLY

		Description	Type designation	Material no.
Door catch		<ul style="list-style-type: none"> <li>■ Door catch for pre-positioning</li> </ul>	External mounting: TFA-020	101172607
			Internal mounting: TFI-020	101172609

## INSTALLATION

		Description	Type designation	Material no.
Safety Fieldbox SFB		<ul style="list-style-type: none"> <li>■ Free linking of safety switchgear</li> <li>■ Connect up to 8 safety switchgear units</li> <li>■ PROFINET/PROFIsafe field bus interface to superior safety controller</li> <li>■ Diagnosis signals of all connected safety switchgear can be evaluated</li> </ul>	SFB-PN-IRT-8M12-IOP	103015478
Passive Fieldbox PFB		<ul style="list-style-type: none"> <li>■ Series switching of safety switchgear</li> <li>■ Connect up to 4 safety switchgear units</li> <li>■ Individual protection of safety switchgear</li> </ul>	PFB-IOP-4M12-IOP	103013573

Description	Length	Type designation	Material no.
Connection cable M12/8-pin with coupling	5.0 m	A-K8P-M12-S-G-5M-BK-1-X-A-4-69-VA	101210560
Connection cable M12/8-pin with coupling	10.0 m	A-K8P-M12-S-G-10M-BK-1-X-A-4-69-VA	103001389
Connection cable M12/8-pin with coupling	2.5 m	A-K8P-M12-S-G-2,5M-BK-2-X-A-4-69	103011415
Connection cable M12/8-pin with coupling	5.0 m	A-K8P-M12-S-G-5M-BK-2-X-A-4-69	103007358
Connection cable M12/8-pin with coupling	10.0 m	A-K8P-M12-S-G-10M-BK-2-X-A-4-69	103007359
Connection cable M12/8-pin with coupling	2.0 m	A-K8P-M12-S-W-2M-BK-2-X-A-2	101209969
Connection cable M12/8-pin with coupling	5.0 m	A-K8P-M12-S-W-5M-BK-1-X-A-4-69-VA	101210561

## EVALUATION

		Description	Type designation	Material no.
PROTECT SRB-E safety relay module		<ul style="list-style-type: none"> <li>■ STOP 0 function</li> <li>■ 1 or 2-channel actuation</li> <li>■ Start button/autostart</li> <li>■ 2 5.5 A safety outputs</li> <li>■ 1 signal output</li> </ul>	SRB-E-201ST	103008067
		<ul style="list-style-type: none"> <li>■ Standstill monitoring with 1 or 2 pulse generators</li> <li>■ Additional standstill signal</li> <li>■ 2-channel time monitoring</li> <li>■ 2-channel safety door monitoring</li> <li>■ 2 safety contacts</li> <li>■ 2 safety outputs</li> <li>■ 2 signal outputs</li> </ul>	SRB-E-402FWS-TS	103014757
PROTECT PSC1 safety controller		<ul style="list-style-type: none"> <li>■ Freely programmable</li> <li>■ 14 fail-safe inputs</li> <li>■ 4 fail-safe HL outputs</li> <li>■ 1 fail-safe relay path</li> <li>■ Modular expansion to 64 inputs/outputs</li> <li>■ Fail-safe axis monitoring in acc. with EN 61800-5-2 for 1 axis</li> <li>■ Fieldbus protocol (Profinet/Ethercat/EthernetIP) selectable via software</li> </ul>	PSC1-C-10-SDM1-FB1	103008445
		<ul style="list-style-type: none"> <li>■ Freely programmable</li> <li>■ 14 fail-safe inputs</li> <li>■ 20 switchable fail-safe inputs/outputs</li> <li>■ 4 fail-safe HL outputs</li> <li>■ 1 fail-safe relay path</li> <li>■ Modular expansion to 272 inputs/outputs</li> <li>■ Fail-safe axis monitoring in acc. with EN 61800-5-2 for up to 12 axes</li> <li>■ Universal communication module supports standard fieldbus systems with only one hardware</li> <li>■ Fieldbus protocol (Profinet/Ethercat/EthernetIP) selectable via software</li> <li>■ Fail-safe remote IO and master-master communication</li> </ul>	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 2000 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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