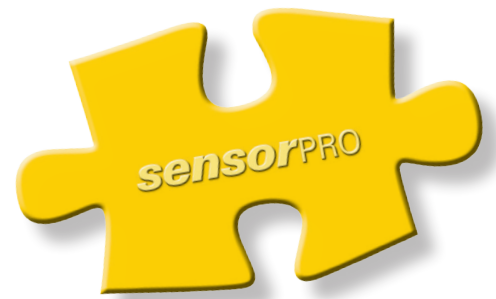*sensor* PRO

STS – Non-contact
safety switches with coding

sensor PRO —
safe signal acquisition

Safety light curtains
SLC Series

SLC series safety light curtains are ideally suited for implementing optoelectronic protective devices. The **SLC series** is thereby used to protect operators from dangerous areas or as an access control against unauthorized trespassing.

## Safety light grids
SLD Series

The **SLD series** safety light grids are optoelectronic personal protective devices for access protection to hazardous areas on machinery and equipment.

The two product families, **SLC** and **SLD,** offer an extensive range of items, uncomplicated connection technology and comprehensive additional functions for simple commissioning and fast diagnosis.

Light curtains + light grids
SLC + SLD Series

Emergency stop buttons
SNH Series
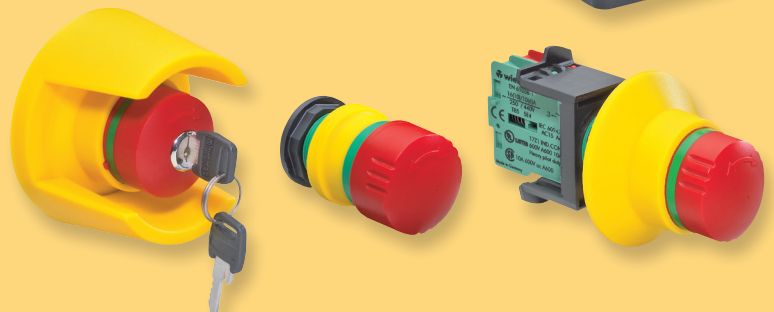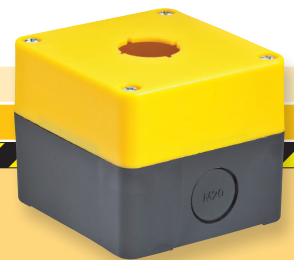
Emergency stop buttons
SNH Series

The emergency stop buttons of the **SNH series** provide for the safety of man and machine and offer users a practical, robust and reliable design.
The fast and easy installation of the emergency stop buttons saves time and money, and a long durability as well as reliable functionality is guaranteed through the use of high-quality materials.
The emergency stop buttons of the **SNH series** can be used in a wide range of applications across the various sectors.

Safety switch with guard locking
SIN Series

The safety switches in the **SIN series** are used to monitor the position of movable guards and prevent the accidental opening of safety doors or flaps with their integrated guard locking. They are typically used on machines with movements that occur after switching off, where it must be ensured that no person may gain access until the hazardous situation has ended.

Safety switch with separated actuator **SMS Series**

Safety switches in the **SMS series** are used to monitor movable guards. The safety switches are suitable for the protection of people and processes and are available in three different designs.

Non-contact safety switches
STS Series

The non-contact safety switches from the **STS series** feature maximum manipulation protection and are used for monitoring the position of machine parts and the position of doors and switches of isolating protective devices.

## Magnetic safety switches
SMA Series

The sensors of the **SMA series** are magnetic safety sensors which are used for the contact-less monitoring of protective doors and the detection of safe positions. In addition, they are equipped with integrated manipulation protection and can be used up to IP67.

Mechanical safety switches
SIN + SMS Series

Non-contact safety switches
STS + SMA Series
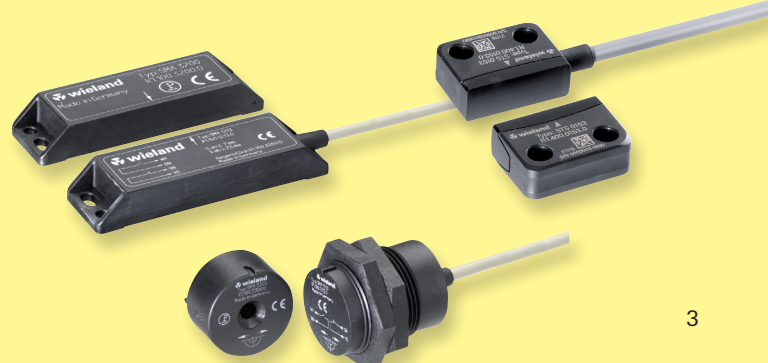
STS – Non-contact safety switches with coding

STS 01xx

STS 02xx

TÜV

Applications

- Protection of people or machines
- Position monitoring of machine parts
- Position monitoring of doors and switches of isolating protective devices

Features

- Individual coding for maximum manipulation protection
- Up to PL e / category 4 (EN 13849-1)
- Up to SIL_{CL} 3 (EN 62061)
- Up to 30 sensors can be cascaded
- Automatic or manual start
- LED and semiconductor output for diagnostics
- Switching distance of 8 mm / 10 mm
- Protection class IP67 / IP69K

Function

The non-contact safety switches from the STS series are used for monitoring the position of machine parts and the position of doors and switches of isolating protective devices.

The STS series features integrated evaluation and built-in manipulation protection.

In the event of a hazard, access is approved or the machine is shut down, for example, by a device from the **safe** RELAY series or the **samos**® / **samos**®PRO safety system or by the safety switch directly.

Safety switches from the STS series are also able to switch larger loads without wear via safe outputs (OSSDs).

Circuit diagram

Pin assignment

M12x1 8-polig
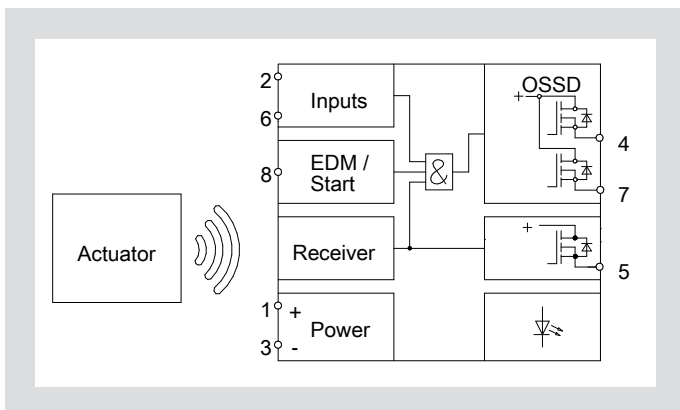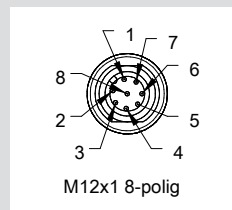
Connector

PIN	Colour	Function
1	BN	UB
2	WH	Safety input 1
3	BU	GND
4	BK	Safety output 1
5	GY	Diagnostic output
6	PK	Safety input 2
7	VT	Safety output 2
8	OG	EDM-start input

STS – Non-contact safety switches with coding

Tailor-made manipulation protection

Different applications require different solutions when it comes to existing manipulation protection.

Safety switches from the STS series have 3 different coding variations, which means that they can always offer the right solution.

Coded:
The safety switch accepts every STS actuator.

Fully coded:
The safety switch only accepts the programmed-in STS actuator.

Unique:
The safety switch only accepts STS actuator delivered with it. An STS actuator cannot be programmed in.

Diverse installation

The 5 actuation directions of the STS series and the maximum displacement between the actuator and switch element of 8 mm make installation easy even when the protective device to be monitored has large mechanical tolerances.

The resulting advantage is that it can be used universally on removable, rotatable, or sideways-moving protective devices.
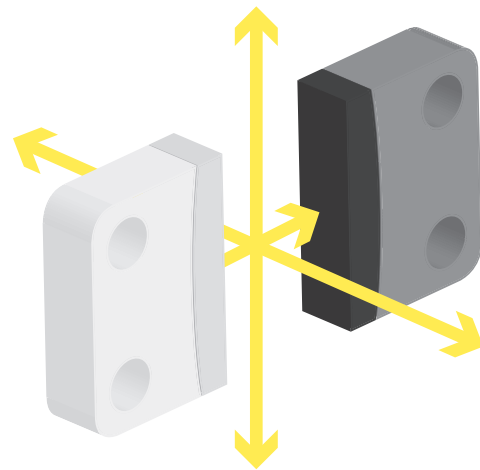
5 different actuation directions for universal use

Application
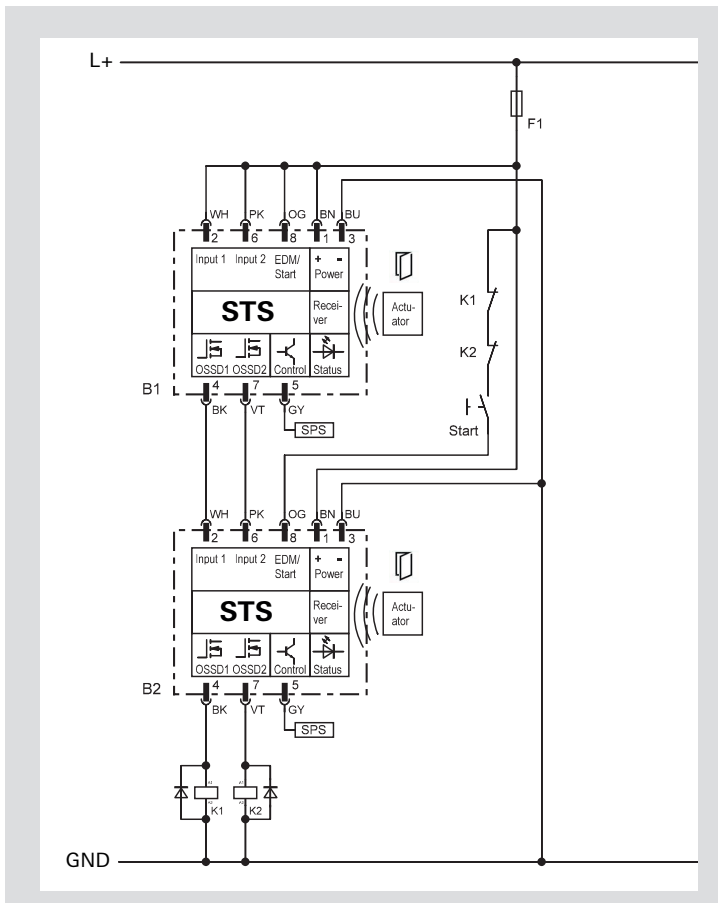
Serial wiring of 2 safety switches STS with manual start and EDM

5

STS – Non-contact safety switches with coding

Circuit diagram

STS 01xx

STS 02xx

Technical data

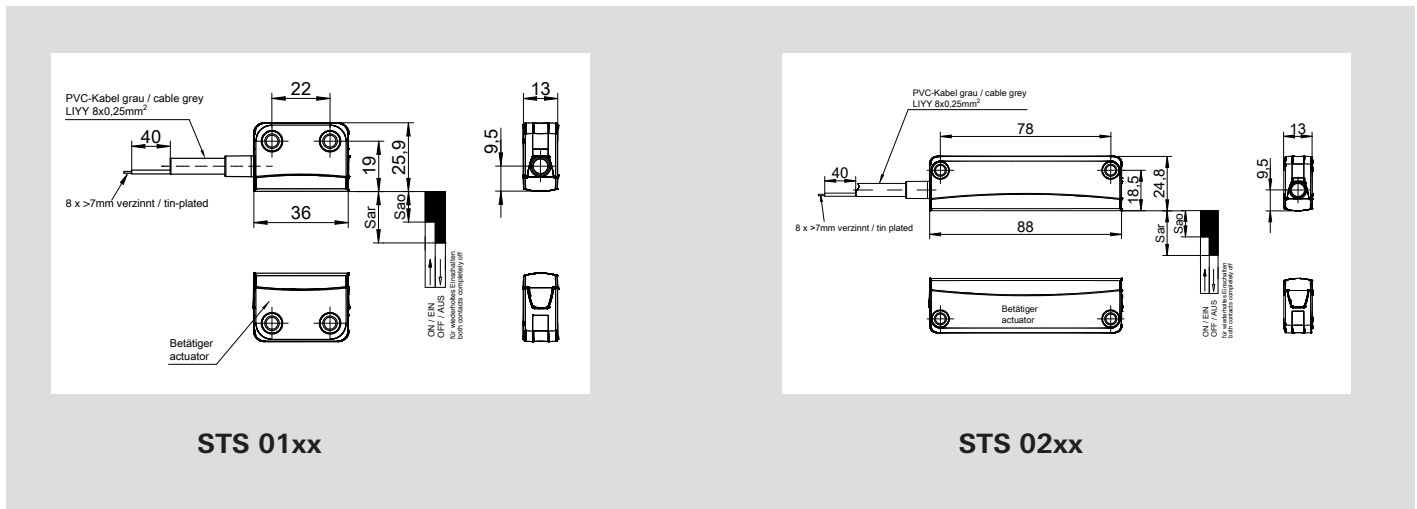| Function		Non-contact safety switch
Function display		LED, three-colored
Supply circuit		
Nominal voltage U_N		24 V DC
Operating voltage range U_B		$0.9 - 1.1 \times U_N$
Galvanic isolation supply circuit - output circuit		no
Control circuits		
Number of safety inputs		2
EDM/start input		1
Input current, max.		2 mA
Output circuits		
Number	OSSD	2
	Diagnostics	1
Short-circuit monitoring		yes
Switching current, max.	OSSD	400 mA
	Diagnostics	50 mA
Switching voltage, max.		UB - 0.2 V
Series connection		max. 30 sensors
Switching behavior		
Switching distance / (Sao / Sar)	STS 01xx	8 mm / 18 mm
	STS 02xx	10 mm / 18 mm
Hysteresis		2 mm
Actuator displacement, max.		8 mm
Actuation directions		Operator definable
Switching frequency		3 Hz
General data		
Creepage distances and clearances between the circuits		EN 60664-1
Protection class as per EN 60529		IP67
Operating ambient temperature		-25 ºC - +70 ºC
Connection		M12 (8 pole) / cable (8 pole)
Standards		EN ISO 13849-1, EN 62061
Certificates / Approvals		TÜV, cULus

STS – Non-contact safety switches with coding

Overview of devices | part numbers

Type	Description	Coding	Part no.	Std. pack
STS 0110	Switch-set, automatic start, connection M12-8	coded	R1.400.0110.0	1
STS 0113	Switch-set, automatic start, connection cable 3m	coded	R1.400.0113.0	1
STS 0114	Switch-set, automatic start, connection cable 5m	coded	R1.400.0114.0	1
STS 0116	Switch-set, automatic start, connection cable 10m	coded	R1.400.0116.0	1
STS 0130	Switch-set, automatic start, connection M12-8	fully-coded	R1.400.0130.0	1
STS 0133	Switch-set, automatic start, connection cable 3m	fully-coded	R1.400.0133.0	1
STS 0134	Switch-set, automatic start, connection cable 5m	fully-coded	R1.400.0134.0	1
STS 0136	Switch-set, automatic start, connection cable 10m	fully-coded	R1.400.0136.0	1
STS 0150	Switch-set, automatic start, connection M12-8	unique	R1.400.0150.0	1
STS 0153	Switch-set, automatic start, connection cable 3m	unique	R1.400.0153.0	1
STS 0154	Switch-set, automatic start, connection cable 5m	unique	R1.400.0154.0	1
STS 0156	Switch-set, automatic start, connection cable 10m	unique	R1.400.0156.0	1
STS 0120	Switch-set, manual start, connection M12-8	coded	R1.400.0120.0	1
STS 0123	Switch-set, manual start, connection cable 3m	coded	R1.400.0123.0	1
STS 0124	Switch-set, manual start, connection cable 5m	coded	R1.400.0124.0	1
STS 0126	Switch-set, manual start, connection cable 10m	coded	R1.400.0126.0	1
STS 0140	Switch-set, manual start, connection M12-8	fully-coded	R1.400.0140.0	1
STS 0143	Switch-set, manual start, connection cable 3m	fully-coded	R1.400.0143.0	1
STS 0144	Switch-set, manual start, connection cable 5m	fully-coded	R1.400.0144.0	1
STS 0146	Switch-set, manual start, connection cable 10m	fully-coded	R1.400.0146.0	1
STS 0160	Switch-set, manual start, connection M12-8	unique	R1.400.0160.0	1
STS 0163	Switch-set, manual start, connection cable 3m	unique	R1.400.0163.0	1
STS 0164	Switch-set, manual start, connection cable 5m	unique	R1.400.0164.0	1
STS 0166	Switch-set, manual start, connection cable 10m	unique	R1.400.0166.0	1
STS 0210	Switch-set, automatic start, connection M12-8	coded	R1.400.0210.0	1
STS 0213	Switch-set, automatic start, connection cable 3m	coded	R1.400.0213.0	1
STS 0214	Switch-set, automatic start, connection cable 5m	coded	R1.400.0214.0	1
STS 0216	Switch-set, automatic start, connection cable 10m	coded	R1.400.0216.0	1
STS 0230	Switch-set, automatic start, connection M12-8	fully-coded	R1.400.0230.0	1
STS 0233	Switch-set, automatic start, connection cable 3m	fully-coded	R1.400.0233.0	1
STS 0234	Switch-set, automatic start, connection cable 5m	fully-coded	R1.400.0234.0	1
STS 0236	Switch-set, automatic start, connection cable 10m	fully-coded	R1.400.0236.0	1
STS 0250	Switch-set, automatic start, connection M12-8	unique	R1.400.0250.0	1
STS 0253	Switch-set, automatic start, connection cable 3m	unique	R1.400.0253.0	1
STS 0254	Switch-set, automatic start, connection cable 5m	unique	R1.400.0254.0	1
STS 0256	Switch-set, automatic start, connection cable 10m	unique	R1.400.0256.0	1
STS 0220	Switch-set, manual start, connection M12-8	coded	R1.400.0220.0	1
STS 0223	Switch-set, manual start, connection cable 3m	coded	R1.400.0223.0	1
STS 0224	Switch-set, manual start, connection cable 5m	coded	R1.400.0224.0	1
STS 0226	Switch-set, manual start, connection cable 10m	coded	R1.400.0226.0	1
STS 0240	Switch-set, manual start, connection M12-8	fully-coded	R1.400.0240.0	1
STS 0243	Switch-set, manual start, connection cable 3m	fully-coded	R1.400.0243.0	1
STS 0244	Switch-set, manual start, connection cable 5m	fully-coded	R1.400.0244.0	1
STS 0246	Switch-set, manual start, connection cable 10m	fully-coded	R1.400.0246.0	1
STS 0260	Switch-set, manual start, connection M12-8	unique	R1.400.0260.0	1
STS 0263	Switch-set, manual start, connection cable 3m	unique	R1.400.0263.0	1
STS 0264	Switch-set, manual start, connection cable 5m	unique	R1.400.0264.0	1
STS 0266	Switch-set, manual start, connection cable 10m	unique	R1.400.0266.0	1
STS 3110	Actuator for STS 011x, 012x, 013x, 014x		R1.400.3110.0	1
STS 3210	Actuator for STS 021x, 022x, 023x, 024x		R1.400.3210.0	1

Note: Suitable M12 cables (SLX-CAB) can be selected on page 86 of the **safety**-catalog (0860.1)

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