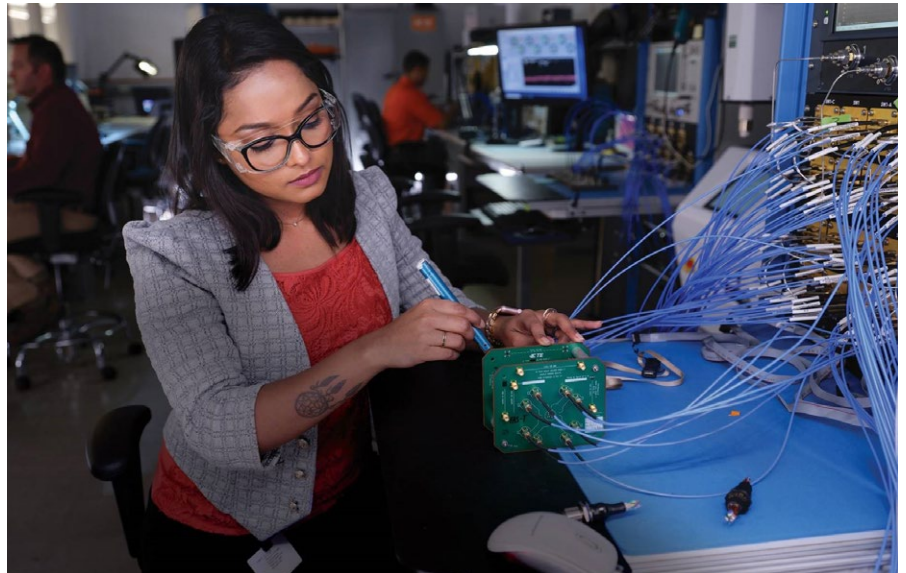


SAFETY LIGHT CURTAINS

SLC Range

- Type 2 & 4 light curtains relays
- Cables
- Columns
- Deflecting mirrors
- Brackets
- Accessories





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Deflecting mirrors

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Brackets

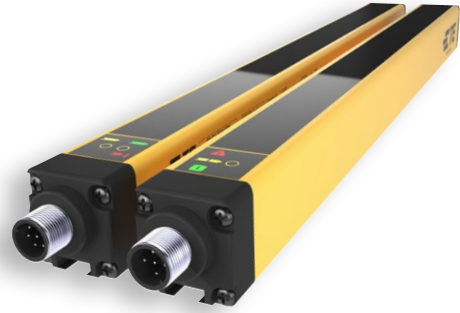
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Accessories

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Safety light curtains

Overview



ONE SIMPLE PRODUCT RANGE TO COVER MOST OF TODAY'S INDUSTRIAL APPLICATIONS

Safety light curtain (SLC) product range is compact with competitive performance and innovative features. Includes models with integrated safety functions, including self-monitoring of static outputs, control of external contactors (EDM) and selectable automatic/manual restart. 2 safety PNP static outputs. Easy connection and installation thanks to the M12 connectors and the use of unshielded cables.

RELIABLE AND COMPACT

High ingress protection ratings

IP67 and IP65 offer high protection against dirt, dust, sand, water, projections and other liquids with IP67 and IP65 ratings. High resistance to infiltration by dust and liquids in a highly compact light curtain.

Compact size

SLC is one of the smallest light curtains on the market (with all integrated safety functions).
With a minimal cross section:
28 x 30 mm.

Robustness

Thanks to powder-coated aluminum casing SLC range can obtain high level of reliability. Excellent also in cold storage facilities with -30°C to +55°C operating temperature.

SAFE AND SMART

No blind area

Thanks to the position of the 1st beam on the connector side, the protected area extends until the light curtain end maintaining the resolution.

Fast, simple installation

Plug and play thanks to the M12 connectors and the use of unshielded cables. No programming necessary. Easy to install and replace.

User-friendly diagnostics via LEDs

Status indicating display with alignment aids are helping the user to diagnose the status.

HIGH LEVEL OF PRODUCTIVITY AND SAFETY

High safety

Type 2 and Type 4 light curtains approved in accordance with:

- EN IEC 61496-1/-2
- ANSI / UL 1998

Finger, hand and body protection

From safety light barriers for body protection to the safety light curtain for finger protection and hand protection, the product series SLC4 and SLC2 cover the large portfolio.

A range adapted to your needs

Integrated safety functions, including self-monitoring of static outputs, control of external contactors (EDM) and selectable automatic/manual restart, helps for increased productivity due to reduced downtimes.

Safety light curtains

Features

SLC4 - SLC2 Range

Noteworthy features and a comprehensive range

SLC range is a compact light curtain range with competitive performance and innovative features. Includes models with integrated safety functions, including self-monitoring of static outputs, control of external contactors (EDM) and selectable automatic/manual restart.

2 safety PNP static outputs. Easy connection and installation thanks to the M12 connectors and the use of unshielded cables up to 100 m.

Aluminum casing

Powder-coated

-30 to +55 °C

Operating temperature

Excellent also in cold storage facilities

Protected height
up to 2,2 meters

Caps

Glass reinforced
polypropylene

Zero-Dead-Zone

On one side of
the curtain

**Finger, hand and body detection
and multi-beam for access control**
One of the most comprehensive
range in today's market

Compact size

Only 30 x 28 mm

IP65 and IP67

Status indicating display

Including alignment aids

Hardware configuration

- No programming necessary
- Easy to install and replace

M12 connectors

Cables easy to source and replace
No shielded cables needed

Safety light curtains

Main Features

SLC4 - SLC2 Range

Noteworthy features and a comprehensive range

MAIN FEATURES

- **Minimal cross section:** 28 x 30 mm
- **Start-up time:** ≤ 2 sec
- **No blind area on one side**
The position of first beam helps ensure that the sensitive area extends to end of the light curtain.
The protected area extends until the light curtain end, maintaining the resolution.

STANDARDS



-30 to +55°C operating temperature for all models with operating range up to 12 m.

-20 to +55°C operating temperature for H models (operating range up to 20 m) and 14 mm resolution models.



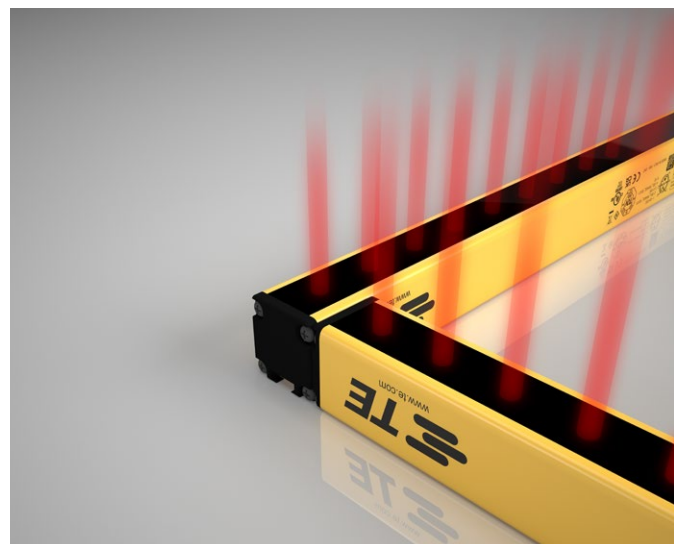
IP65

IP65 and IP67 protection rate.

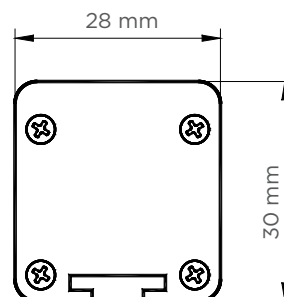


IP67

Special versions resistant to vibrations and shocks.



DIMENSIONS (mm)



Safety light curtains

Certifications

SLC4 – SLC2 Range compliance

Certifications	SLC4	SLC2
2006/42/EC: “Machine Directive”	●	●
2014/30/EU: “Electromagnetic Compatibility Directive”	●	●
2014/35/EU: “Low Voltage Directive”	●	●
EN 61496-1:2013 “Safety of machinery - Electro sensitive protective equipment - General requirements and tests”	● (Type 4)	● (Type 2)
EN 61496-2:2013 “Safety of machinery - Electro sensitive protective equipment - Particular requirements for equipment using active opto-electronic protective devices (AOPDs)”	● (Type 4)	● (Type 2)
IEC 61508-1 (ed. 2) “Functional safety of electrical/electronic programmable electronic safety related systems: General requirements”	● (SIL 3)	● (SIL 1)
IEC 61508-2 (ed. 2) “Functional safety of electrical/electronic/programmable electronic safety related systems: Requirements for electrical/electronic/programmable electronic safety-related systems”	● (SIL 3)	● (SIL 1)
IEC 61508-3 (ed. 2) “Functional safety of electrical/electronic programmable electronic safety related systems: Software requirements”	● (SIL 3)	● (SIL 1)
IEC 61508-4 (ed. 2) “Functional safety of electrical/electronic programmable electronic safety related systems: Definitions and abbreviations”	● (SIL 3)	● (SIL 1)
IEC 62061:2005/A2:2015 “Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems”	● (SILCL 3)	● (SILCL 1)
EN ISO 13849-1:2015 “Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design”	● (Cat. 4, PL e)	● (Cat. 2, PL c)
EN 50178:1997 “Electronic equipment for use in power installations”	●	●
EN 55022:2006 “Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement”	●	●
EN 60068-2-6:2009 “Environmental testing Part 2-6: Tests - Test Fc: Vibration (sinusoidal)”	●	●
UL (C+US) mark for USA and Canada	●	●
ANSI / UL 1998: “Safety Software in Programmable Components”	●	●

SAFETY PARAMETERS FOR TYPE 2 LIGHT CURTAINS

With the publication of Edition 3 of the harmonized EN 61496-1 standard it is no longer possible to use a Type 2 safety light curtains for safety functions assessed as SIL 2 / PL d.

If a safety level of SIL 2 / PL d (or higher) is required and it is nevertheless intended to use a safety light curtain, then it will be necessary to use a Type 4 safety light curtain. This regulatory requirement derives from the fact that the reduction of risk that can be obtained via a photoelectric safety light curtain is not only a function of the safety level of its electronic parts, but is also determined by its systematic capabilities (for example: environmental influences, EMC, optical performance and detection principle).

The systematic capability of a Type 2 photoelectric light curtain may in fact not be sufficient to help ensure adequate risk reduction for SIL 2 / PL d applications.

The standard also establishes that the labelling of Type 2 safety light curtains must indicate such limitation to SIL 1 / PL c. The PFHd values declared for the electronic control part of the device, on the other hand, are not limited and therefore it is possible to use the PFHd value provided by the manufacturer of the device in the global assessment of the safety function, even if it exceeds the SIL 1 / PL c range.

Safety light curtains

Application example



Safety light curtains

SLC4 Range

SLC4 Range with built-in control functions

FEATURES

- Selectable manual/automatic Start/Restart.
- Resolution: 14, 20, 30, 40, 50, 90 mm
- Access control: 2, 3, 4 beams
- Safety outputs: 2
- Selectable operating range: 0 to 4 m - low range/0 to 12 m
- high range 14 mm resolution models: 0 to 3 m
- low range / 1 to 6 m - high range
- Integrated feedback input for external device monitoring (EDM)
- Electrical connections and setting adjustments through M12 5-pole connector for emitter, M12 8-pole connector for receiver
- Unshielded cables up to 100 meters long can be used to connect the light curtain.
- Protected heights: 160 mm to 2260 mm

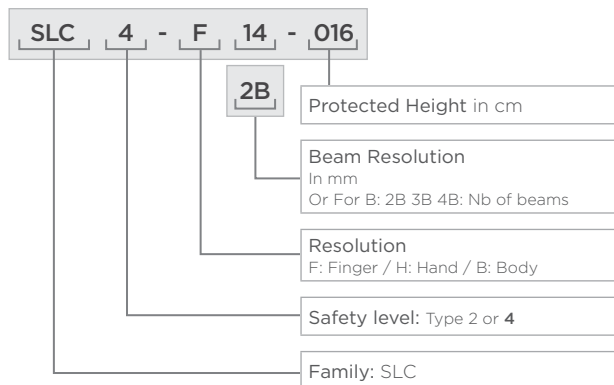
COMPATIBLE CABLES

- Emitter: M12 5-pole (SLC-FC5-M12-5P, SLC-FC10-M12-5P, SLC-FC15-M12-5P...) See page 18-19
- Receiver: M12 8-pole (SLC-FC5-M12-8P, SLC-FC10-M12-8P, SLC-FC15-M12-8P...) See page 18-19

ACCESSORIES

- Safety relay. See SRS4-2NO & SRS4M-2NO page 16-17
- Support columns. See page 20-22
- Deflecting mirrors. See page 23
- Laser alignment device. See page 25
- Vibration dampers. See page 25
- Brackets. See page 24

PART TYPE SYSTEM



SAFETY LEVEL

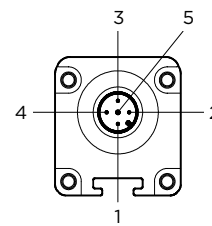
TYPE 4
SIL 3 - SILCL 3 | PL e - Cat. 4

APPROVALS



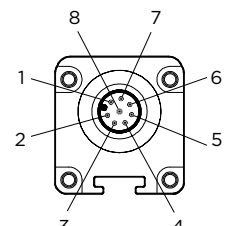
CONNECTORS

Emitter:
M12 5-pole



- 1 - 24 VDC
- 2 - RANGE 0
- 3 - 0 VDC
- 4 - RANGE 1
- 5 - PE

Receiver:
M12 8-pole



- 1 - OSSD 1
- 2 - 24 VDC
- 3 - OSSD 2
- 4 - K1 K2 / RESTART
- 5 - SEL A
- 6 - SEL B
- 7 - 0 VDC
- 8 - PE

Safety light curtains

SLC4 Range



Technical features

- Max. range (m):
 - Selectable 3 to 6 m for 14 mm resolution models
 - Selectable 4 to 12 m for all other models
 - Selectable 10 to 20 m for L versions
- Response time: 2,5 to 20 ms
- Safety outputs: 2 PNP - 400 mA at 24 VDC with short-circuit, overload, polarity reversal protection
- Status display: LEDs for light curtain's status and diagnostic
- Power supply (VDC) : 24 ± 20%
- Fastening: Via back slot with provided standard brackets or at the top and lower end with optional rotating brackets. See accessories

Ordering information



FINGER resolution
Max. range: selectable 3 to 6 m



HAND resolution - Max. range: selectable 4 to 12 m
L versions - Max. range: selectable 10 to 20 m

Protected height (mm)	Overall height (mm)	Resolution 14 mm			Resolution 20 mm			Resolution 30 mm		
		Nb of beam	Type	Part Number	Nb of beam	Type	Part Number	Nb of beam	Type	Part Number
160	213	15	SLC4-F14-016	2437979-1	15	SLC4-H20-016L	2447901-1	8	SLC4-H30-016	2446038-1
260	313	25	SLC4-F14-026	2437979-2	-	-	-	13	SLC4-H30-016L	2447902-1
310	363	30	SLC4-F14-031	2437979-3	30	SLC4-H20-031L	2447901-3	16	SLC4-H30-026	2446038-2
460	513	45	SLC4-F14-046	2437979-4	45	SLC4-H20-031L	2447901-3	23	SLC4-H30-031	2446038-3
610	663	60	SLC4-F14-061	2437979-6	60	SLC4-H20-046L	2447901-4	31	SLC4-H30-031L	2447902-3
760	813	75	SLC4-F14-076	2437979-7	75	SLC4-H20-046L	2447901-4	31	SLC4-H30-046	2446038-4
910	963	90	SLC4-F14-091	2437979-9	90	SLC4-H20-061L	2447901-6	31	SLC4-H30-046L	2447902-4
1060	1113	105	SLC4-F14-106	1-2437979-0	105	SLC4-H20-061L	2447901-6	53	SLC4-H30-061	2446038-6
1210	1263	120	SLC4-F14-121	1-2437979-2	120	SLC4-H20-061L	2447901-6	53	SLC4-H30-061L	2447902-6
1360	1413	135	SLC4-F14-136	1-2437979-3	135	SLC4-H20-076L	2447901-7	61	SLC4-H30-076	2446038-7
1510	1563	150	SLC4-F14-151	1-2437979-5	150	SLC4-H20-076L	2447901-7	61	SLC4-H30-076L	2447902-7
1660	1713	165	SLC4-F14-166	1-2437979-6	165	SLC4-H20-091L	2447901-9	46	SLC4-H30-091	2446038-9
1810	1863	180	SLC4-F14-181	1-2437979-8	180	SLC4-H20-091L	2447901-9	46	SLC4-H30-091L	1-2447902-0
1960	2013	195	SLC4-F14-196	1-2437979-9	195	SLC4-H20-106L	1-2447901-0	53	SLC4-H30-106	1-2446038-0
2110	2163	-	-	-	120	SLC4-H20-106L	1-2447901-0	61	SLC4-H30-106L	1-2447902-1
2260	2313	-	-	-	135	SLC4-H20-121L	1-2447901-2	61	SLC4-H30-121	1-2446038-2
					135	SLC4-H20-121L	1-2447901-2	68	SLC4-H30-121L	1-2447902-2
					150	SLC4-H20-136L	1-2447901-3	68	SLC4-H30-136	1-2446038-3
					150	SLC4-H20-136L	1-2447901-3	76	SLC4-H30-136L	1-2447902-3
					150	SLC4-H20-151L	1-2447901-5	76	SLC4-H30-151	1-2446038-5
					165	SLC4-H20-151L	1-2447901-5	83	SLC4-H30-151L	1-2447902-5
					165	SLC4-H20-166L	1-2447901-6	83	SLC4-H30-166	1-2446038-6
					180	SLC4-H20-166L	1-2447901-6	91	SLC4-H30-166L	1-2447902-6
					180	SLC4-H20-181L	1-2447901-8	91	SLC4-H30-181	1-2446038-8
					195	SLC4-H20-181L	1-2447901-8	98	SLC4-H30-181L	1-2447902-8
					195	SLC4-H20-196L	1-2447901-9	98	SLC4-H30-196	1-2446038-9
					-	SLC4-H20-196L	1-2447901-9	106	SLC4-H30-196L	1-2447902-9
					-	-	-	106	SLC4-H30-211	2-2446038-1
					-	-	-	106	SLC4-H30-211L	2-2447902-1
					-	-	-	113	SLC4-H30-226	2-2446038-2
					-	-	-	113	SLC4-H30-226L	2-2447902-2

PACKING

1 piece per box (1 emitter and 1 receiver)

Safety light curtains

SLC4 Range



BODY resolution - Max. range: selectable 4 to 12 m
L versions - Max. range: selectable 10 to 20 m

Resolution 40 mm				Resolution 50 mm				Resolution 90 mm			
Nb of beam	Type	Part Number		Nb of beam	Type	Part Number		Nb of beam	Type	Part Number	
6	SLC4-H40-016	2447896-1		4	SLC4-B50-016	2447897-1		-	-	-	
	SLC4-H40-016L	2447903-4			SLC4-B50-016L	2447904-1		-	-	-	
9	SLC4-H40-026	2447896-2		-	-	-		-	-	-	
	-	-		-	-	-		-	-	-	
11	SLC4-H40-031	2447896-3		8	SLC4-B50-031	2447897-3		4	SLC4-B90-031	2447899-3	
	SLC4-H40-031L	2447903-3			SLC4-B50-031L	2447904-3			SLC4-B90-031L	2447905-3	
16	SLC4-H40-046	2447896-4		12	SLC4-B50-046	2447897-4		6	SLC4-B90-046	2447899-4	
	SLC4-H40-046L	2447903-4			SLC4-B50-046L	2447904-4			SLC4-B90-046L	2447905-4	
21	SLC4-H40-061	2447896-6		16	SLC4-B50-061	2447897-6		8	SLC4-B90-061	2447899-6	
	SLC4-H40-061L	2447903-6			SLC4-B50-061L	2447904-6			SLC4-B90-061L	2447905-6	
26	SLC4-H40-076	2447896-7		20	SLC4-B50-076	2447897-7		10	SLC4-B90-076	2447899-7	
	SLC4-H40-076L	2447903-7			SLC4-B50-076L	2447904-7			SLC4-B90-076L	2447905-7	
31	SLC4-H40-091	2447896-9		24	SLC4-B50-091	2447897-9		12	SLC4-B90-091	2447899-9	
	SLC4-H40-091L	2447903-9			SLC4-B50-091L	2447904-9			SLC4-B90-091L	2447905-9	
36	SLC4-H40-106	1-2447896-0		28	SLC4-B50-106	1-2447897-0		14	SLC4-B90-106	1-2447899-0	
	SLC4-H40-106L	1-2447903-0			SLC4-B50-106L	1-2447904-0			SLC4-B90-106L	1-2447905-0	
41	SLC4-H40-121	1-2447896-2		32	SLC4-B50-121	1-2447897-2		16	SLC4-B90-121	1-2447899-2	
	SLC4-H40-121L	1-2447903-2			SLC4-B50-121L	1-2447904-2			SLC4-B90-121L	1-2447905-2	
46	SLC4-H40-136	1-2447896-3		36	SLC4-B50-136	1-2447897-3		18	SLC4-B90-136	1-2447899-3	
	SLC4-H40-136L	1-2447903-3			SLC4-B50-136L	1-2447904-3			SLC4-B90-136L	1-2447905-3	
51	SLC4-H40-151	1-2447896-5		40	SLC4-B50-151	1-2447897-5		20	SLC4-B90-151	1-2447899-5	
	SLC4-H40-151L	1-2447903-5			SLC4-B50-151L	1-2447904-5			SLC4-B90-151L	1-2447905-5	
56	SLC4-H40-166	1-2447896-6		44	SLC4-B50-166	1-2447897-6		22	SLC4-B90-166	1-2447899-6	
	SLC4-H40-166L	1-2447903-6			SLC4-B50-166L	1-2447904-6			SLC4-B90-166L	1-2447905-6	
61	SLC4-H40-181	1-2447896-8		48	SLC4-B50-181	1-2447897-8		24	SLC4-B90-181	1-2447899-8	
	SLC4-H40-181L	1-2447903-8			SLC4-B50-181L	1-2447904-8			SLC4-B90-181L	1-2447905-8	
66	SLC4-H40-196	1-2447896-9		52	SLC4-B50-196	1-2447897-9		26	SLC4-B90-196	1-2447899-9	
	SLC4-H40-196L	1-2447903-9			SLC4-B50-196L	1-2447904-9			SLC4-B90-196L	1-2447905-9	
71	SLC4-H40-211	2-2447896-1		56	SLC4-B50-211	2-2447897-1		28	SLC4-B90-211	2-2447899-1	
	SLC4-H40-211L	2-2447903-1			SLC4-B50-211L	2-2447904-1			SLC4-B90-211L	2-2447905-1	
76	SLC4-H40-226	2-2447896-2		60	SLC4-B50-226	2-2447897-2		30	SLC4-B90-226	2-2447899-2	
	SLC4-H40-226L	2-2447903-2			SLC4-B50-226L	2-2447904-2			SLC4-B90-226L	2-2447905-2	



ACCESS CONTROL - Max. range: selectable 4 to 12 m
L versions - Max. range: selectable 10 to 20 m - 2, 3 or 4 beams

Protected height (mm)	Overall height (mm)	Resolution 20 mm			
		Nb of beam	Beam spacing (mm)	Type	Part Number
510	653	2	500	SLC4-B2B-051	2447900-5
				SLC4-B2B-051L	2447906-5
810	953	3	400	SLC4-B3B-081	2447900-8
				SLC4-B3B-081L	2447906-8
910	1053	4	300	SLC4-B4B-091	2447900-9
				SLC4-B4B-091L	2447906-9

Safety light curtains

SLC2 Range

SLC2 Range with built-in control functions

FEATURES

- Selectable manual/automatic Start/Restart.
- Resolution: 30, 40, 50, 90 mm
- Access control: 2, 3, 4 beams
- Safety outputs: 2
- Integrated feedback input for external device monitoring (EDM)
- Electrical connections and setting adjustments through M12 5-pole connector for emitter, M12 8-pole connector for receiver
- Unshielded cables up to 100 meters long can be used to connect the light curtain.
- Protected heights: 160 mm to 2260 mm

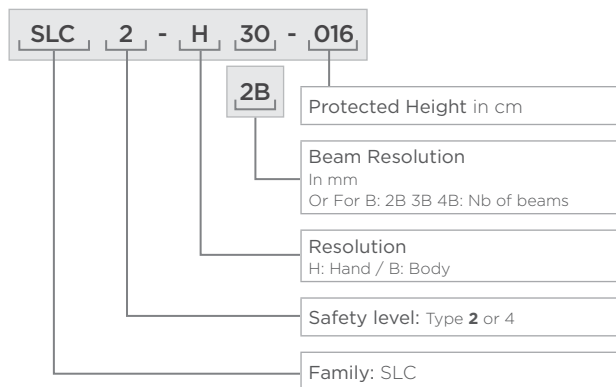
COMPATIBLE CABLES

- Emitter: M12 5-pole (SLC-FC5-M12-5P, SLC-FC10-M12-5P, SLC-FC15-M12-5P...) See page 18-19
- Receiver: M12 8-pole (SLC-FC5-M12-8P, SLC-FC10-M12-8P, SLC-FC15-M12-8P...) See page 18-19

ACCESSORIES

- Safety relay. See SRS4-2NO & SRS4M-2NO page 16-17
- Support columns. See page 20-22
- Deflecting mirrors. See page 23
- Laser alignment device. See page 25
- Vibration dampers. See page 25
- Brackets. See page 24

PART TYPE SYSTEM



SAFETY LEVEL

TYPE 2
SIL 1 - SILCL 1 | PL c - Cat. 2

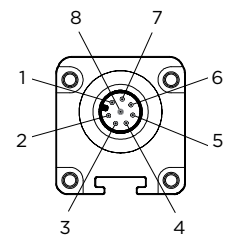
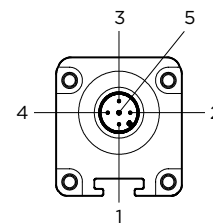
APPROVALS



CONNECTORS

Emitter:
M12 5-pole

Receiver:
M12 8-pole

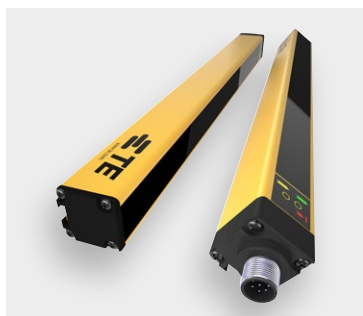


- 1 - 24 VDC
- 2 - RANGE 0
- 3 - 0 VDC
- 4 - RANGE 1
- 5 - PE

- 1 - OSSD 1
- 2 - 24 VDC
- 3 - OSSD 2
- 4 - K1 K2 / RESTART
- 5 - SEL A
- 6 - SEL B
- 7 - 0 VDC
- 8 - PE

Safety light curtains

SLC2 Range



Technical features

- Max. range (m): 4 or 12 m
- Response time: 2,5 to 18,5 ms
- Safety outputs: 2 PNP - 400 mA at 24 VDC with short-circuit, overload, polarity reversal protection
- Status display: LEDs for light curtain's status and diagnostic
- Power supply (VDC): 24 ± 20%
- Fastening: Via back slot with provided standard brackets or at the top and lower end with optional rotating brackets. See accessories.

Ordering information



HAND resolution

Max. range: selectable 12 m

Protected height (mm)	Overall height (mm)	Resolution 30 mm			Resolution 40 mm		
		Nb of beam	Type	Part Number	Nb of beam	Type	Part Number
160	213	8	SLC2-H30-016	2447907-1	6	SLC2-H40-016	2447908-1
260	313	13	SLC2-H30-026	2447907-2	8	SLC2-H40-026	2447908-2
310	363	16	SLC2-H30-031	2447907-3	11	SLC2-H40-031	2447908-3
460	513	23	SLC2-H30-046	2447907-4	16	SLC2-H40-046	2447908-4
610	663	31	SLC2-H30-061	2447907-6	21	SLC2-H40-061	2447908-6
760	813	38	SLC2-H30-076	2447907-7	26	SLC2-H40-076	2447908-7
910	963	46	SLC2-H30-091	2447907-9	31	SLC2-H40-091	2447908-9
1060	1113	53	SLC2-H30-106	1-2447907-0	36	SLC2-H40-106	1-2447908-0
1210	1263	61	SLC2-H30-121	1-2447907-2	41	SLC2-H40-121	1-2447908-2
1360	1413	68	SLC2-H30-136	1-2447907-3	46	SLC2-H40-136	1-2447908-3
1510	1563	76	SLC2-H30-151	1-2447907-5	51	SLC2-H40-151	1-2447908-5
1660	1713	83	SLC2-H30-166	1-2447907-6	56	SLC2-H40-166	1-2447908-6
1810	1863	91	SLC2-H30-181	1-2447907-8	61	SLC2-H40-181	1-2447908-8
1960	2013	98	SLC2-H30-196	1-2447907-9	66	SLC2-H40-196	1-2447908-9
2110	2163	106	SLC2-H30-211	2-2447907-1	71	SLC2-H40-211	2-2447908-1
2260	2313	113	SLC2-H30-226	2-2447907-2	76	SLC2-H40-226	2-2447908-2



BODY resolution - F versions

Max. range: selectable 12 m

Protected height (mm)	Overall height (mm)	Resolution 50 mm			Resolution 90 mm		
		Nb of beam	Type	Part Number	Nb of beam	Type	Part Number
160	213	4	SLC2-B50-016	2447909-1	-	-	-
310	363	8	SLC2-B50-031	2447909-3	4	SLC2-B90-031	2447910-3
460	513	12	SLC2-B50-046	2447909-4	6	SLC2-B90-046	2447910-4
610	663	16	SLC2-B50-061	2447909-6	8	SLC2-B90-061	2447910-6
760	813	20	SLC2-B50-076	2447909-7	10	SLC2-B90-076	2447910-7
910	963	24	SLC2-B50-091	2447909-9	12	SLC2-B90-091	2447910-9
1060	1113	28	SLC2-B50-106	1-2447909-0	14	SLC2-B90-106	1-2447910-0
1210	1263	32	SLC2-B50-121	1-2447909-2	16	SLC2-B90-121	1-2447910-2
1360	1413	36	SLC2-B50-136	1-2447909-3	18	SLC2-B90-136	1-2447910-3
1510	1563	40	SLC2-B50-151	1-2447909-5	20	SLC2-B90-151	1-2447910-5
1660	1713	44	SLC2-B50-166	1-2447909-6	22	SLC2-B90-166	1-2447910-6
1810	1863	48	SLC2-B50-181	1-2447909-8	24	SLC2-B90-181	1-2447910-8
1960	2013	52	SLC2-B50-196	1-2447909-9	26	SLC2-B90-196	1-2447910-9
2110	2163	56	SLC2-B50-211	2-2447909-1	28	SLC2-B90-211	2-2447910-1
2260	2313	60	SLC2-B50-226	2-2447909-2	30	SLC2-B90-226	2-2447910-2



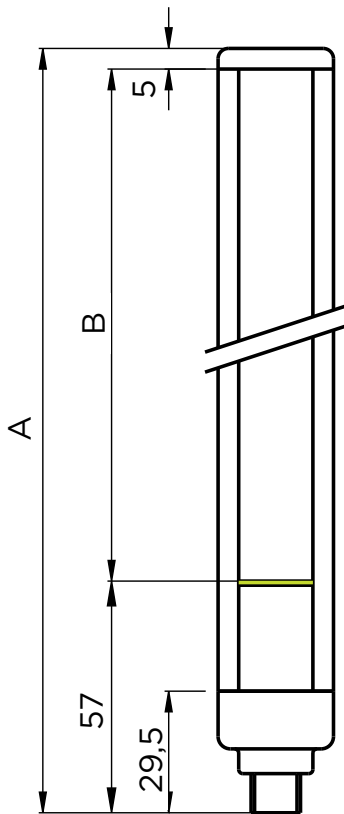
ACCESS CONTROL F versions

Max. range: selectable 12 m - 2, 3 or 4 beams

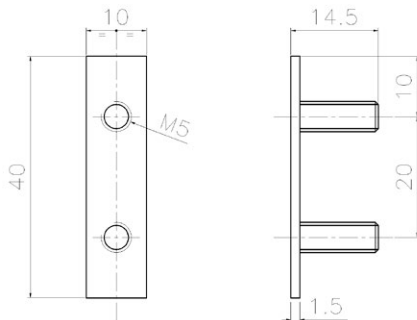
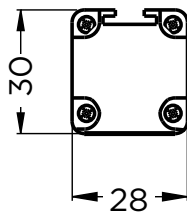
Protected height (mm)	Overall height (mm)	Resolution 20 mm			
		Nb of beam	Beam spacing (mm)	Type	Part Number
510	653	2	500	SLC2-B2B-051	2447911-5
810	953	3	400	SLC2-B3B-081	2447911-8
910	1053	4	300	SLC2-B4B-091	2447911-9

PACKING 1 piece per box (1 emitter and 1 receiver)

SLC2 - SLC4 Emitter and receiver

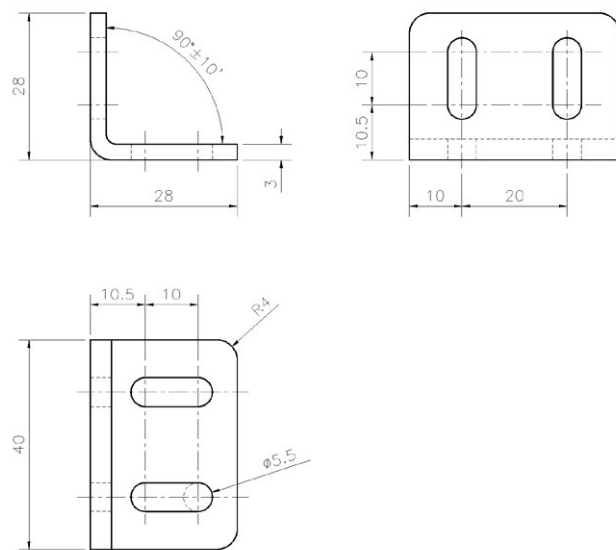


Emitter - Receiver
Standard model



Model	A (mm)	B (mm)	Mounting
2B	653	590	Set of 4 essential brackets included
3B	953	890	
4B	1053	990	
150	213	150	
250	313	250	
300	363	300	
450	513	450	
600	663	600	Set of 6 essential brackets included
750	813	750	
900	963	900	
1050	1113	1050	
1200	1263	1200	Set of 6 essential brackets included
1350	1413	1350	
1500	1563	1500	
1650	1713	1650	
1800	1863	1800	
1950	2013	1950	
2100	2163	2100	
2250	2313	2250	

DIMENSIONS (mm)



Inserts and essential fastening brackets (provided in the box).

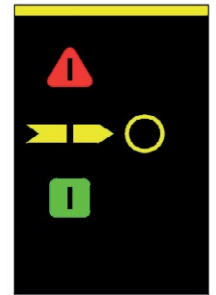
Safety light curtains

Display

SLC2 - SLC4 Status display

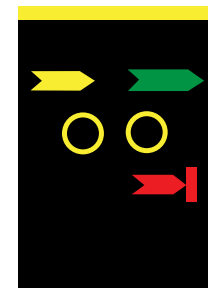
Emitter - All models

Three colour LED	Meaning
	System power-on - Initial TEST
	System power-on - HIGH working range selected
	FAIL condition - The type of fault is identified by the number of flashes - See technical manual
	TEST condition
	Normal operating condition



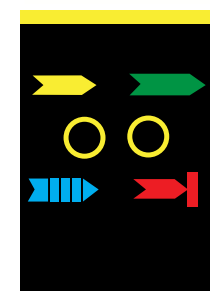
Receiver - All models except SLC4 14 mm and L (range 20 m) versions

1 - Yellow LED	2 - Two colour LED	Meaning
		System power-on - Initial TEST
		BREAK condition
		CLEAR condition - SLC4 (with integrated control functions) only
		BREAK_K condition - SLC4 (with integrated control functions) only
		GUARD condition
		FAIL condition - The type of fault is identified by the number of flashes - See technical manual



Receiver - SLC4 14 mm and L (range 20 m) versions

1 - Two colour LED	2 - Two colour LED	Meaning
		System power-on - Initial TEST
		BREAK condition
		CLEAR condition - SLC4 (with integrated control functions) only
		BREAK_K condition - SLC4 (with integrated control functions) only
		GUARD condition
		FAIL condition - The type of fault is identified by the number of flashes - See technical manual
		GUARD condition with weak signal
		CLEAR condition with weak signal
		BREAK condition with weak signal
		BREAK_K condition with weak signal - SLC4 (with integrated control functions) only



Safety light curtains

Compatible interfaces

SRS4-2NO

Type 4 interface for OSSD output devices

FEATURES

Safety interface module for safety light curtains SLC4 and SLC2.

- Guided-contact safety relays
- Start/Restart interlock
- EDM feedback input for extra external contactors monitoring

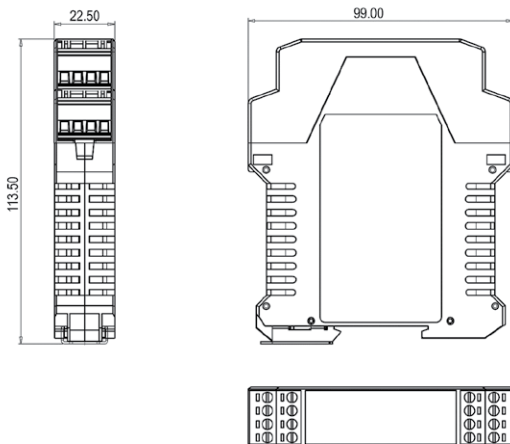
ORDERING INFORMATION

Description	Type	Part Number	Pkg
TYPE 4 INTERFACE FOR OSSD OUTPUT DEVICES	SRS4- 2NO	2447935-1	1

MAIN TECHNICAL DATA

Safety relay outputs	2 NO - 6 A 250 VAC
Status output	PNP - 100 mA at 24 VDC
Response time (ms)	≤ 20
Start/Restart command according to IEC 61496-1	Automatic/Manual monitored selectable
Status display	LEDs indication of power on, connected light curtains status and fault diagnosis
Power supply (VDC)	24 ± 20%
Electrical connections	On terminal blocks
Operating temperature (°C)	-30°C to +55°C
Protection rating	IP20 for housing IP2X for terminal blocks
Fastening	DIN rail fastening according to EN 50022-35 standard
Dimensions h x w x d (mm)	99 x 22,5 x 114

DIMENSIONS (mm)



SAFETY LEVEL

TYPE 4

SILCL 3 | PL e - Cat. 4

APPROVALS



Safety light curtains

Compatible interfaces

SRS4M-2NO Type 4 safety interface with muting

FEATURES

Safety interface module for safety light curtains SLC4 and SLC2 with integrated muting function.

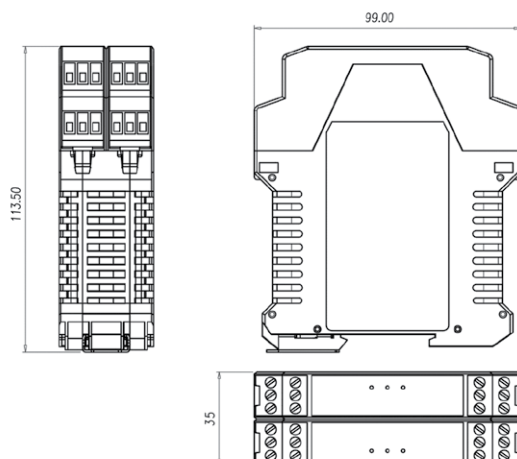
- 2 inputs for muting sensors
- Inputs for the connection of one safety light curtain with failure reduced outputs
- Guided contact safety relays
- Start/Restart interlock
- EDM feedback input for extra external contactors monitoring
- Muting time-out selectable
- Integrated override with 2 operating modes selectable
- Muting enable input

ORDERING INFORMATION

Description	Type	Part Number	Pkg
TYPE 4 SAFETY INTERFACE WITH MUTING	SRS4M-2NO	2447935-3	1

MAIN TECHNICAL DATA

Muting logic	L (One way) logic with 2 sensors - Crossed beams
Muting time-out	Selectable : 30 sec. or infinite
Muting inputs	2 inputs 24 VDC - PNP or Relay - Dark-on
Status display	LED indication of input/output status, Muting sensor inputs, diagnosis
Safety relay outputs	2 NO - 6 A 250 VAC
Status output	PNP - 0 mA at 24 VDC
Response time (ms)	≤ 20
Start/Restart command according to IEC 61496-1	Automatic/Manual monitored selectable
Power supply (VDC)	24 ± 20%
Electrical connections	On terminal blocks
Operating temperature (°C)	-30 to +55°C
Protection rating	IP20 for housing / IP2X for terminal blocks
Fastening	DIN rail fastening according to EN 50022-35 standard
Dimensions h x w x d (mm)	99 x 35 x 114



SAFETY LEVEL

TYPE 4

SILCL 3 | PL e - Cat. 4

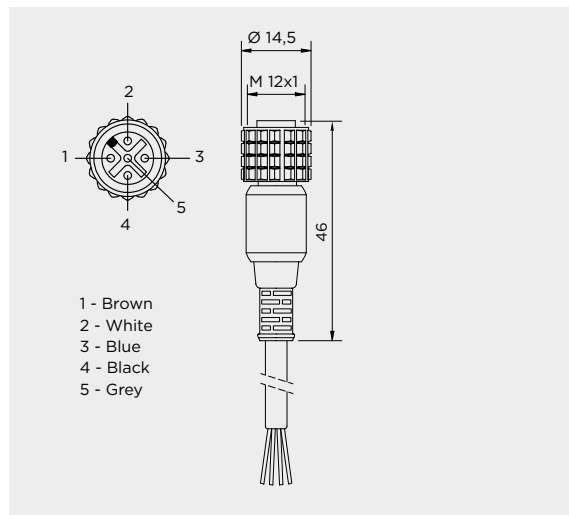
APPROVALS



Safety light curtains

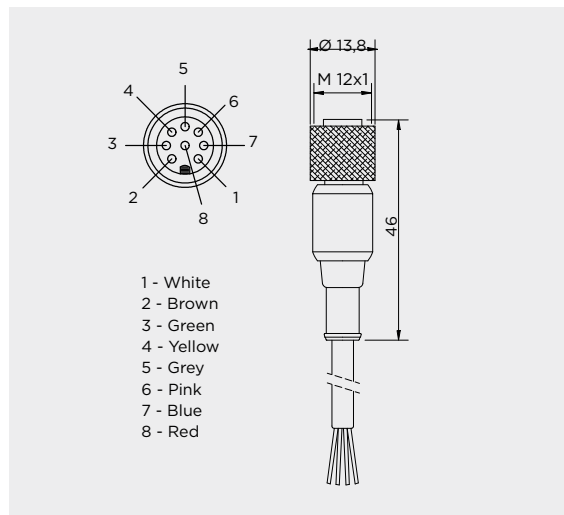
Cables

CONNECTORS



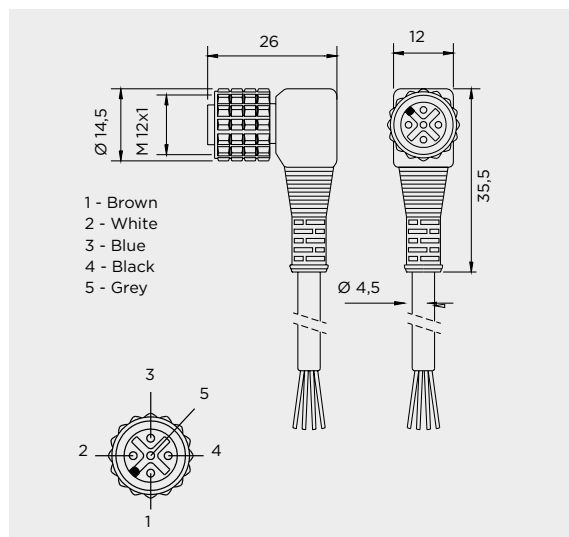
M12 female straight connector 5-pole

Description	Type	Part Number	Pkg
Pre-wired cable 5 m	SLC-FC5-M12-5P	2447912-1	1
Pre-wired cable 10 m	SLC-FC10-M12-5P	2447912-2	1
Pre-wired cable 15 m	SLC-FC15-M12-5P	2447912-3	1
Pre-wired cable 20 m	SLC-FC20-M12-5P	2447912-4	1
Pre-wired cable 25 m	SLC-FC25-M12-5P	2447912-5	1
Pre-wired cable 40m	SLC-FC40-M12-5P	2447912-6	1
Pre-wired cable 50 m	SLC-FC50-M12-5P	2447912-7	1



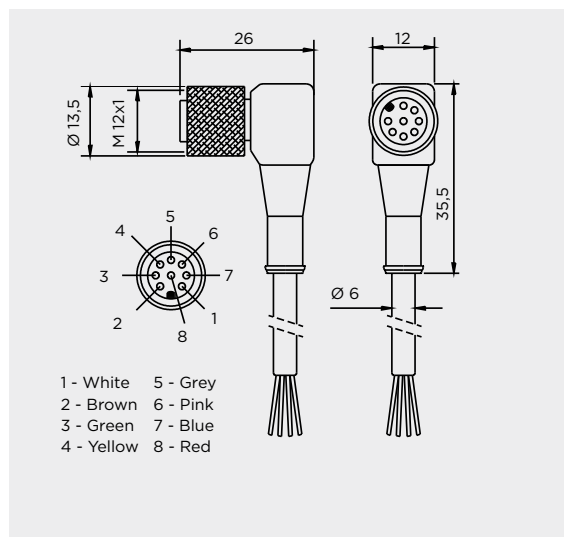
M12 female straight connector 8-pole

Description	Type	Part Number	Pkg
Pre-wired cable 5 m	SLC-FC5-M12-8P	2447913-1	1
Pre-wired cable 10 m	SLC-FC10-M12-8P	2447913-2	1
Pre-wired cable 15 m	SLC-FC15-M12-8P	2447913-3	1
Pre-wired cable 20 m	SLC-FC20-M12-8P	2447913-4	1
Pre-wired cable 25 m	SLC-FC25-M12-8P	2447913-5	1
Pre-wired cable 40m	SLC-FC40-M12-8P	2447913-6	1
Pre-wired cable 50 m	SLC-FC50-M12-8P	2447913-7	1



M12 female 90° angle connector 5-pole

Description	Type	Part Number	Pkg
Pre-wired cable 5 m	SLC-FC5-M12-90-5P	2447912-8	1
Pre-wired cable 10 m	SLC-FC10-M12-90-5P	2447912-9	1
Pre-wired cable 15 m	SLC-FC15-M12-90-5P	1-2447912-0	1



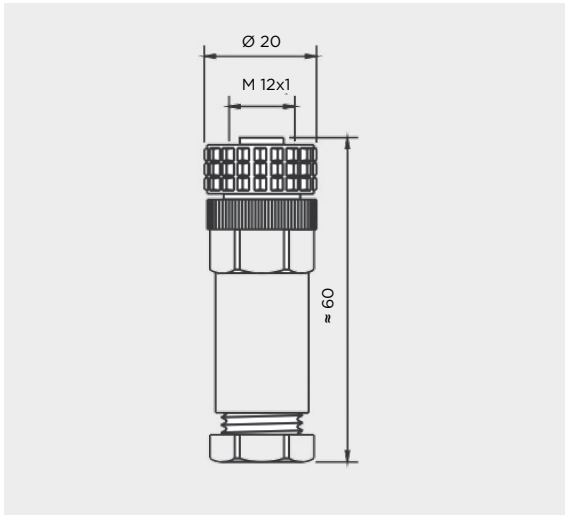
M12 female 90° angle connector 8-pole

Description	Type	Part Number	Pkg
Pre-wired cable 5 m	SLC-FC5-M12-90-5P	2447913-8	1
Pre-wired cable 10 m	SLC-FC10-M12-90-5P	2447913-9	1
Pre-wired cable 15 m	SLC-FC15-M12-90-5P	1-2447913-0	1

Dimensions in mm

Safety light curtains

Cables

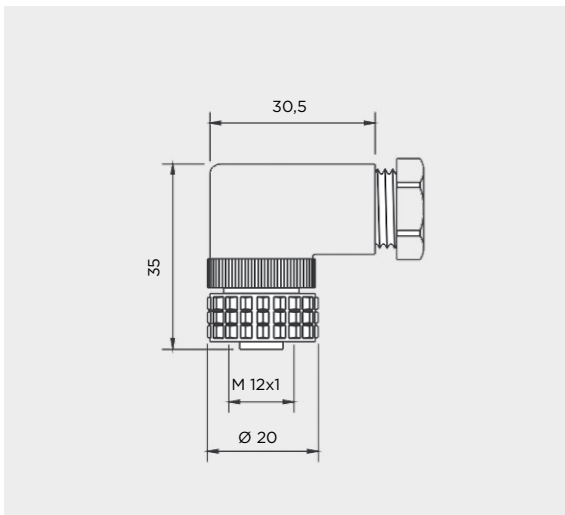


M12 female straight connector 5-pole screw terminal, PG9 cable gland

Description	Type	Part Number	Pkg
M12 Straight connector 5 pole PG9 cable gland	SLC-FC-M12-5P-CG9	1-2447912-1	1

M12 female straight connector 8-pole screw terminal, PG9 cable gland

Description	Type	Part Number	Pkg
M12 Straight connector 8 pole PG9 cable gland	SLC-FC-M12-8P-CG9	1-2447913-3	1

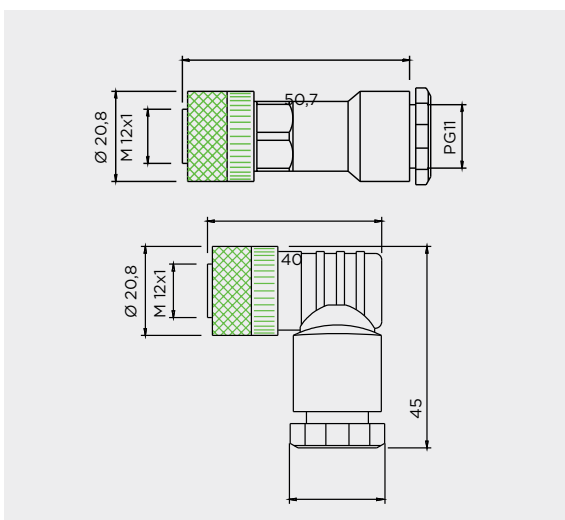


M12 female 90° angle connector 5-pole screw terminal, PG9 cable gland

Description	Type	Part Number	Pkg
M12 Angled (90°) connector 5 pole PG9 cable gland	SLC-FC-M12-90-5P-CG9	1-2447912-2	1

M12 female 90° angle connector 8-pole screw terminal, PG9 cable gland

Description	Type	Part Number	Pkg
M12 Angled (90°) connector 8 pole PG9 cable gland	SLC-FC-M12-90-8P-CG9	1-2447913-4	1



M12 female straight connector 8-pole screw terminal, PG11 cable gland

Description	Type	Part Number	Pkg
M12 straight connector 8 pole PG11 cable gland	SLC-FC-M12-8P-CG11	1-2447913-1	1

M12 female 90° angle connector 8-pole screw terminal, PG11 cable gland

Description	Type	Part Number	Pkg
M12 Angled (90°) connector 8 pole PG11 cable gland	SLC-FC-M12-90-8P-CG11	1-2447913-2	1

Dimensions in mm

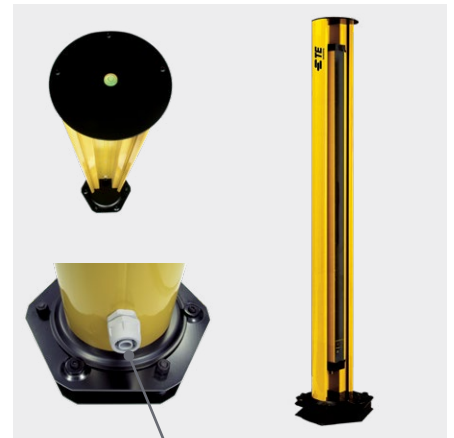
Safety light curtains

Columns

SLC-FMC/ SLC-FMC-CG11 Floor support columns for light curtains

FEATURES

- Support columns for SLC safety light curtains, designed to provide more secure fastening to the floor, fast installation, and a simple and precise adjustment of the optical alignment of the system.
- Columns made by aluminium extrusion poles, with adjustable angular orientation. Easy assembling and disassembling of the light curtain with easy adjustment of the first beam's height.
- Built-in spirit level for a correct positioning of the vertical axis.
- Steel base with springs for a highly reliable adjustment of the column vertical axis.
- Steel foundation inserts included with the product.
- SLC-FM...CG11... models for light curtains complete with PG11 rear union for light curtain cable sheath



PG11 cable gland
SLC-FM...CG11... Models

ORDERING INFORMATION

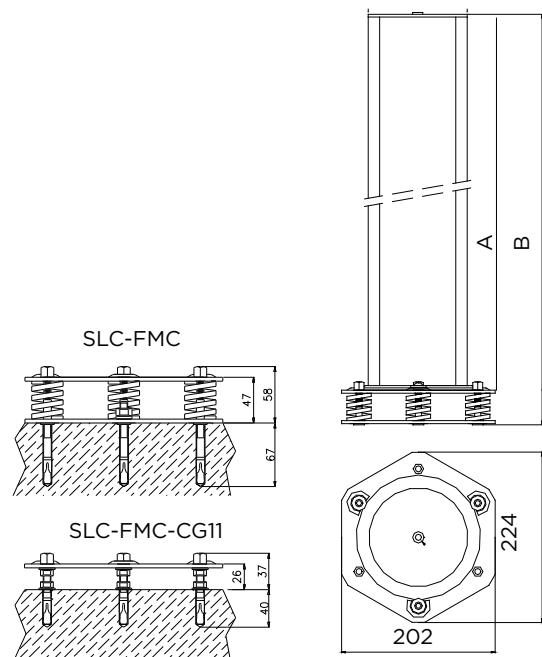
Columns

A height (mm)	B Overall height with FMC CB base (mm)	B Overall height with FMC CBL base (mm)	SLC-FMC models			SLC-FMC-CG11 models with PG11 rear union for cable sheath		
			Type	Part Number	Pkg per box	Type	Part Number	Pkg per box
1000	1055	1037	SLC-FMC2-100	2447915-1	1	SLC-FMC2-CG11-100	2447915-7	1
1200	1255	1237	SLC-FMC4-120	2447915-2	1	SLC-FMC2-CG11-120	2447915-8	1
1670	1725	1707	SLC-FMC-167	2447915-3	1	SLC-FMC2-CG11-167	2447915-9	1
1970	2025	2007	SLC-FMC-197	2447915-4	1	SLC-FMC2-CG11-197	1-2447915-0	1
2100	2155	2137	SLC-FMC-210	2447915-5	1			
2400	2455	2437	SLC-FMC-240	2447915-6	1			

Bases for columns

A height (mm)	Description	Type	Part Number	Pkg per box
55	Base for column	SLC-MB	2447918-1	1
37	Base for column with reduced height	SLC-MBS	2447918-2	1

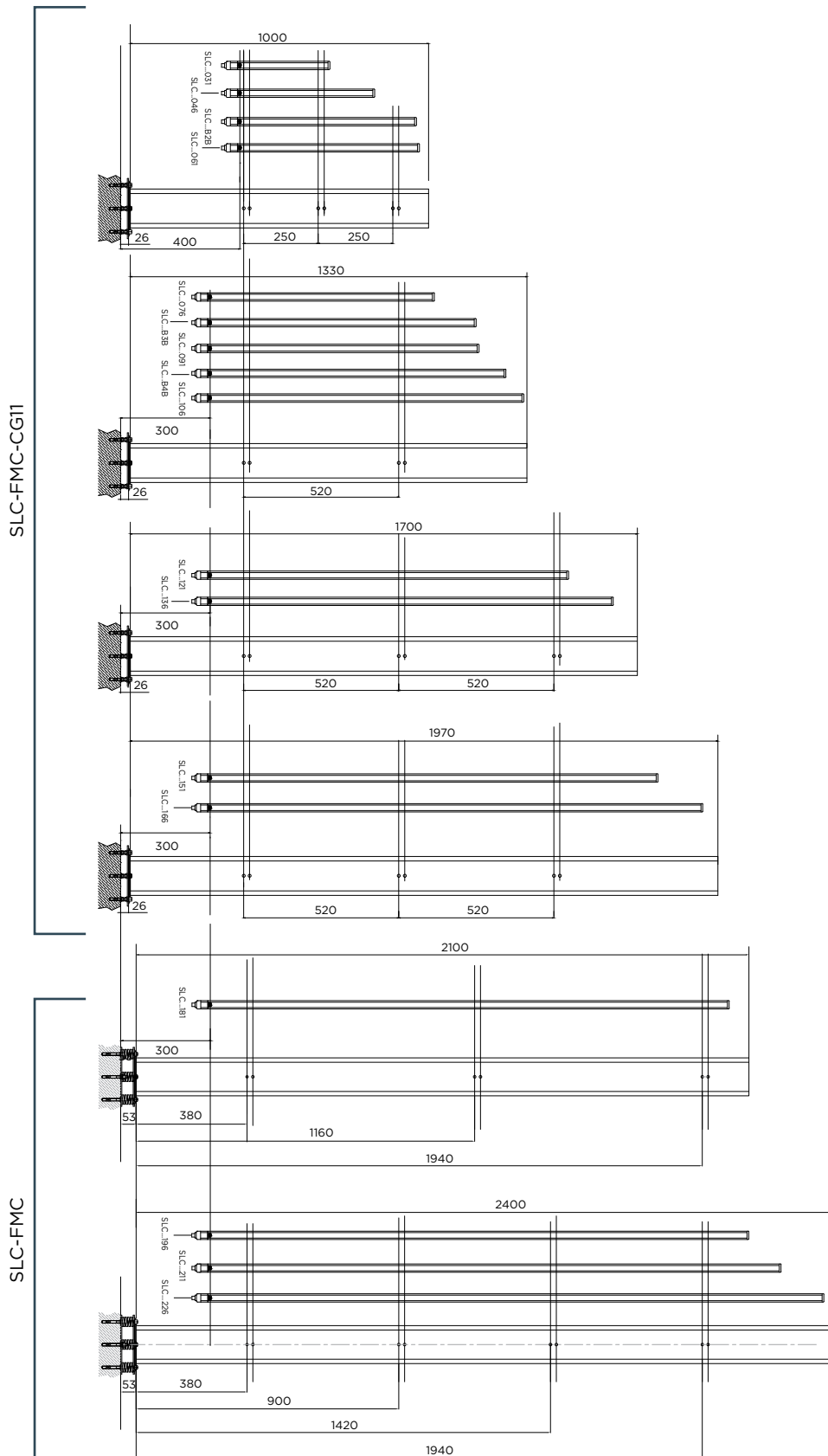
DRAWING



A: column height
B: column height with base SLC-FMC or SLC-FMC-CG11

DIMENSIONS (mm)

Light curtains - Columns correspondance



Safety light curtains

Columns

SLC-FMC2-DM/SLC-FMC2-ADM Columns with deflecting mirror

FEATURES

- Support columns with deflecting mirrors, designed to provide more secure fastening to the floor, fast installation, and a simple and precise adjustment of the optical alignment of the system.
- SLC-FMC2-DM models with pre-assembled deflecting mirrors, allow perimeter protections of up to 4 sides.
- SLC-FMC2-ADM models with pre-installed independent adjustable deflecting mirrors for safety light grids with 2, 3 and 4 beams. For applications with multiple sides and/or with a large protected perimeter the use of these models is recommended
- Optical power reduction factor: 15% for each mirror.
- Special models equipped with mirror with protective anti-fragmentation film available on request.



SLC-FMC2-DM / SLC-FMC2-ADM

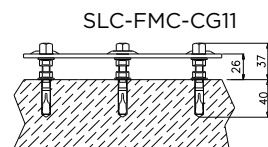
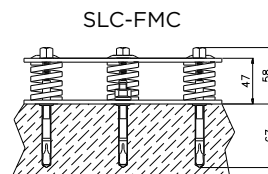
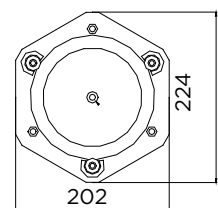
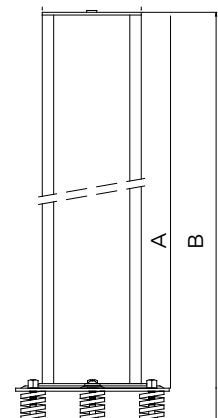
ORDERING INFORMATION

Columns

A - height (mm)	B - Overall height with SLC-FMC base (mm)	B - Overall height with SLC-FMC-CG11 base (mm)	Description	Type	Part Number	Pkg per box
1000	1055	1037	Single mirror for 2 beams, controlled height up to 700 mm light curtains	SLC-FMC2-DM-100	2447916-1	1
1200	1255	1237	Single mirror for 3 beams, controlled height up to 900 mm light curtains	SLC-FMC2-DM-120	2447916-2	1
1330	1385	1367	Single mirror for 4 beams, controlled height up to 900 mm light curtains	SLC-FMC2-DM-133	2447916-3	1
1670	1725	1707	Single mirror for controlled height up to 1360 mm	SLC-FMC2-DM-167	2447916-4	1
1970	2025	2007	Single mirror for controlled height up to 1660 mm	SLC-FMC2-DM-197	2447916-5	1
2180	2235	2217	Single mirror for controlled height up to 1800 mm	SLC-FMC2-DM-217	2447916-6	1

A - height (mm)	B - Overall height with SLC-FMC base (mm)	B - Overall height with SLC-FMC-CG11 base (mm)	Description	Type	Part Number	Pkg per box
1000	1055	1037	2 mirrors for 2 beams light curtains	SLC-FMC2-ADM-100	2447916-7	1
1200	1255	1237	3 mirrors for 3 beams light curtains	SLC-FMC2-ADM-120	2447916-8	1
1330	1385	1367	4 mirrors for 4 beams light curtains	SLC-FMC2-ADM-133	2447916-9	1

DIMENSIONS* (mm)



A: column height
B: column height with base SLC-FMC or SLC-FMC-CG11

(*) The column part number does not include the base which must be ordered separately (SLC models).

Safety light curtains

Mirrors

SLC-SLC-MP Deflecting mirror

FEATURES

- The SLC-SLC-MP deflecting mirrors allow to create perimeter protection of areas with access points on multiple sides, with a considerable reduction of costs.
- This solution significantly reduces the need to use multiple safety light curtains allowing perimeter protection of up to 4 sides.
- Section bar: extruded aluminium
- Mirror pre-fitted with heights: 250 to 1900 mm
- Angular orientation: adjustable using supplied brackets
- Optical power reduction factor: 15% (for each mirror)



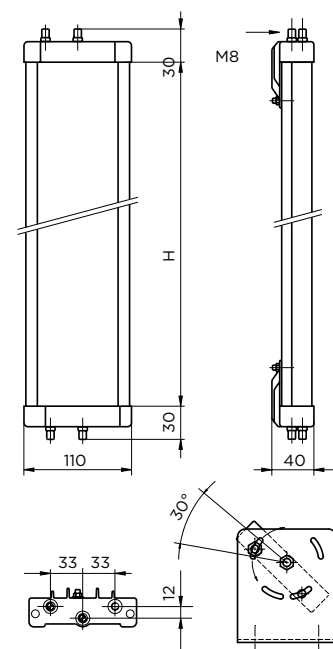
ORDERING INFORMATION

Height H in picture (mm)	For light curtains with protected height (mm)	For light grids with	Description	Type	Part Number	Pkg per box
250	160	-	Deflecting mirror for light curtains	SLC-SLC-MP-016	2447917-1	1
370	250	-		SLC-SLC-MP-025	2447917-2	1
400	310	-		SLC-SLC-MP-031	2447917-3	1
540	460	-		SLC-SLC-MP-046	2447917-4	1
715	610	2 beams		SLC-SLC-MP-061	2447917-5	1
885	760	-		SLC-SLC-MP-076	2447917-6	1
1065	910	3 beams		SLC-SLC-MP-091	2447917-7	1
1230	1060	4 beams		SLC-SLC-MP-106	2447917-8	1
1400	1210	-		SLC-SLC-MP-121	2447917-9	1
1450	1360	-		SLC-SLC-MP-136	1-2447917-0	1
1570	1440	-		SLC-SLC-MP-144	1-2447917-1	1
1600	1510	-		SLC-SLC-MP-151	1-2447917-2	1
1750	1660	-		SLC-SLC-MP-166	1-2447917-3	1
1900	1810	-		SLC-SLC-MP-181	1-2447917-4	1

The following rules should be taken into consideration when using deflecting mirrors:

- Total working distance (range) given by the sum of the lengths of all sides giving access to the protected area
- Each mirror used will decrease the maximum working range between the Emitter and the Receiver by 15%
- In order to help ensure compliance mirrors must be placed at the minimum safety distance on each side from the danger zone
- The use of the SLC laser alignment device is recommended for a quick and reliable alignment of the system especially when using longer range light curtains or grids

DIMENSIONS (mm)



Safety light curtains

Brackets

SLC-B4 / SLC-B6 - Swivel brackets

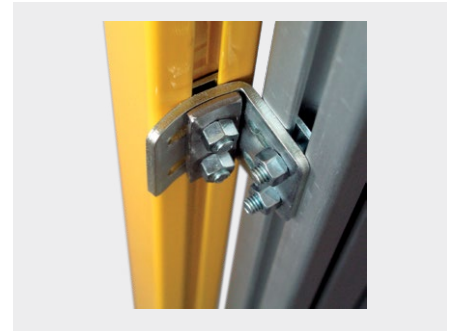
FEATURES

- The SLC-B4 / SLC-B6 swivel brackets allow the rotation of the light curtain around its longitudinal axis, as well as the adjustment of its vertical and horizontal position.
- The use of the SLC-B4 / SLC-B6 swivel brackets is recommended to align those light curtains which are employed in applications having a long range or using deflecting mirrors.

ORDERING INFORMATION

Description	Type	Part Number	Pkg
Set of 4 swivel brackets for SLCs with length \leq 1200 mm	SLC-B4	2447914-1	1
Set of 6 swivel brackets for SLC with length \geq 1200 mm	SLC-B6	2447914-2	1

* One set must be ordered for each pair of light curtain (emitter + receiver)



SLC-B4-180 - 180° swivel brackets

FEATURES

- The SLC-B4-180 swivel brackets allow the 180° rotation of the light curtain around its longitudinal axis, as well as the adjustment of its vertical and horizontal position.
- The use of the SLC-B4-180 swivel brackets is recommended to align those light curtains which are employed in applications having a long range or using deflecting mirrors.

ORDERING INFORMATION

Description	Type	Part Number	Pkg
Set of 4 180° swivel brackets for SLC	SLC-B4-180	2447914-3	1

* One set must be ordered for each pair of light curtain (emitter + receiver)



SLC-BFLAT4 - Flat brackets

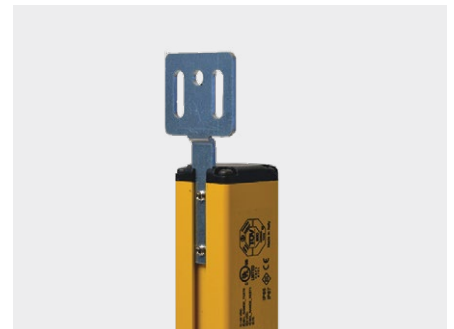
FEATURES

- The SLC-BFLAT4 brackets, with a thickness of only 4 mm, allow proper fastening of SLC light curtains.

ORDERING INFORMATION

Description	Type	Part Number	Pkg
Set of 4 flat brackets for SLC	SLC-BFLAT4	2447914-7	1

* One set must be ordered for each pair of light curtain (emitter + receiver)



SLC-BF - Fast coupling brackets

FEATURES

- The SLC-BF 4 brackets, with a thickness of only 4 mm, allow proper fastening of SLC light curtains.

ORDERING INFORMATION

Description	Type	Part Number	Pkg
Set of 2 fast-coupling brackets	SLC-BF2	2447914-4	1
Set of 4 fast-coupling brackets	SLC-BFAST4	2447914-5	1

* One set must be ordered for each pair of light curtain (emitter + receiver)



Safety light curtains

Other accessories

SLC-LASER - Laser alignment device

FEATURES

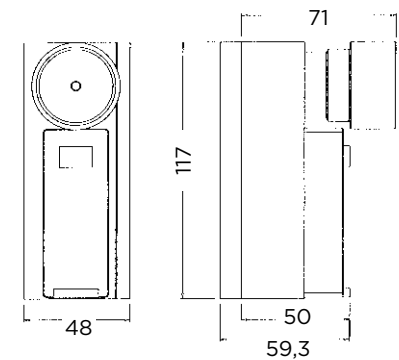
- SLC-LASER laser alignment device allows a fast and reliable optical alignment of safety light curtains; also compatible with the use of the SLC-MB floor mounting columns
- SLC-LASER devices emit a laser beam with visible red light with useful range up to 100 m
- The use is recommended for aligning light curtains that operate over long distances or multiple sides with the use of deflecting mirrors
- Light source: laser diode - wavelength 650 nm
- Class light source II - EN 60825-1
- Range (m): 100
- Beam divergence (mrd) < 0.5
- Max. power (mW): 1
- Power supply (VDC): 3 (2 AAA batteries)
- Fastening quick fastening to the light curtains
- Dimensions h x w x d (mm): 117 x 48 x 80

ORDERING INFORMATION

Description	Type	Part Number	Pkg
Laser alignment device	SLC-LASER	2447921-1	1



DIMENSIONS (mm)



SLC-VD4 / SLC-VD8 / SAV 12 - Vibration dampers

FEATURES

- The SLC-VD vibration dampers have been designed to significantly reduce mechanical damage to the light curtains installed in those applications with a high level of vibrations.
- The unprotected light curtains might feel the vibrations produced by e.g. presses, weaving machines, etc.

ORDERING INFORMATION

Description	For light curtains with protected height (mm) / beams	Type	Part Number	Pkg
Set of 4 vibration dampers	160	SLC-VD4	2447922-1	1
Set of 8 vibration dampers	310 to 1050	SLC-VD8	2447922-2	1
Set of 12 vibration dampers	1210 to 1810/2, 3, 4	SLC-VD12	2447922-3	1

* One set must be ordered for each pair of light curtain (emitter + receiver)



Safety light curtains

Other accessories

SLCPS-F/SLC-PS - Protective screens

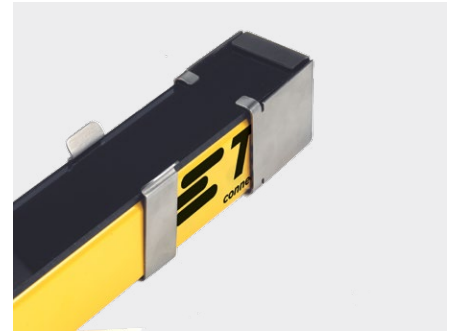
FEATURES

- SLC-PS is a polycarbonate protective screen that helps ensure the light curtain's front screen from damages due to welding sparks or due to the presence of acids in the workspace.
- Protective screens can be quickly replaced thanks to the fast and easy stainless steel clamping system.

ORDERING INFORMATION

Light curtain length (mm)	Description	Type	Part Number	Pkg
150	4 protective screen (2 as spare parts)	SLC-PS-015	2447920-2	1
300		SLC-PS-030	2447920-3	1
450		SLC-PS-045	2447920-4	1
600		SLC-PS-060	2447920-5	1
750		SLC-PS-075	2447920-6	1
900		SLC-PS-090	2447920-7	1
1050		SLC-PS-105	2447920-8	1
1200		SLC-PS-120	2447920-9	1
1350		SLC-PS-135	1-2447920-0	1
1500		SLC-PS-150	1-2447920-1	1
1650		SLC-PS-165	1-2447920-2	1
1800		SLC-PS-180	1-2447920-3	1
2 beams		SLC-PS-2B	1-2447920-4	1
3 beams		SLC-PS-3B	1-2447920-5	1
4 beams		SLC-PS-4B	1-2447920-6	1
	1 set of stainless steel clamps for one safety light curtain (emitter and receiver)	SLC-PS-F	2447920-1	1

*For each pairs of safety light curtain (emitter and receiver) it is necessary to order both codes.



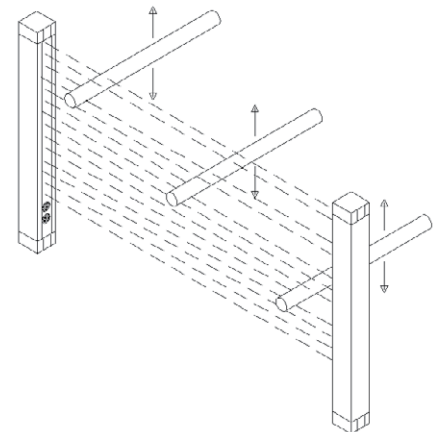
SLC-TR - Test rods

FEATURES

- The test rod is an opaque cylinder used after the installation of a safety light curtain to verify that no beams are bypassed due to the presence of reflecting surfaces.
- The test is carried out by slowly moving the test rod (\varnothing = resolution) in the centre and then along each side of the protected area. During this procedure the green led on the receiver must always remain in the off state.

ORDERING INFORMATION

Diameter	Type	Part Number	Pkg
Ø 14 mm	SLC-TR 14	2447919-1	1
Ø 20 mm	SLC-TR 20	2447919-2	1
Ø 30 mm	SLC-TR 30	2447919-3	1
Ø 40 mm	SLC-TR 40	2447919-4	1
Ø 50 mm	SLC-TR 50	2447919-5	1



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Safety Light Curtains Catalog 10/23

Catalog

TE Connectivity

3, rue Jean Perrin
69687 Chassieu cedex
France

Tel: +33 481923100



Safety Products Light Curtains & Safety Relays

November 2023

EVERY CONNECTION COUNTS



Agenda

INTRODUCTION

- Basics on safety

PROJECT SCOPE

SAFETY LIGHT CURTAINS

- Concept & features
- Product scope
- Accessories

SAFETY INTERFACES

- Concept & features
- Product scope

MARKETING COLLATERALS

CONCLUSION



BASICS ON SAFETY

EVERY CONNECTION COUNTS



WHAT IS SAFETY?

Machinery Safety

Machinery safety is the basis for secure cooperation between human and machine. The use of secure automation helps **protect staff** from the **hazards** that emanate **from plant and machinery**, enables smooth operation and helps increase production quality.

Machinery safety refers to the practices, measures, and standards put in place to help ensure the well-being of individuals interacting with machines.



WHAT IS SAFETY?

Safety

Active protective measures are usually implemented by **selecting** and **combining** in an appropriate way hardware components (such as sensors, switches, logic units, relays etc.) to build up a **Safety Related Control System**

A **control system** that executes an **active protective measure** is said to carry out a **safety function** and the control system itself is called **Safety Related Control System**.



Safety function	Example of application
Safety –related stop function initiated by a safeguard	Stop a motor in response to tripping of a protective device
Manual reset function	Intended action to re-establishes the safeguard after its actuation. Acknowledgement that risk is no more present
Start/restart function	Start of a dangerous movement can take place only when an hazardous situation no more exists
Muting function	Automatic temporary suspension of a safety function
Hold-to-run function	Hazardous machine movements can be controlled from a position within the hazard zone, e.g., inching mode during setup
Prevention of unexpected start-up	Keeping a machine in a stopped condition while persons are present in danger zones
Operating mode selection	Activation of safety functions by an operating mode selector switch
Safe motion, safe position	Overspeed, overtravel control

WHAT IS SAFETY?

Main standards Europe

Fundamental product European directives :

2006/42/EC: “Machine Directive” → for machine manufacturers

2014/30/EU: “Electromagnetic Compatibility Directive” → applies to electrical & electronic devices

2014/35/EU: “Low Voltage Directive” → Applies to electrical equipmentl from 50 V to 1500 V

Umbrella machinery safety standards

ISO 13849 “Safety of machinery”

IEC 61508 “Functional safety of electrical / electronic / programmable electronic safety related systems” which impacts safety of machinery especially through

IEC 62061 “Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems”

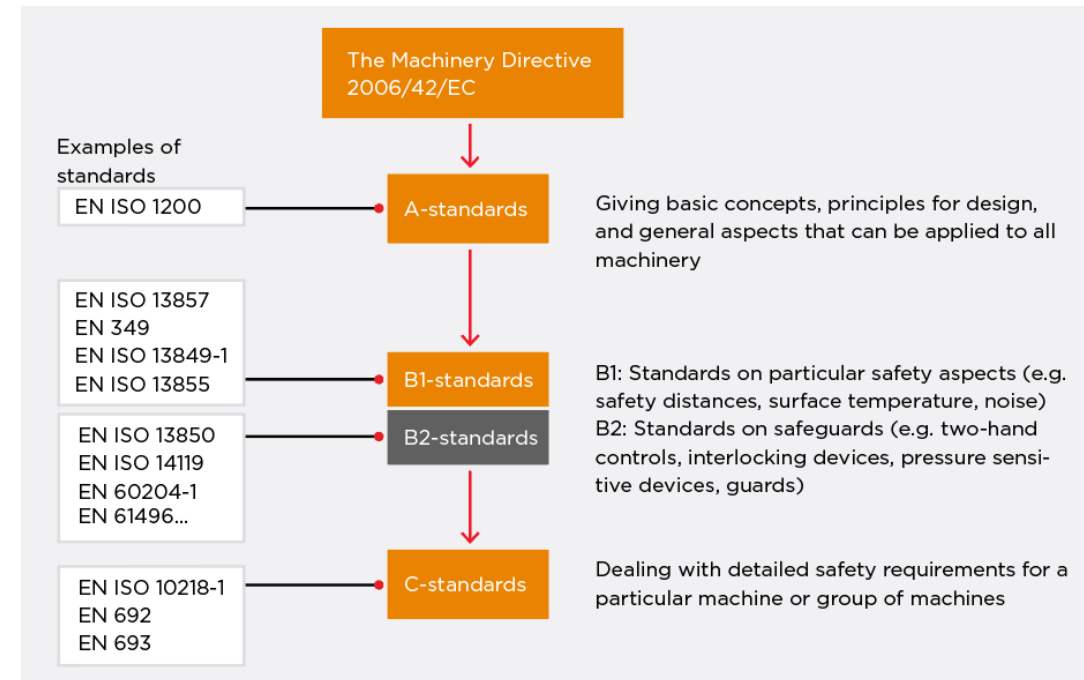
IEC61496 “Safety of machinery – Electro-sensitive protective equipment

Main standards North America

Health & Safety is governed by OSHA (Occupational Health and Safety Administration)

ANSI (American National Standard Institute) **issue standards** on the safety of machine tools and construction

Underwriters Laboratories Inc (UL) or CSA are the bodies that **issue certifications** for safety equipment



A type C Standard takes priority over type A and B Standards

WHAT IS SAFETY?

Safety levels

SAFETY LEVEL

TYPE 4

SIL 3 - SILCL 3 | PL e - Cat. 4

TYPE 2

SIL 1 - SILCL 1 | PL c - Cat. 2

SIL (Safety Integrity Level) as per EN 62061

Can only be used for electrical, electronic or programmable safety solutions.

PL (Performance Level) as per EN ISO 13849-1

is a technology-neutral concept that can be used for electrical, mechanical, pneumatic and hydraulic safety solutions.

Category : refers to the machine itself and achievable PL.

Goes from category B (basic) to category 4 (highest).

Ex: Category 4 allow to reach PL e (highest protection against higher risk)

Type : refers to the specific design of protection equipment like a safety light curtain or relay.

Type 4 device would be most likely to be used in a category 4 application, and a Type 2 light curtain could probably only be used for a category 2 application

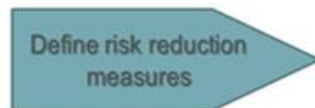
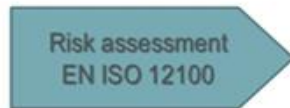
SIL is particularly **well-suited to large, complex facilities or factories** with multiple machines, while **PL** is **suitable for individual machines**.

WHAT IS SAFETY?

RISK EVALUATION : **PLr** (**P**rotection **L**evel **r**equired)

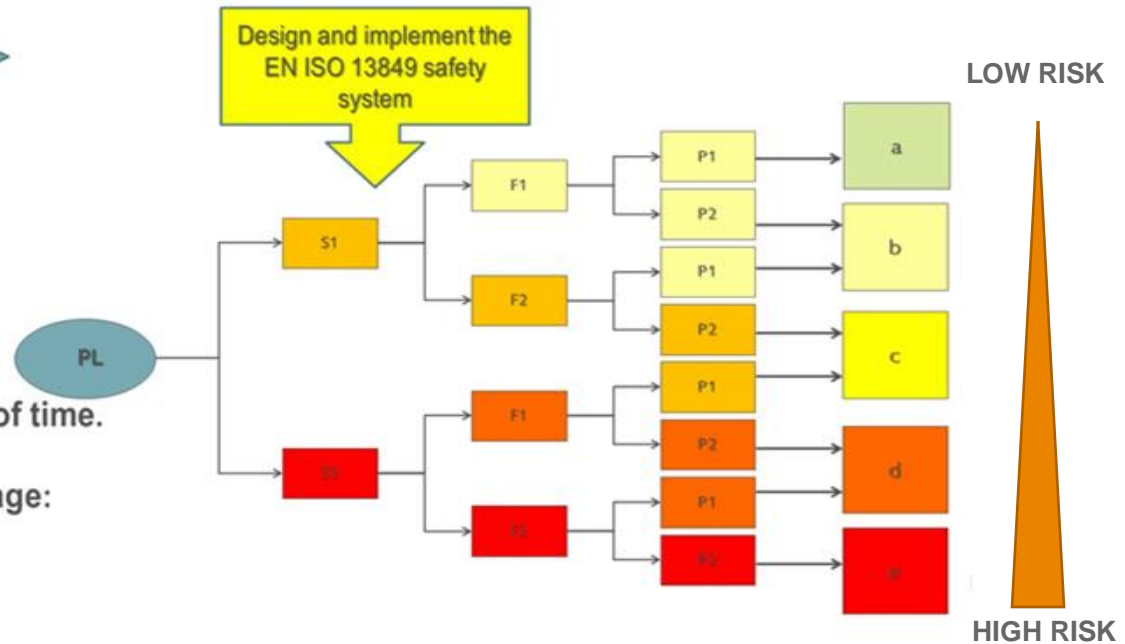
Machinery Directive - Overview of the steps to achieve the level of safety required by each application

▼ Objective: risk reduction by applying defined control measures



How to determine the required performance level – PLr:

- S = severity of the damage:
 - S1= light damage– reversible;
 - S2= serious damage– irreversible.
- F = frequency and/or danger exposition:
 - F1= rare and/or for a limited time;
 - F2= frequent/continuous and/or for an extended period of time.
- P = possibility of avoiding the danger or limiting the damage:
 - P1= possible within certain conditions;
 - P2= hardly possible.



PLr(e) provides the greatest contribution to risk reduction

PROJECT SCOPE

EVERY CONNECTION COUNTS



Product portfolio

SAFETY LIGHT CURTAINS

SLC4 Range



SAFETY LEVEL

TYPE 4
SIL 3 - SILCL 3 | PL e - Cat. 4

SLC2 Range



SAFETY LEVEL

TYPE 2
SIL 1 - SILCL 1 | PL c - Cat. 2

SAFETY INTERFACES

SRS - SRK RANGE



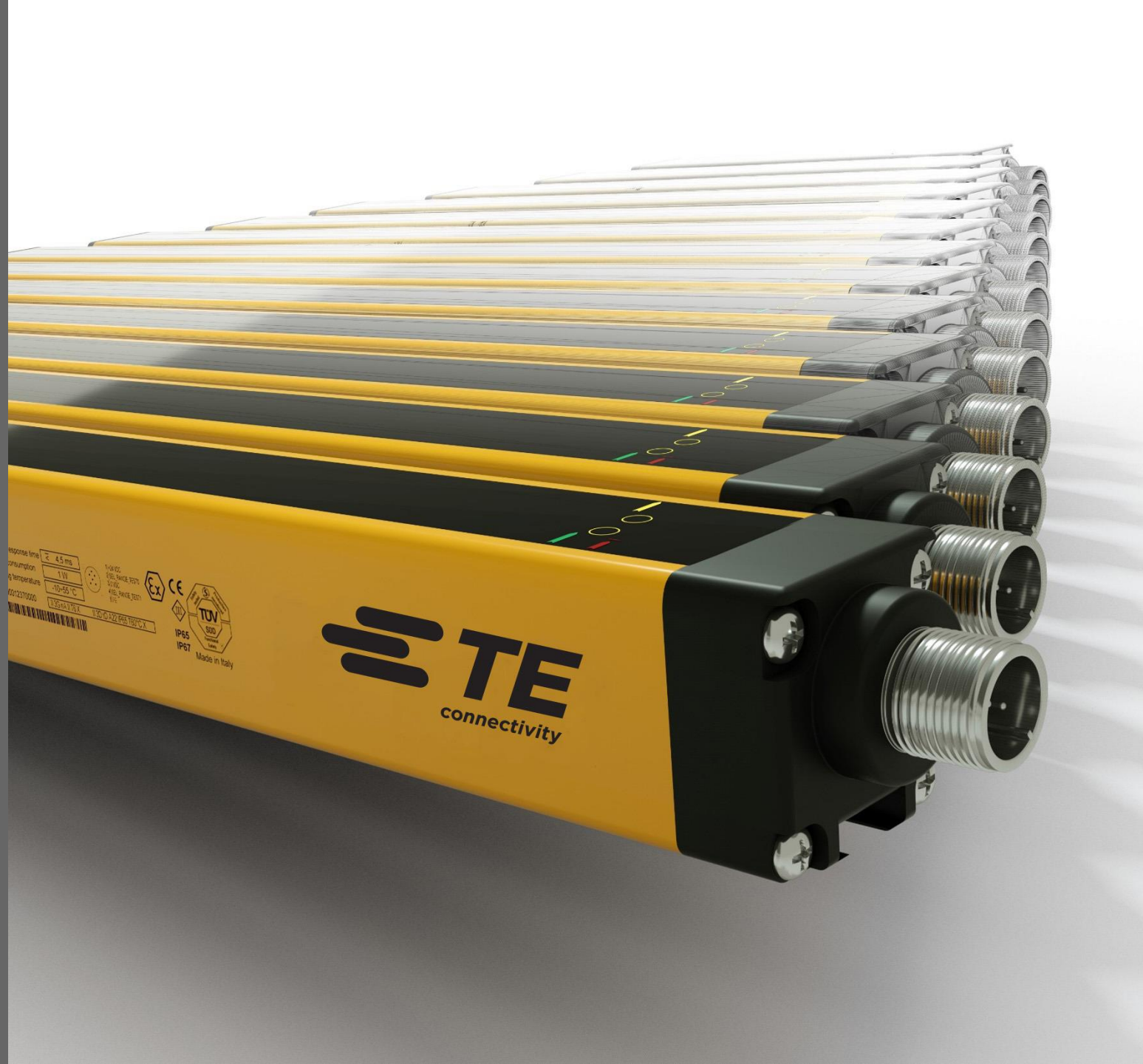
SINGLE & MULTI-FUNCTION SAFETY RELAYS

Type 4 SIL 3 - SILCL 3 | PL e - Cat. 4
OR
Type 2 SIL 1 - SILCL 1 | PL c - Cat. 2

SAFETY LIGHT CURTAINS

SLC Range

EVERY CONNECTION COUNTS



response time ≤ 4.5 ms
consumption 1 W
operating temperature -10 to $+55$ °C
KSI2310000
TE Connectivity
IP65
IP67
Made in Italy

TE
connectivity

Safety Light Curtain : Principle of operation

The SLC uses a combination of an **emitter** and a **receiver**. Multiple **parallel beams** are emitted with various **resolutions** (distance between beams).

If no object or people are blocking the beam between the emitter and receiver, the machine is in a secure state and is allowed to operate.

On the other hand, **if any or all** of the light beams are **blocked by a human finger, hand or body**, the machine determines the situation to be hazardous and **turns off** the output of the receiver to stop the machine.

SLC's are considered as **sensors**



Emitter Receiver



Safety Light Curtain : Advantages

- Effective protection in **the event of fatigue or distraction** of the operator.
- Increase in the productive capacity of the machine as the SLC **does not require** the manual handling of physical guards or waiting for them to open.
- **Faster** machine loading/unloading operations.
- **Reduced times** of approach to the working areas.
- **Virtually elimination risk of tampering** since any irregular intervention on the light curtain stops the machine.
- **Simple and quick installation**, with greater flexibility of adjustment on the machine, even in the case of subsequent repositioning.
- Possibility **to build up large sized protections**, either **linear** or **along a perimeter**, on several sides, at **greatly reduced costs**.
- **Facilitated and fast maintenance** of the machine, as there is **no need to remove physical guards**, such as grids, gates, etc.
- **Improved appearance** and **ergonomic** effectiveness of the machine.



Safety Light Curtain : Main Characteristics

SAFETY LEVEL

SAFETY LEVEL

TYPE 4

SIL 3 - SILCL 3
PL e - Cat. 4

SAFETY LEVEL

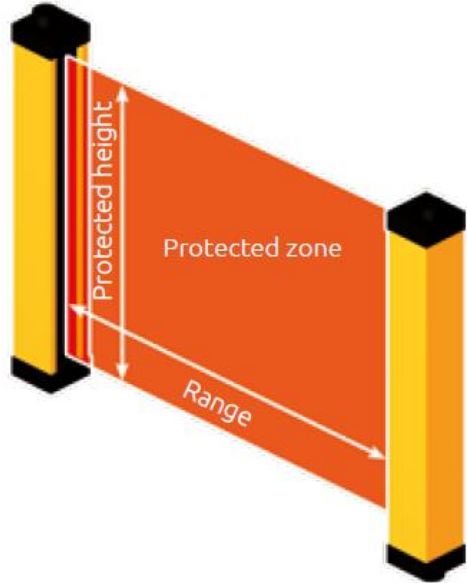
TYPE 2

SIL 1 - SILCL 1
PL c - Cat. 2

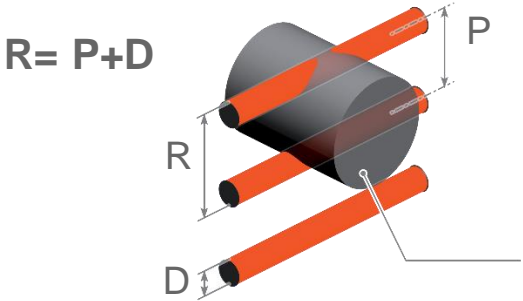
RESOLUTION

FINGER resolution 14 mm	HAND resolution 20 mm-30 mm-40 mm
BODY resolution 50 mm-90 mm	ACCESS CONTROL 2-3-4 beams

PROTECTED HEIGHT RANGE PROTECTED ZONE



RESPONSE TIME



SLC4 Type 4 Safety Light Curtain

Main features

SLC4



4 types of detection    

6 resolutions :

- 14 mm for finger detection
- 20 mm, 30 mm, 40 mm for hand detection
- 50 mm, 90 mm for detection of the body in a dangerous area

Access control : 2-3-4 beams for body detection

Protected height range 160 mm to 2250 mm

Maximum range:

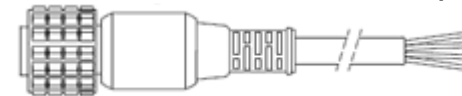
- Selectable 3 m to 6 m for 14 mm resolution models (finger)
- Selectable 4 m to 12 m for other models (hand & body)
- Selectable 10 m to 20 m for L versions

Integrated manual or automatic Start/Restart

Feedback input for external relay monitoring

M12 5/8 poles connectors

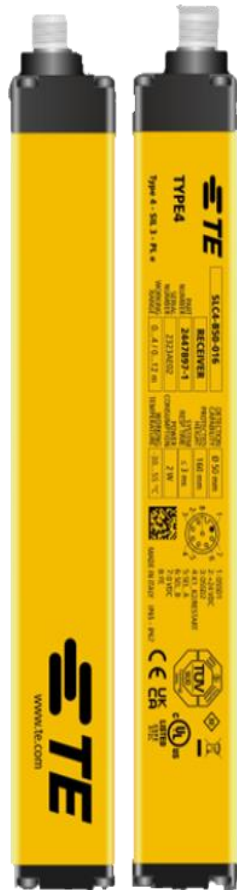
Use of unshielded cables up to 100m



SLC4 Type 4 Safety Light Curtain

Models with automatic restart, integrated functions and longer range

SLC4



SLC4...

Manual/Automatic Start/Restart

Feedback input - EDM

Connectors: M12/5 (Emitter), M12/8 (Receiver)

Max range: 6 m (14 mm), 12 m (20 mm, 30 mm, 40 mm, 50 mm, 90 mm and 2-3-4 beams)

SLC4...L

Manual/Automatic Start/Restart

Feedback input - EDM

Connectors: M12/5 (Emitter), M12/8 (Receiver)

Max range: 20 m for 20 mm, 30 mm, 40 mm, 50 mm, 90 mm and 2-3-4 beams

SAFETY LEVEL

TYPE 4

SIL 3 - SILCL 3
PL e - Cat. 4

Type 4	IEC 61496-1-2
Category 4	ISO/EN 13849-1
PL e	ISO/EN 13849-1
SIL 3	IEC 61508
SIL CL 3	EN 62061



SLC2 Type 2 Safety Light Curtain

Manual/Automatic Start/Restart



SLC2...

3 types of detection



4 Resolutions

- 30 mm - 40 mm for hand detection
- 50 mm - 90 mm for detection of the body in a dangerous area

Access control : 2-3-4 beams for body detection

Protected height range 160 mm to 2250 mm

Max range 12 m (20 mm, 30 mm, 40 mm, 50 mm, 90 mm and 2-3-4 beams)

Integrated manual or automatic Start/Restart

Feedback input for external relay monitoring

M12 5/8 poles connectors

Use of unshielded cables up to 100 m

SAFETY LEVEL

TYPE 2

SIL 1 - SILCL 1
PL c - Cat. 2

- Type 2 IEC 61496-1:2004
IEC 61496-2:2006
- Category 2 ISO/EN 13849-1:2008
- PL c ISO/EN 13849-1:2008
- SIL 1 IEC 61508-1:1998
IEC 61508-2:2000
- SIL CL 1 EN 62061:2005



One simple product range to cover wide range of today's industrial applications

Reliable and compact

High ingress protection ratings

IP67 and IP65 supports protection against dirt, dust, sand, water, projections and other liquids with IP67 and IP65 ratings. High resistance to infiltration by dust and liquids in a highly compact light curtain

Compact size

SLC is one of the smallest light curtains in the market (with integrated safety functions) With a minimal cross section: 28 mm x 30 mm

Robustness

Thanks to powder-coated aluminum casing, SLC range can obtain high level of reliability. Also, highly reliable in cold storage facilities with -30° C to +55° C operating temperature

Safe and Smart

Virtually no blind area

Thanks to the position of the 1st beam on the connector side, this helps protected area to extend until the light curtain end and maintain the resolution

Fast, simple installation

Plug and play thanks to the M12 connectors and the use of unshielded cables. Virtually no programming necessary Easy to install and replace

User-friendly diagnostics via

LEDs Status indicating display that including alignment aids are helping the user to diagnose the status

High level of productivity and safety

High Safety grades

Type 2 and Type 4 SLC light curtains approved in accordance with;

- EN IEC 61496-1/-2
- ANSI / UL 1998

Finger, hand and body protection

From safety light barriers supporting body protection to the light safety light curtain for higher finger and hand protection, the product series SLC4 and SLC4 cover a large portfolio

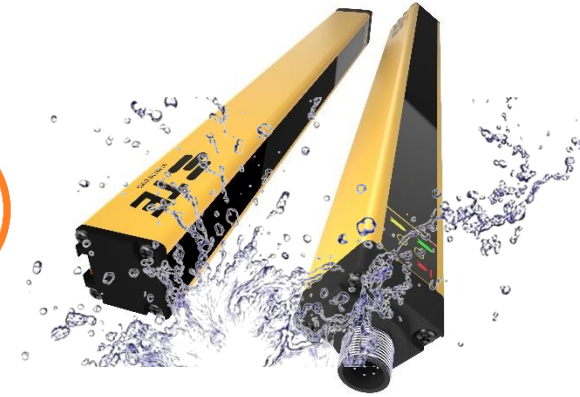
A range updated to your needs

Integrated safety functions, including self-monitoring of static outputs, control of external contactors (EDM) and selectable automatic/manual restart, supports increased productivity due to reduced downtimes

Reliable and compact

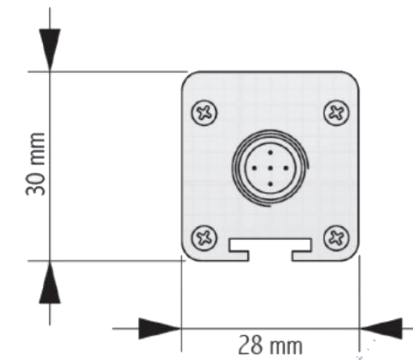
High ingress protection ratings IP67 and IP65

- Helps protect against dirt, dust, sand, water, projections and other liquids
- Resistance to infiltration by dust and liquids in a highly compact light curtain



Compact size

SLC is one of the smallest light curtains in the market (with integrated safety functions) With a minimal cross section: 28 mm x 30 mm



Robustness

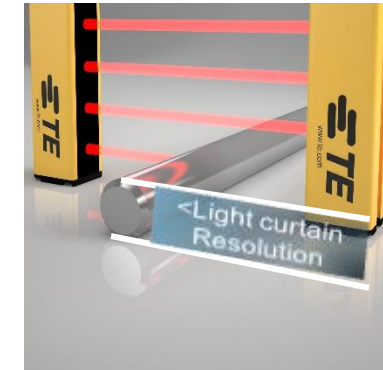
Thanks to powder-coated aluminum casing SLC range can obtain high level of mechanical reliability. Also, highly reliable in cold storage facilities with -30° C to +55° C operating temperature



Safe and Smart

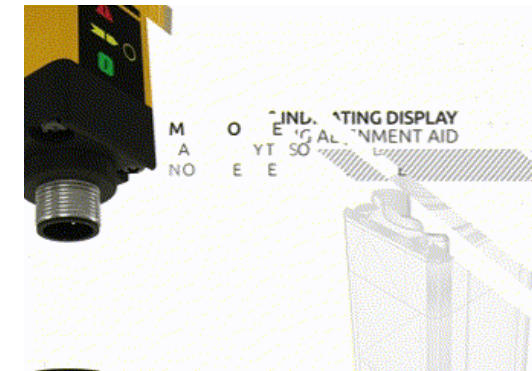
Virtually no blind area

Thanks to the position of the 1st beam on the connector side, this helps protected area to extend until the light curtain end and maintain the resolution.



Fast, simple installation

Plug and play, easy to install & replace thanks to the M12 connectors
Unshielded cables.

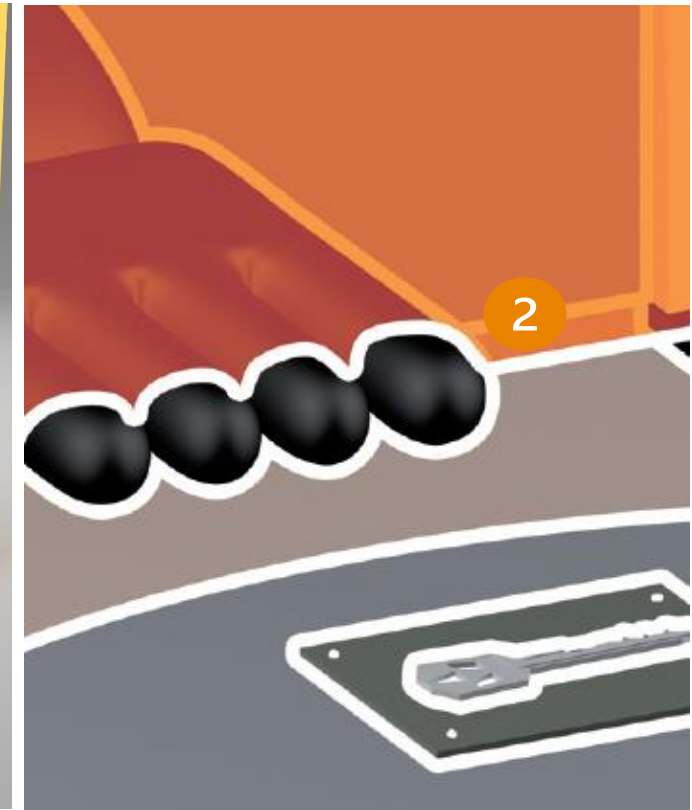
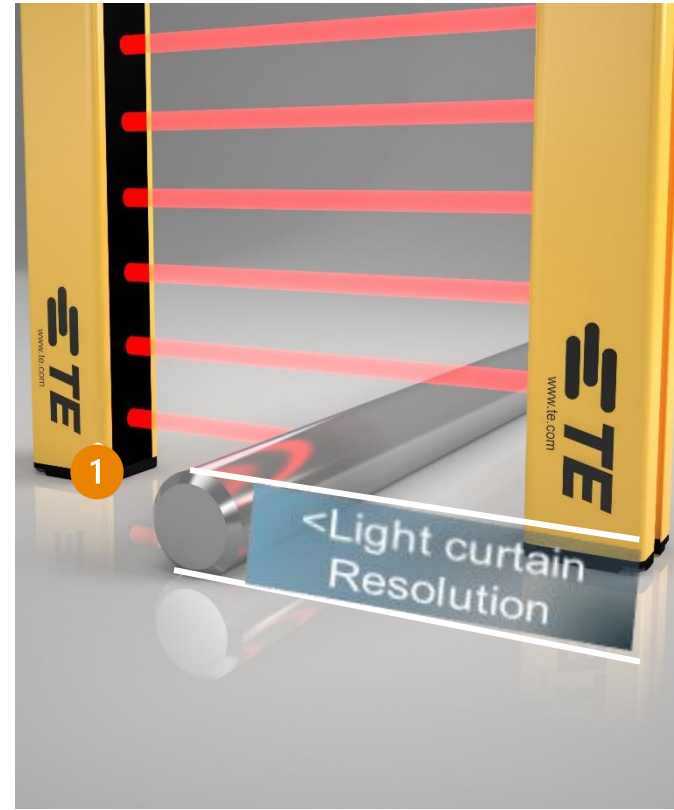
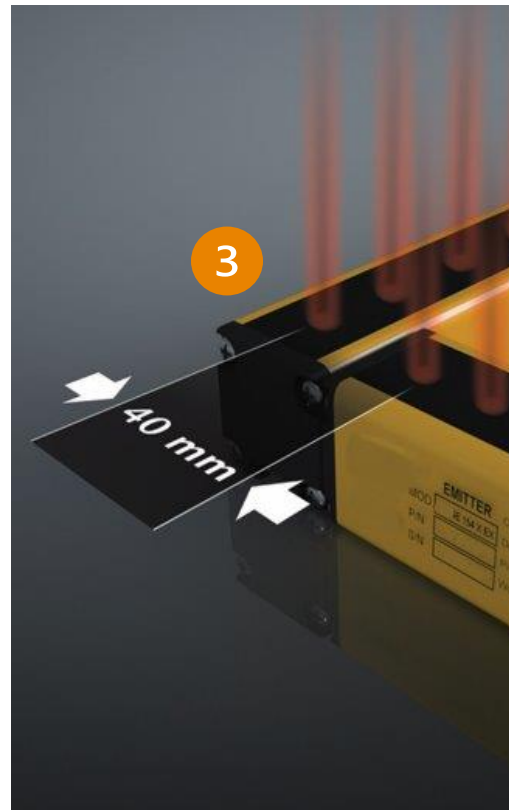
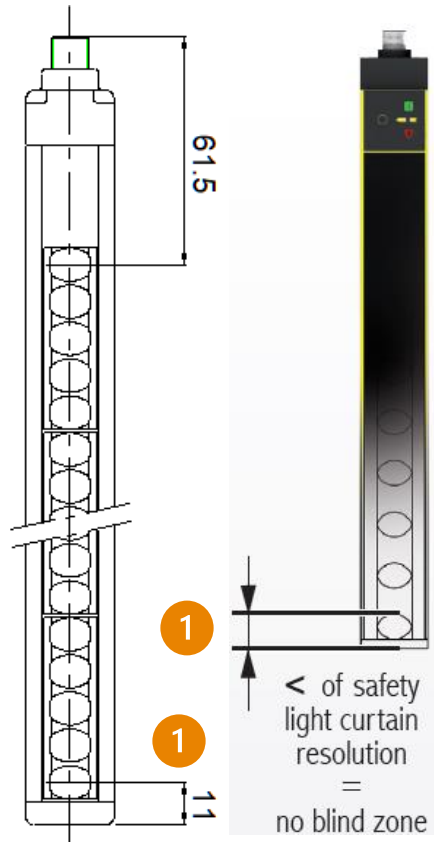


User-friendly diagnostics via LEDs

Status indicating display that including alignment aids are helping the user to diagnose the status

Safe and Smart : Virtually no blind area on one side

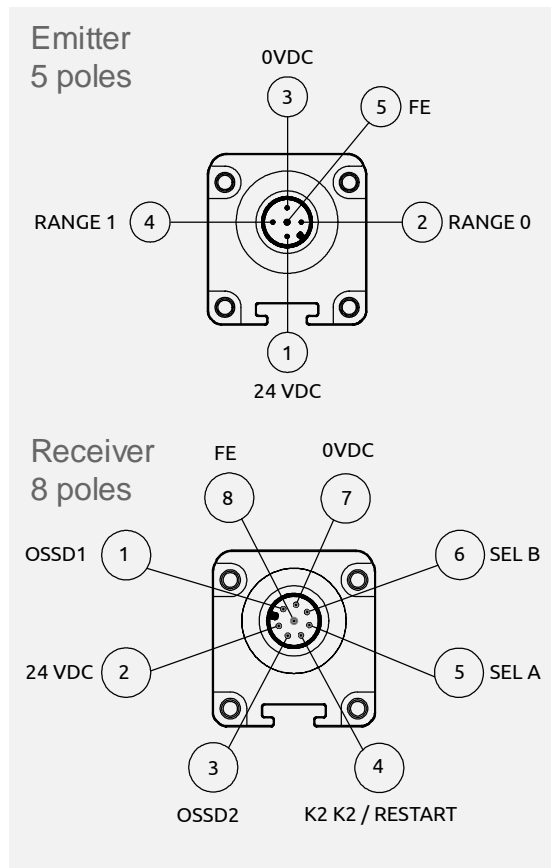
- 1 Thanks to the position of the 1st beam, The protected area extends until the light curtain end maintaining the finest resolution up to (14 mm)
- 2 Fingers and hands are always detected and protected on the entire height
- 3 2 L-mounted light curtains maintain 40 mm resolution (hand detection) in corner (models with resolution 30 mm and 40 mm)



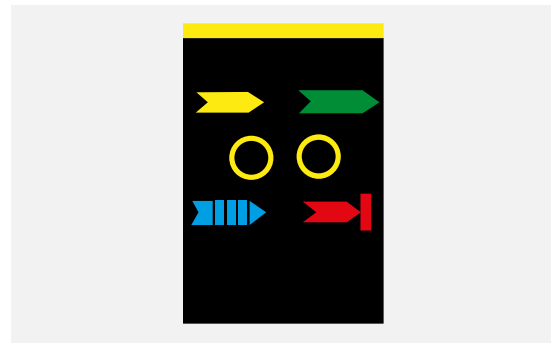
User interface

Pin-out and display information

Pin-out (X/XH models)

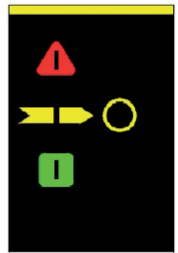


Display information



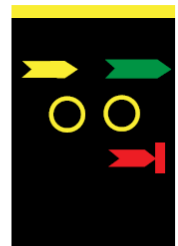
Emitter - All models

Three colour LED	Meaning
	System power-on - Initial TEST
	System power-on - HIGH working range selected
	FAIL condition - The type of fault is identified by the number of flashes - See technical manual
	TEST condition
	Normal operating condition



Receiver - All models except SLC4 14 mm and L (range 20 m) versions

1 - Yellow LED	2 - Two colour LED	Meaning
		System power-on - Initial TEST
		BREAK condition
		CLEAR condition - SLC4 (with integrated control functions) only
		BREAK_K condition - SLC4 (with integrated control functions) only
		GUARD condition
		FAIL condition - The type of fault is identified by the number of flashes - See technical manual



On the receivers of 14 mm resolution and H models a blue LED indicates a weak signal intensity.

During alignment operations, checking the blue LED status can be helpful. During standard operation it must remain off.

SAFETY RELAYS

SRS-SRK Range

EVERY CONNECTION COUNTS



Safety Relays

...for barriers with automatic start/restart (SLC series)

SRS safety relays

The Safety Relays are a dedicated interface between safety light curtains, equipped with self-controlled safety static outputs, and control circuits of the machine or plant



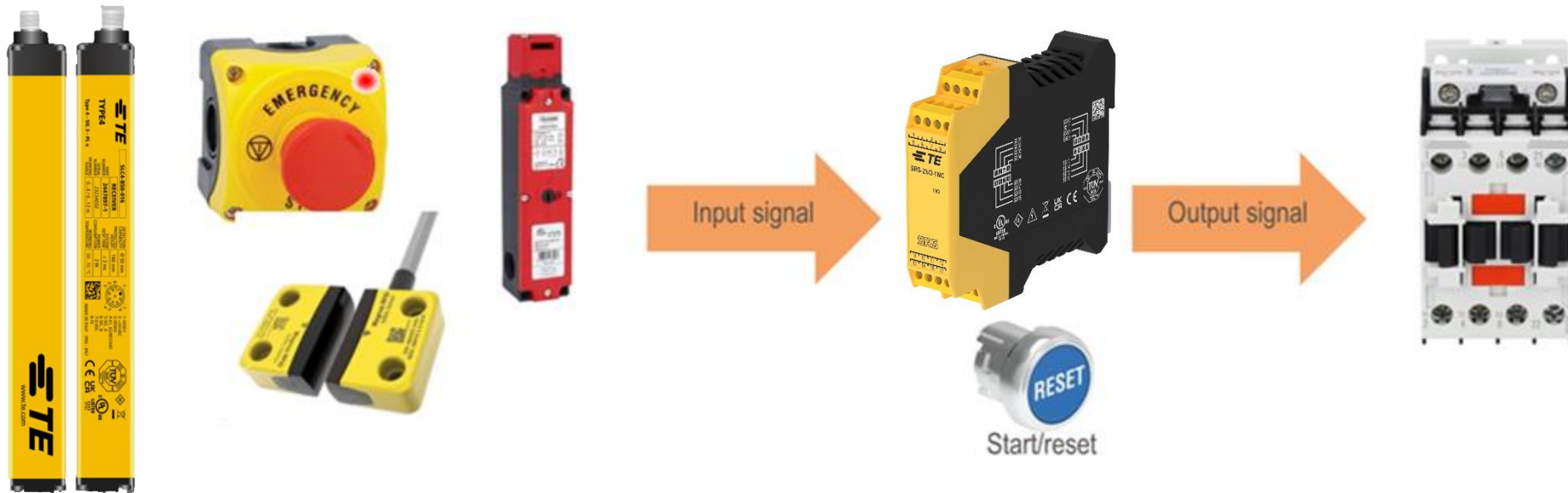
- SRS-2NO-1NC → Safety interface for devices with integrated feedback input for EDM (with auxiliary contact). 2 NO + 1 NC. Screw Terminal Blocks
- SRS-2NO → Safety interface for devices with integrated feedback input for EDM. 2 NO. Screw Terminal Blocks

- SRS4-2NO → Safety interface for OSSD output devices. 2 NO. Screw Terminal Blocks
- SRS4M-2NO → Safety interface with integrated Muting functions for OSSD output devices. 2 NO. Screw Terminal Blocks
- SRS MULTI → Multifunction Safety Relay, Screw Terminal Block

(Safety Light Curtains, Solid-State-Output Devices (i.e. RFID safety switches), Dual-Channel Emergency Stops, Two-Hand Controls and Safety, Photocells)

How is it functioning?

Safety relays are devices used to control the safety-related part of control systems in such a way that machine operation is only allowed when safety is confirmed. It supports safety by controlling signals coming from inputs, especially emergency stop switches and locking switches and controls the contactors and other devices connected to the outputs according to the results of this detection. In other words, the safety relay module and safety controller play a central role as the logic unit in the safety-related part of the control system.



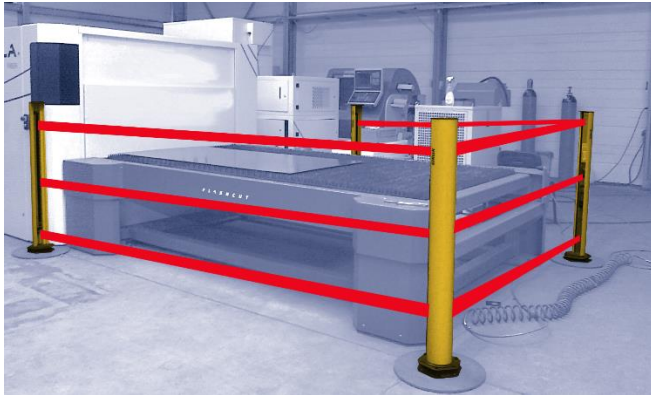
Typical applications

- Robotics
- Food & beverage
- Packaging
- Pharmaceuticals
- Paper
- Logistics
- Metalworking
- Woodworking
- Chemicals
- Injection moulding
- Printing



AFG- Robotics, Machinery, Control cabinet

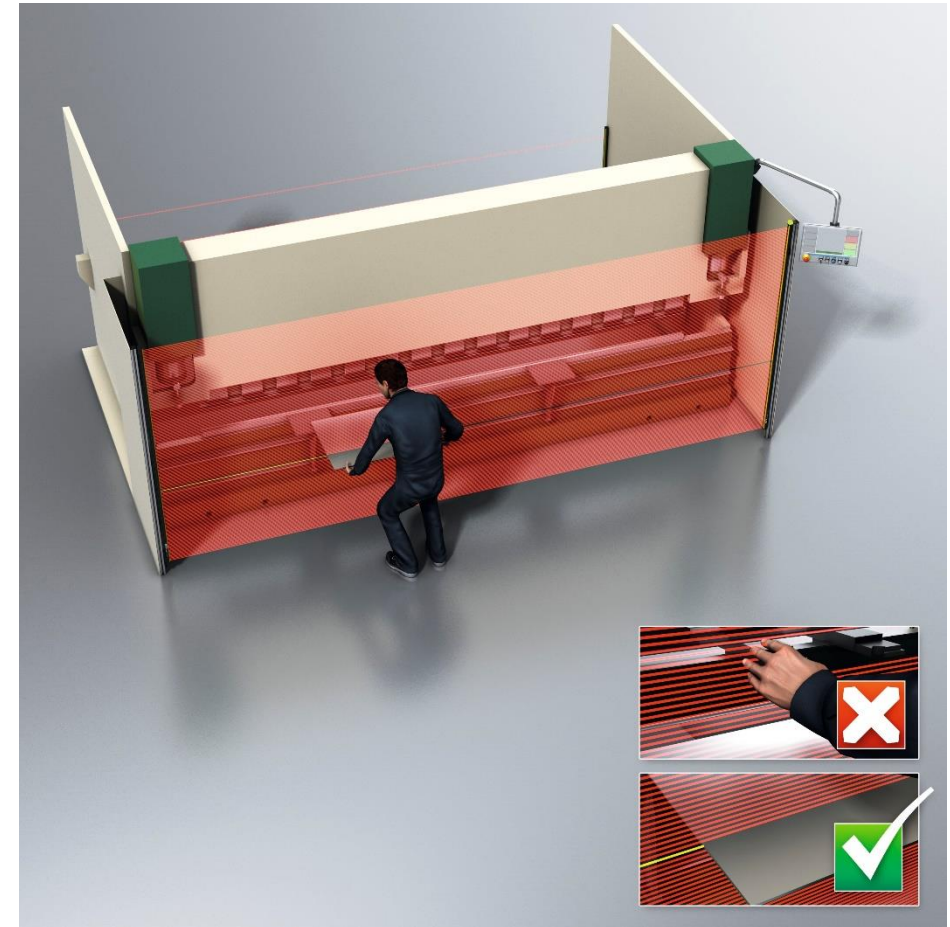
Safety area with light curtains and mirrors



Safety area with light curtains for machinery



Safety solution for OEM machine builders

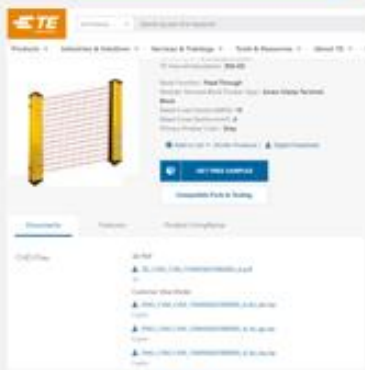


Safety systems for robots
Safe Robotics Area supports protection, safer access to cooperative robot applications for less downtime, enhanced work processes and higher productivity.

Marketing Materials

TE.COM

Product sheet

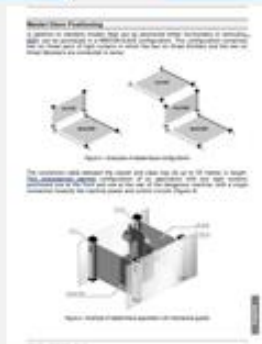


CVM Samples



Technical guides

Manuals and Quick guides



Media

Datasheets, Catalogue page



Demokit

Demo kits



Training Materials

1. Webinars
2. Training PPT
3. Customer PPT





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**CONNECT
LIKE THE WORLD
DEPENDS ON IT.
BECAUSE IT DOES.**

EVERY CONNECTION COUNTS

