



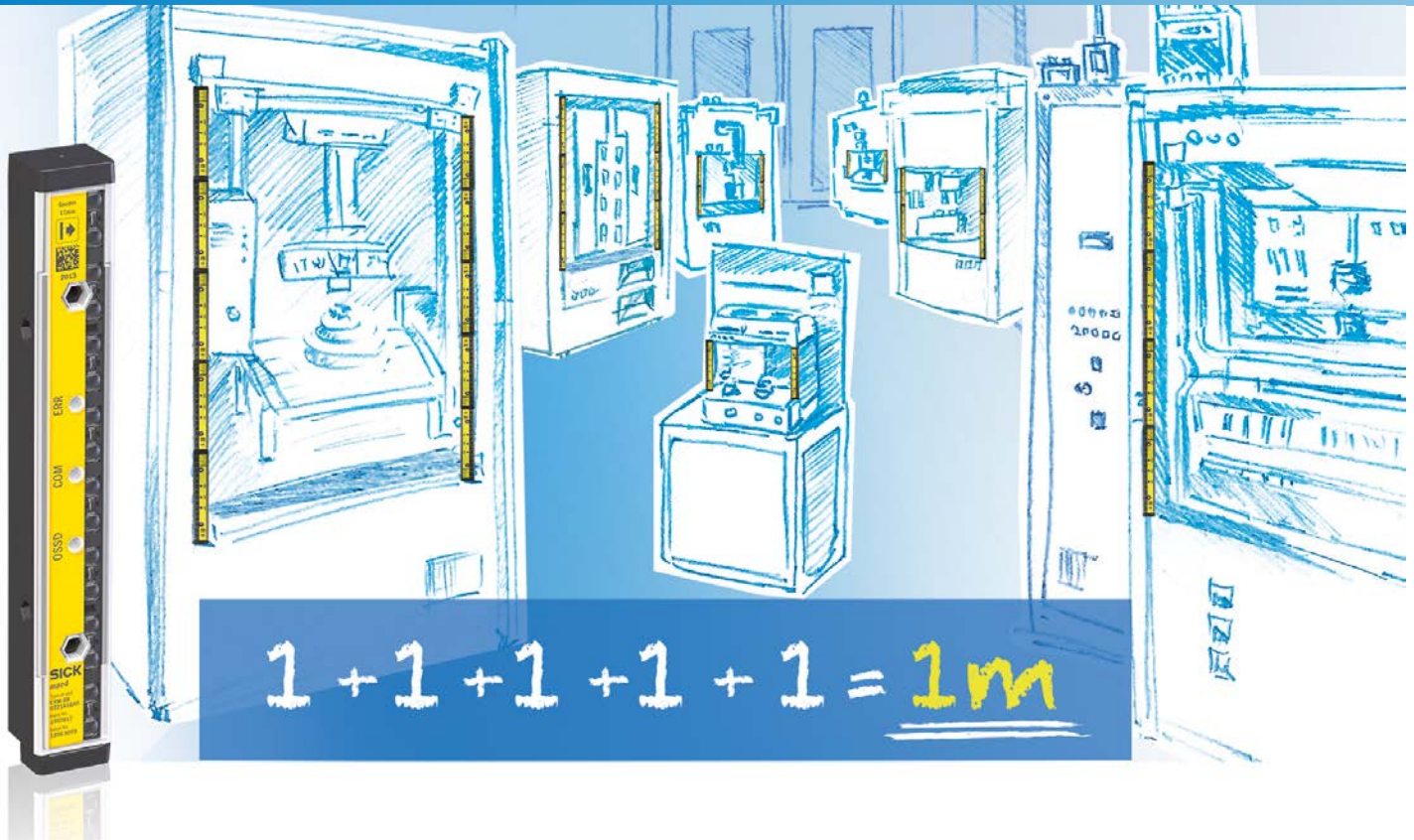
# mac4

THE TAILORED SAFETY SOLUTION

Safety light curtain

**SICK**  
Sensor Intelligence.

# THE TAILORED SAFETY SOLUTION: THE MODULAR mac4 SAFETY LIGHT CURTAIN



Never before has safety in the workplace been so innovative and customized. The mac4 safety light curtain has a modular design, making its use on different machines flexible and cost-effective.

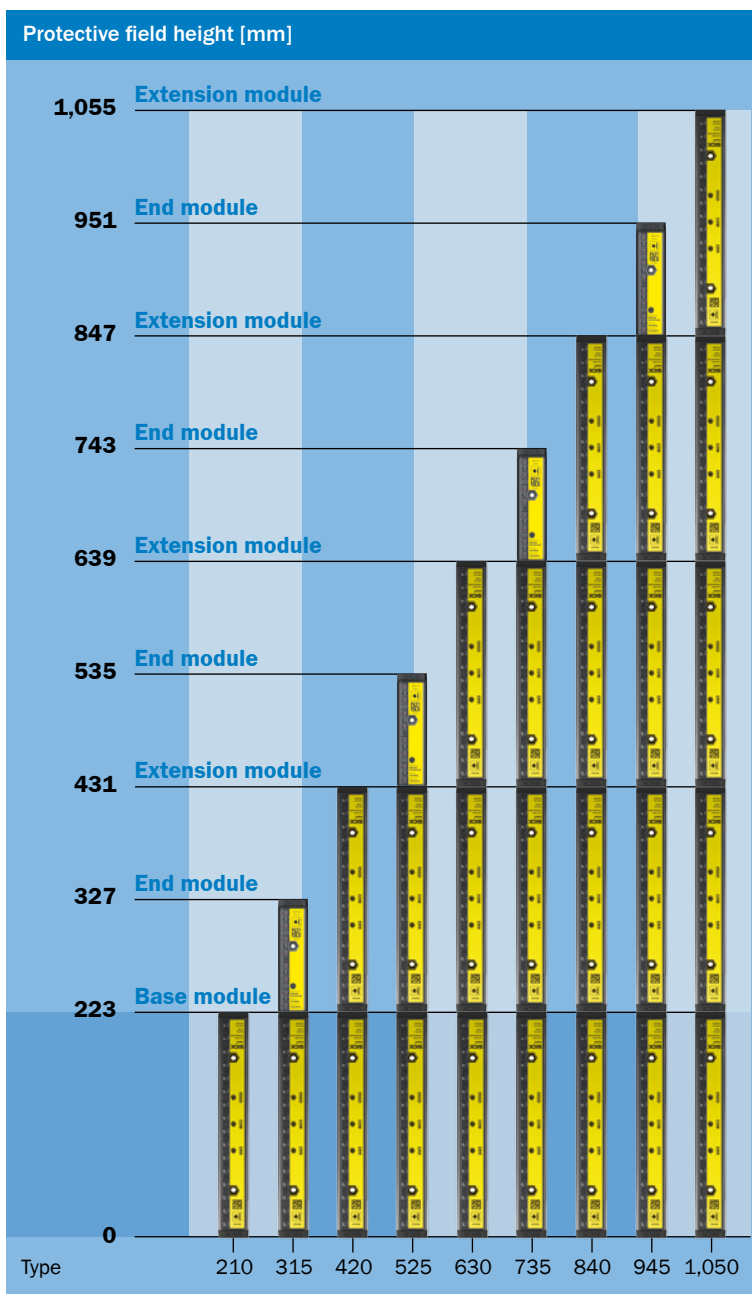
## Perfect economy

Even during planning, the mac4 safety light curtain was designed to ensure safety as cost-effectively as possible. Easy machine integration and fast commissioning also save time. The user benefits from optimized warehousing thanks to much smaller space requirements and high availability for various protective field heights.

## Pure simplicity

The simplicity and ease of handling of the mac4 are impressive. Thanks to the modular housing design, only a few components are required to combine different protective field heights. Innovative adjustable brackets for an efficient alignment for mounting situations without suitable machine frame. The electrical connection is reduced to a 4-pin connecting cable.

## ADD UP THE SAFETY YOU NEED: 1 + 1 + 1 + 1 + 1 = 1 m



The modular mac4 safety light curtain – tailored for your machine.

### Modular + compact = Simple

The new mac4 safety light curtain is based on a modular housing design and innovative combination of base and extension modules (sender and receiver).

### Highest level of protection = PL e

With simple functionality and the highest level of protection type 4, the mac4 safety light curtain is reduced to the essentials. Tailored safety for small machines.

### Result = Tailored safety

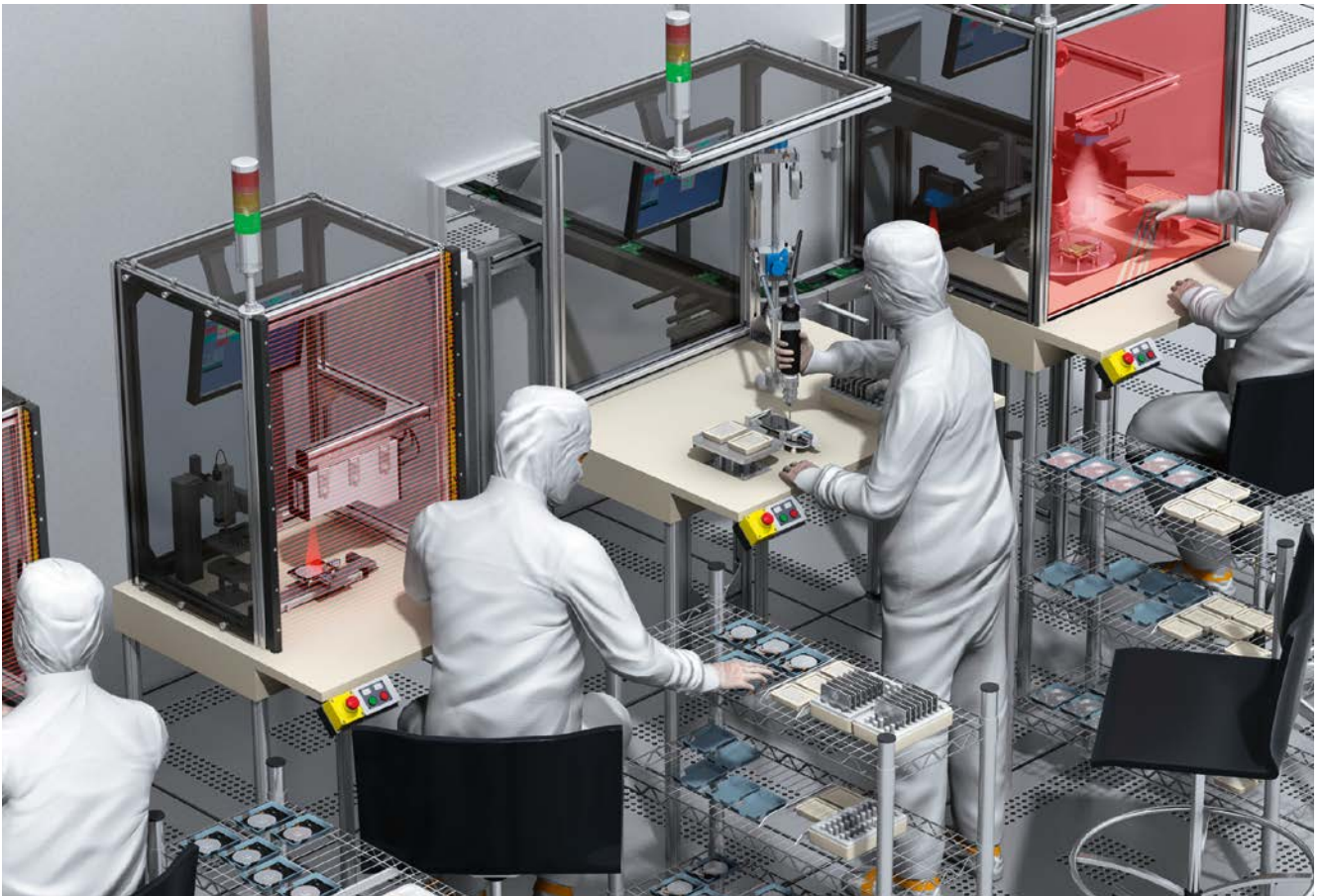
One base module and up to four extension modules are available for protective field heights of 210 to 1,050 mm. The two resolutions of 17 or 30 mm ensure reliable detection. And all that for protective field heights up to 1 m at a scanning range up to 3.20 m.

# PERFECT ECONOMY

Benefit from optimized warehousing thanks to much smaller space requirements and high availability for various protective field heights.

## Cost-effective in every respect

Due to its simple installation and fast commissioning, the mac4 safety light curtain saves time and money from the start. On top of that the compact modules can be stored individually, resulting in much lower storage costs.



# MODULAR SAFETY FOR ASSEMBLY STATIONS

The mac4 safety light curtain combines the highest level of protection with high cost-effectiveness. It allows customized protection of small assembly stations at minimal effort.

## Typical applications

The mac4 safety light curtain is well-suited for small mounting and handling stations for subassemblies and devices. Semi-automatic assembly stations equipped with rotary tables or small presses are an example. It also takes full advantage of its small space requirements on test and measurement equipment.



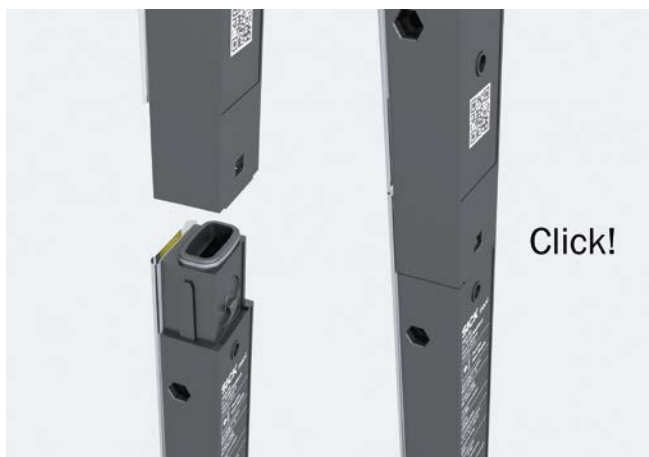
## Typical industries

The mac4 safety light curtain brings practical safety to a variety of industries. The spectrum ranges from the electronics and solar industries to the automotive supplier industry to machine builders, who manufacture automated assembly stations of all kinds.



# QUICK AND EASY MOUNTING WITHOUT BRACKETS

The mac4 safety light curtain impresses with sophisticated technology for installation.



The individual modules are easy to combine



Rear mounting on the machine frame directly



Side mounting on the machine frame directly



Adjustable brackets for an efficient alignment

# EASY TO INSTALL

The mac4 offers quick and easy handling with a 4-pin connecting cable and industry-standard M12 plugs.



Machine integration without blind zones



Selectable cable outlet direction



Cost-effective, standard 4-pin connecting cable with M12 plug



All connection cables with M12 plug

For more information, visit [www.sick.com/mac4](http://www.sick.com/mac4)

# PLUG & PLAY

The mac4 safety light curtain is ready to use within just a few seconds of switching it on. The integrated LEDs indicate all phases of power-up.



1. After power-up, the OSSD LED lights up red and the COM LED flashes white.



2. When the mounting surfaces are properly aligned, the white COM LED lights up continuously.



3. When power-up is complete, the OSSD LED lights up green and the mac4 is ready to use.



# SIMPLY SAFE – PROVEN EXPERTISE FROM SICK



## Uncomplicated integration into safety controllers

Just like all of SICK's safety devices, the mac4 safety light curtain was especially developed so that it can be integrated into all standard controllers without additional effort. This means that SICK's industry-leading expertise offers perfect integration into all safety and system environments in the area of machine safety.



## Complete solutions with safetyPLUS®

safetyPLUS® from SICK offers comprehensive solutions for industrial automation – including development and services:

- Application-oriented functions and trend-setting products that increase your system efficiency
- Incorporating the currently applicable international standards in order to support your business all over the world
- Services that range from realization of your ideas through to regular maintenance
- Tools for safety engineering
- A full range of services to support the safety functions in your machines and systems



Visit [www.sick-safetyplus.com](http://www.sick-safetyplus.com) for more information

## THE TAILORED SAFETY SOLUTION



**CE**

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### Product description

SICK's new mac4 safety light curtain features an expandable modular design that can be used in a variety of different machines. The mac4 is based on a modular housing concept and an innovative combination of base, extension and end modules. No blind zone restrictions and a versatile range of assembly options enable the mac4 to be seamlessly

integrated into machines. Featuring the simplest of functions and yet the maximum level of protection, PL e, the mac4 is an ideal cost-efficient solution for protecting small mounting stations. The two resolutions 17 mm and 30 mm offer reliable detection with protective field heights of up to 1,050 mm and scanning ranges of up to 3.2 m.

### At a glance

- Type 4 (IEC 61496), SIL3 (IEC 61496), PL e (EN ISO 13849)
- Modular, expandable housing design with reliable ABS plastic
- No blind zones
- Protective field heights between 210 mm and 1,050 mm
- Scanning range: 0.4 m to 3.2 m
- Resolution: 17 mm and 30 mm
- Direct mounting or with alignment brackets
- Adapter for laser alignment aid AR60

### Your benefits

- Modular, expandable housing design: flexible adjustment to various protective field heights
- Simple, time-saving machine integration due to a versatile range of mounting options
- Direct mounting without brackets for a quick solution
- Innovative adjustable brackets for an efficient alignment for mounting situations without suitable machine frame
- Fast, streamlined commissioning with a 4-pin M12 connecting cable
- Cost-efficient solution for small machines

→ [www.mysick.com/en/mac4](http://www.mysick.com/en/mac4)

For more information, just enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples and much more.



## Detailed technical data

## Features

<b>Resolution</b>	17 mm / 30 mm (depending on type)
<b>Protective field height</b>	210 mm ... 1,050 mm in 105-mm-steps
<b>Scanning range</b>	0.4 m ... 3.2 m
<b>Response time</b>	12 ms ... 20 ms
<b>Synchronization</b>	Electrical

## Safety-related parameters

<b>Type</b>	Type 4 (IEC 61496)
<b>Safety integrity level</b>	SIL3 (IEC 61508) SILCL3 (EN 62061)
<b>Category</b>	Category 4 (EN ISO 13849)
<b>Performance level</b>	PL e (EN ISO 13849)
<b>PFHd (mean probability of a dangerous failure per hour)</b>	$< 1 \times 10^{-8}$ (EN ISO 13849)
<b>T<sub>M</sub> (mission time)</b>	20 years (EN ISO 13849)
<b>Safe state in the event of a fault</b>	At least one OSSD is in the OFF state.

## Interfaces

<b>Connection type</b>	M12, 4-pin
<b>Cable length</b>	≤ 10 m

## Electrical data

	Sender	Receiver
<b>Protection class</b>	III (EN 50178)	
<b>Supply voltage V<sub>s</sub></b>	24 V DC (21 V DC ... 27 V DC)	
<b>Residual ripple</b>	≤ 10 % <sup>1)</sup>	
<b>Power consumption</b>	2 W (DC)	
<b>Safety outputs (OSSD)</b>		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored <sup>2)</sup>
Switching voltage HIGH	-	22.5 V DC (V <sub>s</sub> - 3 V DC ... V <sub>s</sub> )
Switching voltage LOW	-	≤ 2 V DC
Switching current	-	≤ 300 mA

<sup>1)</sup> Within the limits of V<sub>s</sub>.

<sup>2)</sup> Applies to the voltage range between -30 V and +30 V.

Mechanical data

	Sender	Receiver
<b>Housing cross-section</b>	25 mm x 30 mm	
<b>Weight</b>	133 g (± 12 g) ... 589 g (± 32 g) (depending on type)	160 g (± 12 g) ... 616 g (± 32 g) (depending on type)

Ambient data

<b>Enclosure rating</b>	IP 65 (EN 60529)
<b>Ambient operating temperature</b>	0 °C ... +50 °C
<b>Storage temperature</b>	-30 °C ... +70 °C
<b>Air humidity</b>	15 % ... 95 %, non-condensing
<b>Vibration resistance</b>	5 g, 10 Hz ... 55 Hz (EN 60068-2-6)
<b>Shock resistance</b>	10 g, 16 ms (EN 60068-2-29)

## Ordering information

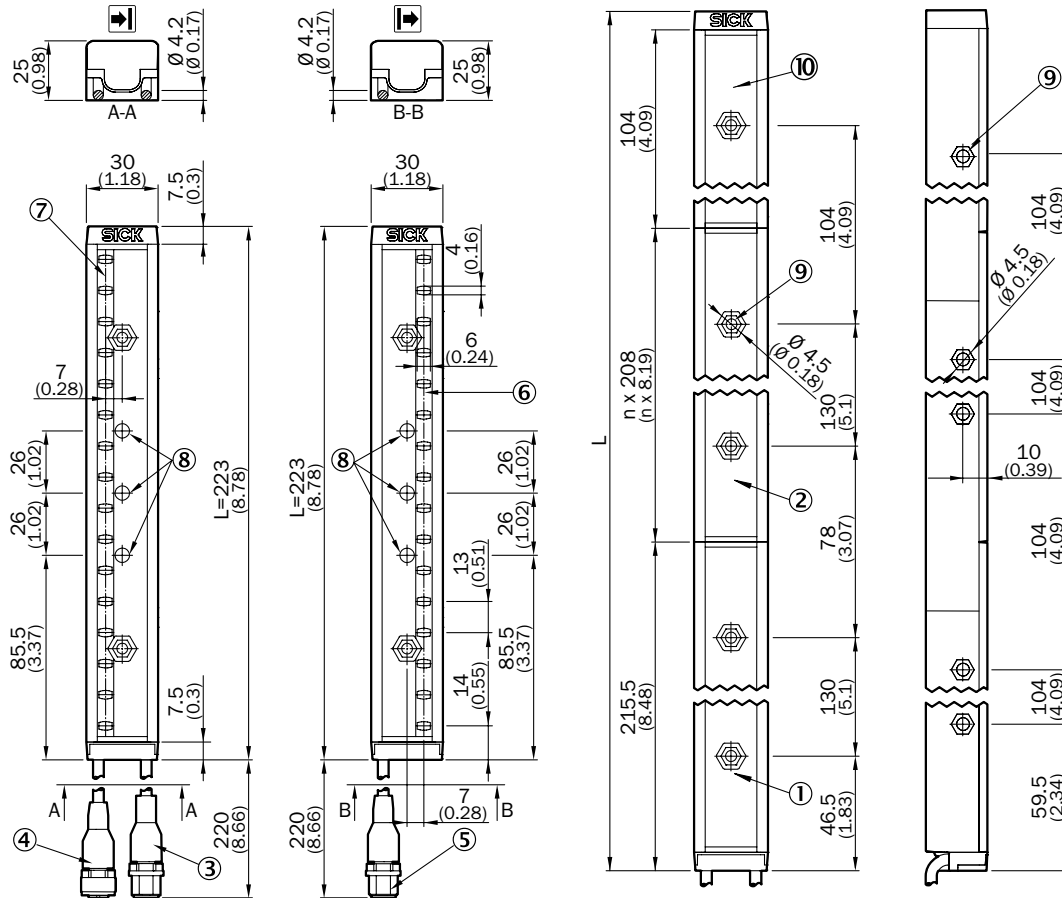
## Selection chart

Resolution	Protective field height	Sender			Receiver		
		Base module	Extension module	End module	Base module	Extension module	End module
17 mm	210 mm	1 x 1060617	-	-	1 x 1060618	-	-
	315 mm	1 x 1060617	-	1 x 1070089	1 x 1060618	-	1 x 1070090
	420 mm	1 x 1060617	1 x 1060619	-	1 x 1060618	1 x 1060620	-
	525 mm	1 x 1060617	1 x 1060619	1 x 1070089	1 x 1060618	1 x 1060620	1 x 1070090
	630 mm	1 x 1060617	2 x 1060619	-	1 x 1060618	2 x 1060620	-
	735 mm	1 x 1060617	2 x 1060619	1 x 1070089	1 x 1060618	2 x 1060620	1 x 1070090
	840 mm	1 x 1060617	3 x 1060619	-	1 x 1060618	3 x 1060620	-
	945 mm	1 x 1060617	3 x 1060619	1 x 1070089	1 x 1060618	3 x 1060620	1 x 1070090
	1.050 mm	1 x 1060617	4 x 1060619	-	1 x 1060618	4 x 1060620	-
30 mm	210 mm	1 x 1060621	-	-	1 x 1060622	-	-
	315 mm	1 x 1060621	-	1 x 1070091	1 x 1060622	-	1 x 1070092
	420 mm	1 x 1060621	1 x 1060623	-	1 x 1060622	1 x 1060624	-
	525 mm	1 x 1060621	1 x 1060623	1 x 1070091	1 x 1060622	1 x 1060624	1 x 1070092
	630 mm	1 x 1060621	2 x 1060623	-	1 x 1060622	2 x 1060624	-
	735 mm	1 x 1060621	2 x 1060623	1 x 1070091	1 x 1060622	2 x 1060624	1 x 1070092
	840 mm	1 x 1060621	3 x 1060623	-	1 x 1060622	3 x 1060624	-
	945 mm	1 x 1060621	3 x 1060623	1 x 1070091	1 x 1060622	3 x 1060624	1 x 1070092
	1.050 mm	1 x 1060621	4 x 1060623	-	1 x 1060622	4 x 1060624	-

## Module types

Resolution	Protective field height	Module	Sender		Receiver	
			Model name	Part no.	Model name	Part no.
17 mm	210 mm	Base module	C4M-SB0221A1BA0	1060617	C4M-EB0221A1BB0	1060618
		Extension module	C4M-SE0211A1AA0	1060619	C4M-EE0211A1AA0	1060620
	105 mm	End module	C4M-SX0101A1AA0	1070089	C4M-EX0101A1AA0	1070090
30 mm	210 mm	Base module	C4M-SB0223A1BA0	1060621	C4M-EB0223A1BB0	1060622
		Extension module	C4M-SE0213A1AA0	1060623	C4M-EE0213A1AA0	1060624
	105 mm	End module	C4M-SX0103A1AA0	1070091	C4M-EX0103A1AA0	1070092

Dimensional drawing (Dimensions in mm (inch))

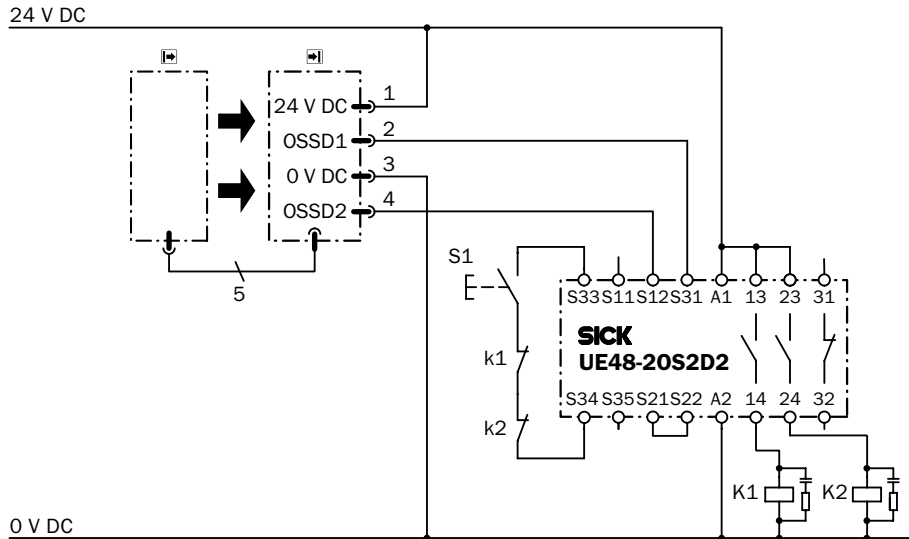


- ① Base module
- ② Extension module
- ③ Connection M12, 4-pin, black
- ④ Connection M12, 5-pin, yellow
- ⑤ Connection M12, 5-pin, yellow
- ⑥ Optical axis, sender
- ⑦ Optical axis, receiver
- ⑧ Status indicators
- ⑨ Mounting holes
- ⑩ End module

Protective field height, rounded	Protective field height (housing length L), exact value
210 (8.27)	223 (8.78)
315 (12.40)	327 (12.87)
420 (16.53)	431 (16.97)
525 (20.67)	535 (21.06)
630 (24.80)	639 (25.16)
735 (28.94)	743 (29.25)
840 (33.07)	847 (33.35)
945 (37.20)	951 (37.44)
1,050 (41.34)	1,055 (41.54)

## Connection diagrams

mac4 safety light curtain connected to UE48-20S safety relay



The mac4 safety light curtain can be connected to the UE48-20S switching amplifiers. It is operated with restart interlock and external device monitoring.

### Functionality

When the protective field is clear, the OSSD1 and OSSD2 outputs carry voltage. The system can be switched on when K1 and K2 are in the de-energized position. Pressing the S1 button switches on the UE48 switching amplifier. Contacts 13–14 and 23–24 of the UE48 activate the K1 and K2 contactors.

When the protective field is interrupted, the OSSD1 and OSSD2 outputs carry no voltage. The UE48 switches off and K1, K2 are deactivated.

### Fault analysis


Failure of K1 and K2 does not cause the loss of the shut-down function. Cross-circuits and shortcircuits of the OSSD1 and OSSD2 outputs are recognized and lead to the locking state. It is recognized if the K1 or K2 contactors does not de-energize.

Accessories

Mounting systems

Terminal and alignment brackets

Alignment brackets

Figure	Description	Model name	Part no.
	2 x alignment bracket for mac4 with protective field height 210 mm, incl. 4 x swivel block with screws and nuts	BEF-2021GT002	2079610
	2 x alignment bracket for mac4 with protective field height 315 mm, incl. 4 x swivel block with screws and nuts	BEF-2031GT002	2079611
	2 x alignment bracket for mac4 with protective field height 420 mm, incl. 4 x swivel block with screws and nuts	BEF-2042GT002	2079612
	2 x alignment bracket for mac4 with protective field height 525 mm, incl. 4 x swivel block with screws and nuts	BEF-2052GT002	2079613
	2 x alignment bracket for mac4 with protective field height 630 mm, incl. 4 x swivel block with screws and nuts	BEF-2063GT002	2079614
	2 x alignment bracket for mac4 with protective field height 735 mm, incl. 4 x swivel block with screws and nuts	BEF-2073GT002	2079615
	2 x alignment bracket for mac4 with protective field height 840 mm, incl. 4 x swivel block with screws and nuts	BEF-2084GT002	2079616
	2 x alignment bracket for mac4 with protective field height 945 mm, incl. 4 x swivel block with screws and nuts	BEF-2094GT002	2079617
	2 x alignment bracket for mac4 with protective field height 1,050 mm, incl. 4 x swivel block with screws and nuts	BEF-2105GT002	2079618
	Mounting kit 1, rotatable, swivel mount, 4 pieces	BEF-2SMKETKU4	2081546

Dimensional drawings → [page 19](#)

Other mounting accessories

Mounting tools

Figure	Description	Model name	Part no.
	For the disassembly of the modules	Unlocking tool	4075862




## Connection systems

### Plug connectors and cables


#### Connecting cables with female connector

Figure	Connection type		Cable length	Model name	Part no.
	Female connector, M12, 4-pin, straight	Open conductor heads	2 m	DOL-1204G02M025KM0	2077084
			5 m	DOL-1204G05M025KM0	2077085
			10 m	DOL-1204G10M025KM0	2077087

#### Connection cables with female connector and male connector

Figure	Connection type		Cable length	Model name	Part no.
	Female connector, M12, 5-pin, straight	Male connector, M12, 5-pin, straight	1 m	DSL-1205G01M025KM0	2077088
			3 m	DSL-1205G03M025KM0	2077089
			5 m	DSL-1205G05M025KM0	2077090

### Power supply units and power cord connectors



Figure	Input voltage	Output voltage	Output current	Model name	Part no.
	100 V AC ... 240 V AC	24 V DC	≤ 2.1 A	Power supply	7028789
			≤ 3.9 A	Power supply	7028790

### Safety relays

Figure	Description	Connection type	Model name	Part no.
	Safety relay with manual/automatic reset and external device monitoring (EDM)	Fixed screw-type terminals	UE48-20S2D2	6024915
		Plug-in screw-type terminals	UE48-20S3D2	6024916

## Reflectors and optics

### Alignment aids

Figure	Description	Model name	Part no.
	Laser alignment aid for various sensors, laser class 2 (IEC 60825): Never look into the beam.	AR60	1015741
	Adapter AR60 for mac4	Adapter AR60, mac4	2080959

### Optics cloths

Figure	Description	Model name	Part no.
	Cloth for cleaning the front screen	Lens cloth	4003353

## Further accessories

### Test and monitoring tools

Figure	Description	Model name	Part no.
	17 mm diameter	Test rod 17 mm	2066238
	30 mm diameter	Test rod 30 mm	2069275
	Test rod holder	BEF-3WNAAAAL1	2052249

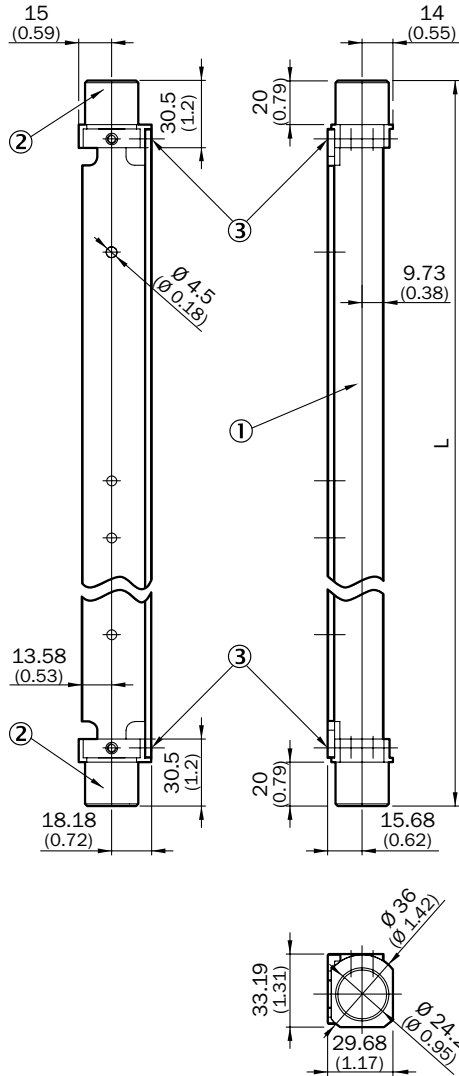
### Cleaning agent

Figure	Description	Model name	Part no.
	Plastic cleaner and care product, anti-static, 0.5 liter	Plastic cleaner	5600006

## Dimensional drawings for accessories (Dimensions in mm (inch))

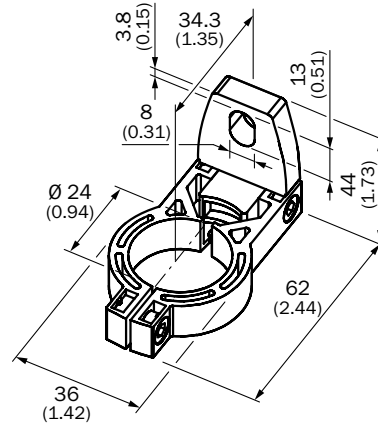
### Terminal and alignment brackets

BEF-2105GT002, BEF-2031GT002, BEF-2042GT002,  
BEF-2052GT002, BEF-2063GT002, BEF-2073GT002,  
BEF-2084GT002, BEF-2094GT002, BEF-2021GT002



- ① Profile rails, L-shaped
- ② Swivel block
- ③ Countersunk screw, tightening torque 1.2 Nm ± 0.2 Nm

### BEF-2SMKETKU4



Protective field height, rounded	L
210 (8.27)	286 (11.26)
315 (12.40)	390 (15.35)
420 (16.54)	494 (19.45)
525 (20.67)	598 (23.54)
630 (24.80)	702 (27.64)
735 (28.94)	806 (31.73)
840 (33.07)	910 (35.83)
945 (37.20)	1,014 (39.92)
1,050 (41.34)	1,118 (44.02)

## SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With almost 7,000 employees and over 50 subsidiaries and equity investments as well as numerous representative offices worldwide, we are always close to our customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in various industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services round out our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

**For us, that is “Sensor Intelligence.”**

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Detailed addresses and additional representatives → [www.sick.com](http://www.sick.com)