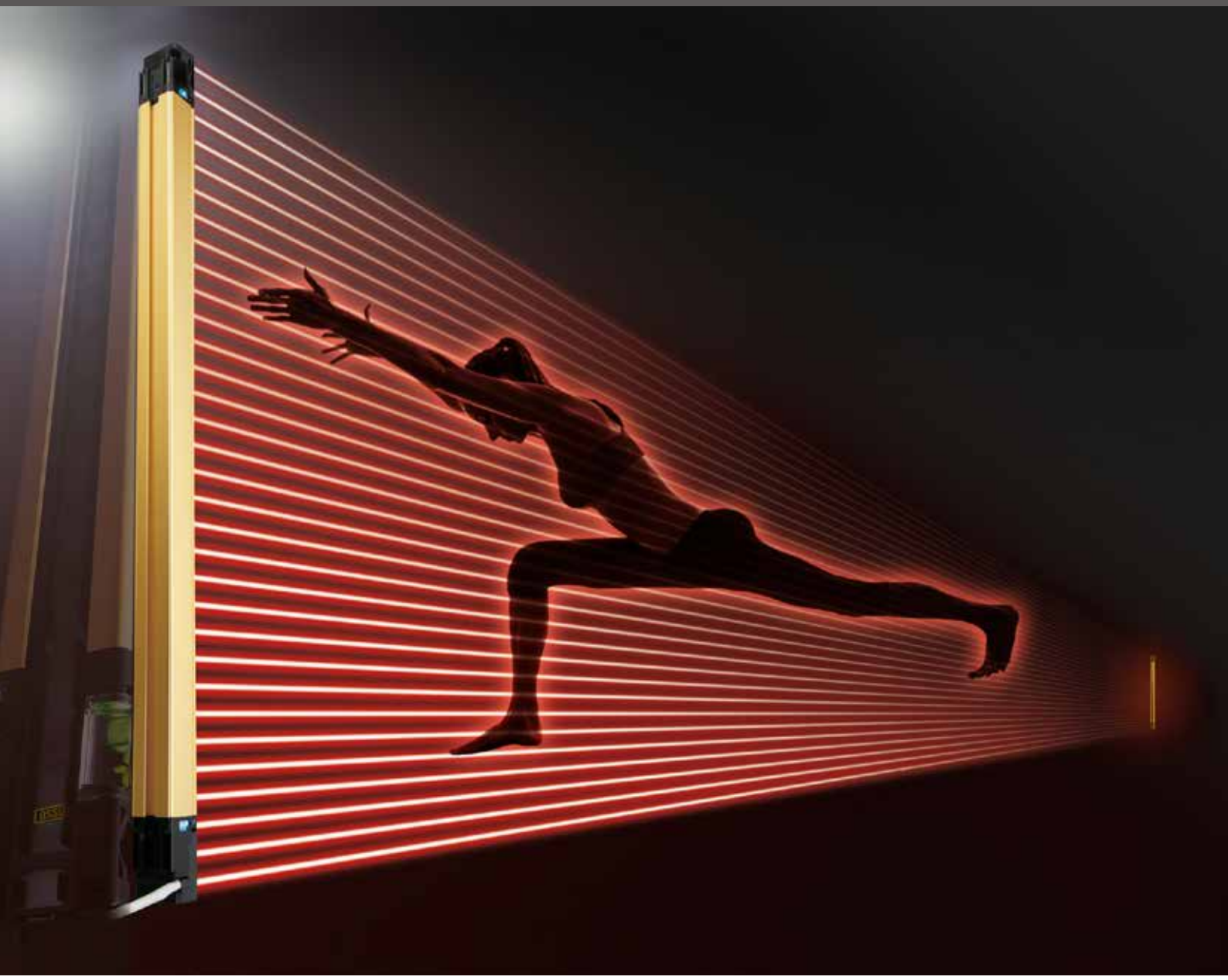
Panasonic

Safety Light Curtain

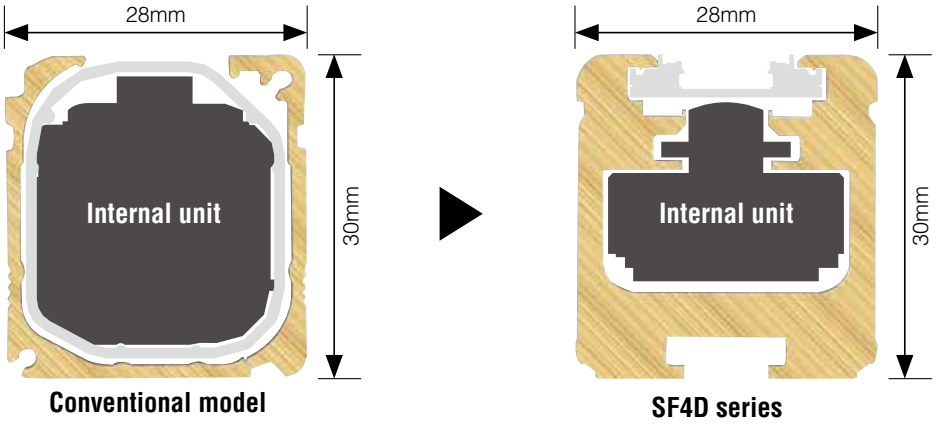
SF4D SERIES



Precise, compact, and robust – Safety light curtains from Panasonic

Higher stability than SF4B thanks to changes to the interior design

Compared to the SF4B<V2> series, the internal unit has been downsized considerably. The volume of the internal unit has been reduced by more than 60%. The volume gained has been used to strengthen the case structure, making it more rigid without changing the outer dimensions. This makes the **SF4D** compatible with the SF4B<V2> series in terms of dimensions.



Twisting- and bending-resistant design

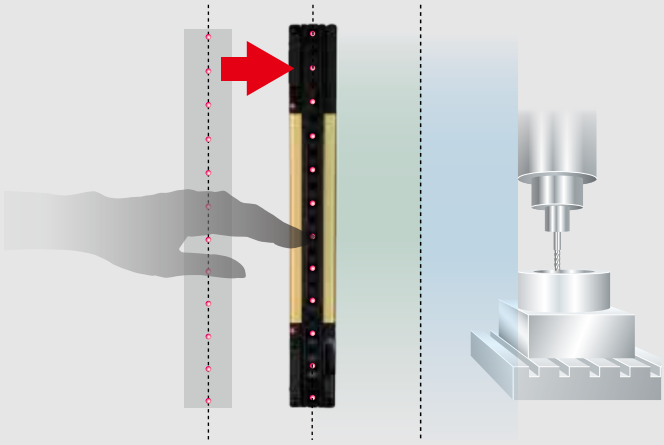
The new interior design makes the safety light curtain more rigid and thus more robust. The **SF4D** does not bend or twist as easily when it comes into contact with other objects.

1. Resists twisting!
2. Resists bending!
3. Resists shock!

Resists twisting! **Resists bending!** **Resists shock!**

Response time max. 10ms for a single light curtain

When only one light curtain is installed, the OFF response time of the control outputs (OSSD1, OSSD2) is max. 10ms, the fastest in its class. For multiple safety light curtains mounted in series, the response time is max. 18ms. Thanks to the fast response it is possible to mount the safety light curtain much closer to the dangerous area.



Easy calculation of safety distance thanks to special no-blind zone design

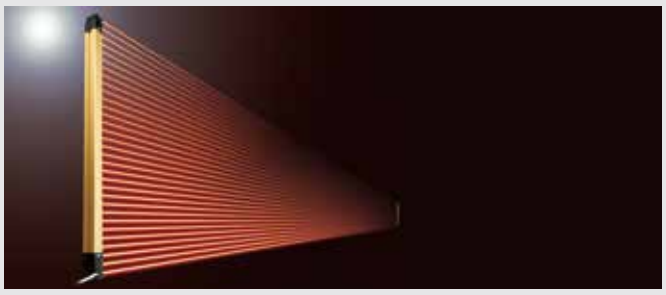
The **SF4D** inherits the no-blind zone design of the SF4B series. Even in an L-shaped or U-shaped layout, the beam pitch does not change (excluding finger protection type). This makes the calculation of the safety distance easier.

Impervious to liquids and dust

The safety light curtain has IP67 and IP65 (IEC) degree of protection and complies with NEMA Type 13 (NEMA: National Electrical Manufacturers Association), a standard to determine how well the enclosures of electronic components resist the infiltration of dust and moisture. For details refer to NEMA 250 “Enclosures for Electrical Equipment (1000 volts Maximum)”.

Easy installation of emitter and receiver thanks to improved optical properties

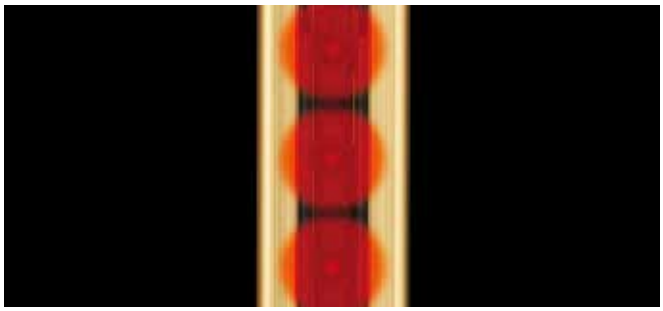
Thanks to a higher emission power, the **SF4D** not only works reliably on shorter distances, but also covers a longer sensing range than previous models.



Sensing range

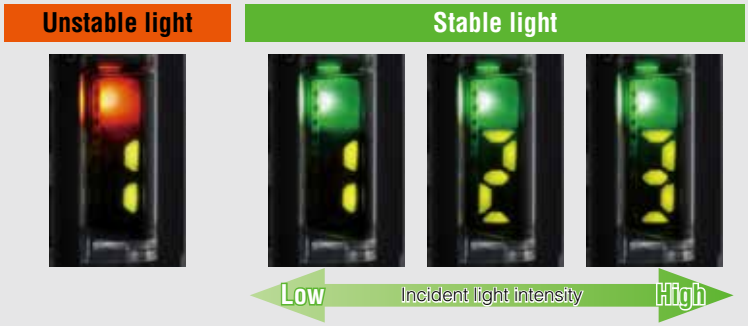
Mode	Type of protection	Sensing range
Short mode (default setting)	Finger protection type	0 to 7m
	Hand protection type Arm / Foot protection type	0 to 9m
Long mode	Finger protection type	0 to 12m
	Hand protection type Arm / Foot protection type	0 to 15m

Please note that installing the front protection cover reduces the sensing range.



Minimizing of deviations among elements

The safety light curtain is equipped with a unique element alignment technology, thus minimizing deviations in the beam axis. Additionally, the LED quality has been improved.



Digital indicator for stable light reception

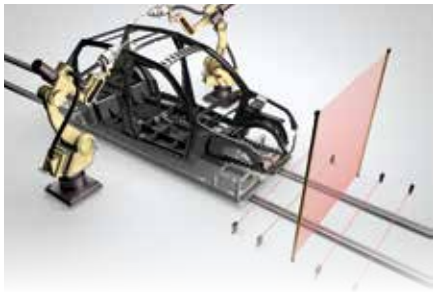
The incident beam intensity indicator (also called stable-light-reception indicator) helps to adjust the beam during installation and to control the light quality during operation. The amount and quality of the light received is indicated by the LED color and a one-digit display. When the LED lights up in orange, the light is unstable. Stable light is indicated by a green LED. The numbers displayed range from 1 to 3. The higher the number, the more stable the light. This way, it is easy to discover and remove errors caused by dirt on the detection surface or beam misalignment.

1. **Incident beam intensity indicator:**
   - Stable light: Lights up green
   - Unstable light: Lights up orange
   - Light blocked: Off

2. **Digital indicator**
   - High level of light received: Displays green “3”
   - Medium level of light received: Displays green “2”
   - Low level of light received: Displays green “1”
   - Light blocked: Off

Selectable synchronization method and cable to suit various applications

With the SF4D, customers can select the synchronization method and cables according to their specific application and requirements. They can choose freely between a basic and a safety-enhanced configuration with improved operability.



Optical synchronization

Optical synchronization is suitable when emitter and receiver are installed far apart.

Synchronization by wiring

Synchronization by wiring (12-core cable) is suitable when the application indicators and the muting function are to be used.

		Optical synchronization		Synchronization by wiring	
	Cable type	**5-core**	**12-core**	**8-core**	**12-core**
Function	Interlock function		Software	✔ (Software)	✔ (Software)
	Lockout release function	✔	✔	✔	✔
	Test input function	✔	✔	✔	✔
	Auxiliary output (non-safety output) function		✔ (Software)	✔ (Software)	✔ (Software)
	External device monitor function		✔ (Software)	✔ (Software)	✔ (Software)
	Muting / Override function		Software		✔ (Software)
	Application indicator function	Software	✔ (Software)	Software	✔ (Software)
	Parallel interference prevention function				Software
	Fix blanking function	Software	Software	Software	Software
	Floating blanking function	Software	Software	Software	Software

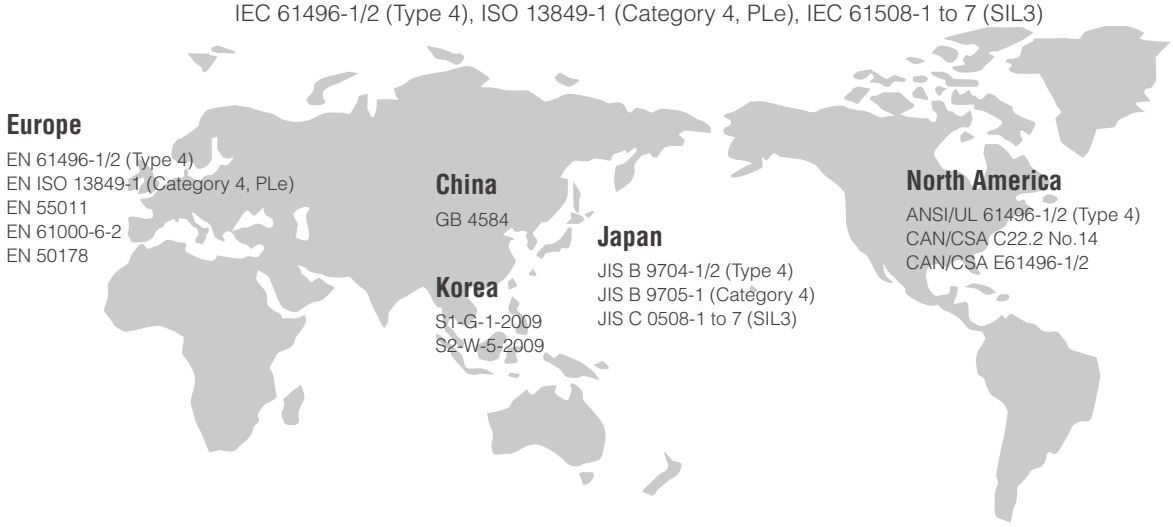
✔: Function is activated by default
Software: Function can be activated in the setting software
✔ (Software): Function is activated by default and can be expanded in the setting software

Compliant with international standards

The **SF4D** series' complies with many international standards and thus can be used anywhere in the world.

International standards

IEC 61496-1/2 (Type 4), ISO 13849-1 (Category 4, PLe), IEC 61508-1 to 7 (SIL3)



Europe
EN 61496-1/2 (Type 4)
EN ISO 13849-1 (Category 4, PLe)
EN 55011
EN 61000-6-2
EN 50178

China
GB 4584

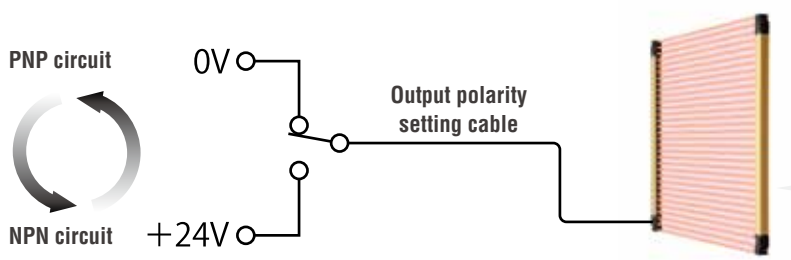
Korea
S1-G-1-2009
S2-W-5-2009

Japan
JIS B 9704-1/2 (Type 4)
JIS B 9705-1 (Category 4)
JIS C 0508-1 to 7 (SIL3)

North America
ANSI/UL 61496-1/2 (Type 4)
CAN/CSA C22.2 No.14
CAN/CSA E61496-1/2

Supports both PNP and NPN polarities

Every model in the **SF4D** series supports both PNP transistor output and NPN transistor output. Thus, the **SF4D** series products are suitable for all types of control circuits used around the world. This feature allows our customers to use the product in many different scenarios, for example when NPN sensors are replaced, when the positive pole is grounded in the factory, when equipment has to be moved to facilities in other countries, etc.



Easy change of polarity by wiring

For a PNP output, connect the output polarity setting wire to 0V.
For an NPN output, connect the output polarity setting wire to +24V.

PNP / NPN polarity indicator
At the time of power ON, the indicator shows the selected polarity (PNP or NPN).

Setting software

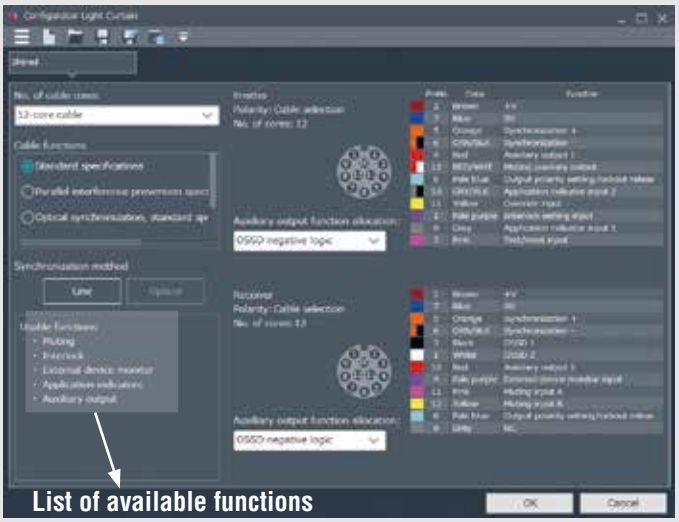
Configurator Light Curtain

The handy controller software, which was well-received by users of our previous models, has evolved. The new setting software **Configurator Light Curtain** allows visually intuitive operation. Apart from providing powerful support during setup of the **SF4D** series, it helps to maintain stable operation and perform troubleshooting. The software saves the error history and allows real-time monitoring of the incident beam intensity.

Main functions

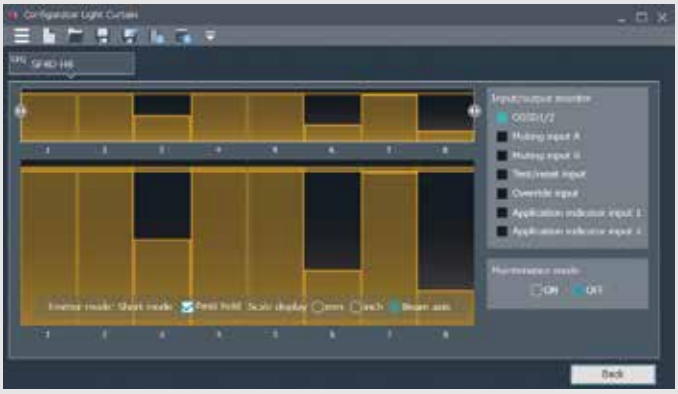
Which functions are available depends on the synchronization method and the type of cables (5-core, 8-core, 12-core) used.

- Operation monitoring
  - Monitoring of the incident beam intensity and extraneous light
  - I/O monitoring
- Error history display
- Light blockage history, unstable light incidence history
- Muting setting function
- Override setting function
- Blanking setting function (both fixed and floating blanking)
- External device monitoring setting function
- Auxiliary output setting function



Monitoring of received light intensity and extraneous light during operation

The monitoring function displays the incident beam intensity of the individual beams in real time. This makes setup much easier and streamlines the maintenance planning as you can see at a glance whether the beams have become misaligned or the light reception has deteriorated, e.g. because the detection surface of the receiver is dirty. In addition, the function also monitors whether a beam of the safety light curtain is influenced by extraneous light to prevent malfunctions in advance.



Muting function

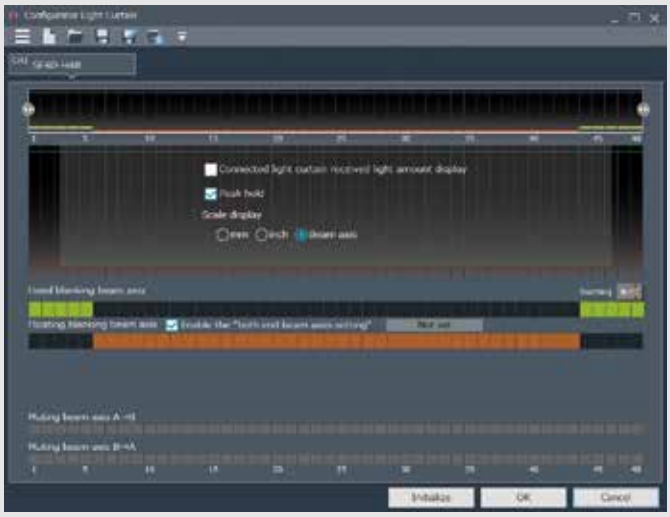
This function is used to set the arrangement of muting sensors and select the most suitable settings. The software displays a time chart reflecting the actual input timing to facilitate adjustments.

Muting mode	Description
Parallel 4-sensor Cross 2-sensor	With this mode, 2 muting sensors or 2 muting sensor pairs are installed sequentially or crosswise. You need to input the time it takes for the workpiece to pass through the protected area.
Exit-only	With this mode, a muting sensor needs to be installed only on the dangerous side. The safe side (exit side) does not need a muting sensor.
Simultaneous input	This is used when the installation conditions do not allow the sensors to be installed sequentially and it is necessary to work with a simultaneous muting sensor input.

Blanking function

The blanking function has also become more advanced. It supports not only manual setting while allowing the user to check the light reception in real time, but also batch setting based on teaching.

Furthermore, fixed blanking and floating blanking can be set using the same screen, making configuration much easier and faster.



Communication unit with copy function

When it is not possible to connect a PC to the safety light curtain, the communication unit can be used to write the setting data to the safety light curtain and also to read error information.

In the office

Check the settings

Communication unit
SF4D-TM1
(optional)

USB2.0 cable
(not included,
connectors A
and Mini-B)

PC

Just take the communication unit with you.

Using only the communication unit

At the installation site

Communication unit → SF4D series

Use the WRITE button on the communication unit to write settings.

WRITE

Write data to another system.

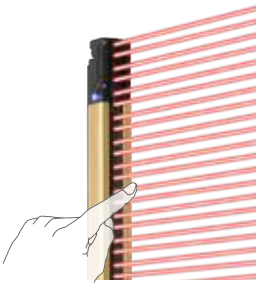
SF4D series → Communication unit

Use the READ button to read settings or error information.

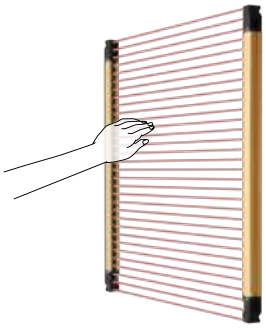
READ

List of options for safety light curtain

Safety light curtain



Finger protection type
Min. object to be sensed ø14mm
(10mm beam pitch)



Hand protection type
Min. object to be sensed ø25mm
(20mm beam pitch)

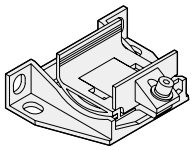
Arm / Foot protection type
Min. object to be sensed ø45mm
(40mm beam pitch)

Sold separately

Mounting bracket

Beam adjustment mounting bracket

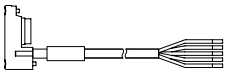
Blind zone-less mounting



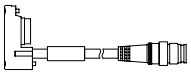
Intermediate supporting bracket

Cable / protective tube

Bottom cap cable

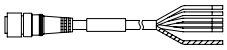


Discrete wire

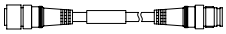


Connector

Extension cable

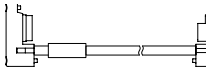


With connector on one end



With connectors on both ends

Cable for series connection

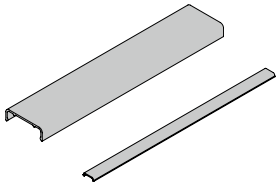


Protective tube

Options

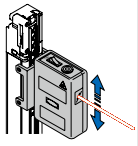
Communication unit

Y-shaped connector



Front protection cover

Corner mirror



Laser alignment tool

Safety control units

Finger protection type (min. object to be sensed ø14mm, 10mm beam pitch)

Model No.	Sensing range	No. of beam channels	Protective height	Beam pitch
SF4D-F15	0 to 7m (short mode) 0 to 12m (long mode) (selectable by DIP switch)	15	150mm	10mm
SF4D-F23		23	230mm	
SF4D-F31		31	310mm	
SF4D-F39		39	390mm	
SF4D-F47		47	470mm	
SF4D-F55		55	550mm	
SF4D-F63		63	630mm	
SF4D-F71		71	710mm	
SF4D-F79		79	790mm	
SF4D-F95		95	950mm	
SF4D-F127		127	1270mm	

Hand protection type (min. object to be sensed ø25mm, 20mm beam pitch)

Model No.	Sensing range	No. of beam channels	Protective height	Beam pitch
SF4D-H8	0 to 9m (short mode) 0 to 15m (long mode) (selectable by DIP switch)	8	150mm	20mm
SF4D-H12		12	230mm	
SF4D-H16		16	310mm	
SF4D-H20		20	390mm	
SF4D-H24		24	470mm	
SF4D-H28		28	550mm	
SF4D-H32		32	630mm	
SF4D-H36		36	710mm	
SF4D-H40		40	790mm	
SF4D-H48		48	950mm	
SF4D-H56		56	1110mm	
SF4D-H64		64	1270mm	
SF4D-H72		72	1430mm	
SF4D-H80		80	1590mm	
SF4D-H88		88	1750mm	
SF4D-H96		96	1910mm	

Arm / Foot protection type (min. object to be sensed ø45mm, 40mm beam pitch)

Model No.	Sensing range	No. of beam channels	Protective height	Beam pitch
SF4D-A4	0 to 9m (short mode) 0 to 15m (long mode) (selectable by DIP switch)	4	150mm	40mm
SF4D-A6		6	230mm	
SF4D-A8		8	310mm	
SF4D-A10		10	390mm	
SF4D-A12		12	470mm	
SF4D-A14		14	550mm	
SF4D-A16		16	630mm	
SF4D-A18		18	710mm	
SF4D-A20		20	790mm	
SF4D-A24		24	950mm	
SF4D-A28		28	1110mm	
SF4D-A32		32	1270mm	
SF4D-A36		36	1430mm	
SF4D-A40		40	1590mm	
SF4D-A44		44	1750mm	
SF4D-A48		48	1910mm	

Mounting brackets

The safety light curtain does not come with a mounting bracket. Please order it separately.

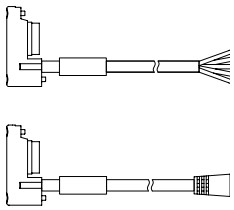
Mounting bracket type	Model No.	Required bolts	Description
Beam adjustment mounting bracket	MS-SFD-1-5	2 M5 or 1 M8 hexagon-socket head bolt(s)	• For rear or side mounting • 4 pieces/set for emitter and receiver • Material: cold-rolled carbon steel (SPCC)
	MS-SFD-1-6	1 M6 hexagon-socket head bolt	
	MS-SFD-1-8	1 M8 hexagon-socket head bolt	
Beam adjustment mounting bracket for installation without blind zones (notes 1 and 2)	MS-SFD-3-6	2 M5 or 2 M6 hexagon-socket head bolts	• For rear or side mounting • 4 pieces/set for emitter and receiver • Material: die-cast zinc alloy
Intermediate supporting bracket (note 3)	MS-SFB-2	2 M5 hexagon-socket head bolts	• Supports the middle of the safety light curtain in locations subject to vibration. • 2 pieces/set for emitter and receiver • Material: die-cast zinc alloy

Notes:
1.) The required number for emitter and receiver varies depending on the number of beam channels.
2.) The mounting brackets must extend beyond the protective height for ensure there is no blind zone.
3.) One set is required when the number of beam channels is more than 111 beam channels for **SF4D-F□**, more than 56 beam channels for **SF4D-H□**, and more than 28 beam channels for **SF4D-A□**.

Cables

The safety light curtain does not come with bottom cap, extension or adapter cables. Please order them separately.

Bottom cap cable



All bottom cap cables are available as 5-core, 8-core, 12-core cables with 2 pieces per set. On the emitter side, the connector is gray. On the receiver side, the connector is black.

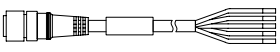
❶ Discrete wire type
❷ Connector type

Cable type		Model No.	Length	Weight	Description
5-core	Discrete wire	SFD-CCB5-S	5m	420g approx. (2 cables)	• Used for connecting the safety light curtain to other cables or the safety control unit SF-C13 / SF-C21 • 2 pieces/set for emitter and receiver
		SFD-CCB10-S	10m	830g approx. (2 cables)	
	Connector	SFD-CB05-S	0.5m	75g approx. (2 cables)	• Used for connecting the safety light curtain to an extension cable • 2 pieces/set for emitter and receiver • Connector outer diameter: max. ø14mm
8-core	Discrete wire	SFD-CCB3	3m	290g approx. (2 cables)	• Used for connecting the safety light curtain to other cables or the safety control unit SF-C13 / SF-C21 • 2 pieces/set for emitter and receiver
		SFD-CCB7	7m	620g approx. (2 cables)	
		SFD-CCB10	10m	900g approx. (2 cables)	
		SFD-CCB15	15m	1300g approx. (2 cables)	
	Connector	SFD-CB05	0.5m	80g approx. (2 cables)	• Used for connecting the safety light curtain to an extension cable or the safety control unit SF-C11 • 2 pieces/set for emitter and receiver • Connector outer diameter: max. ø14mm
		SFD-CB5	5m	480g approx. (2 cables)	
		SFD-CB10	10m	950g approx. (2 cables)	
12-core	Discrete wire	SFD-CCB3-MU	3m	340g approx. (2 cables)	• Used for connecting the safety light curtain to other cables or the safety control unit SF-C13 / SF-C21 • 2 pieces/set for emitter and receiver
		SFD-CCB7-MU	7m	700g approx. (2 cables)	
		SFD-CCB10-MU	10m	980g approx. (2 cables)	
	Connector	SFD-CB05-MU	0.5m	95g approx. (2 cables)	• Used for connecting the safety light curtain to an extension cable • 2 pieces/set for emitter and receiver • Connector outer diameter: max. ø16mm

Extension cables

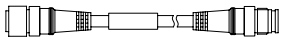
All extension cables are available as 5-core, 8-core, 12-core cables. Note that the number of wires in an extension cable must match the number of wires in the bottom cap cable to be extended.

Extension cables: with connector on one end



Type	Model No.	Length	Weight	Description
5-core	SFD-CC3-S	3m	260g approx. (2 cables)	• Used for connecting the safety light curtain to an extension cable or the safety control unit SF-C13 / SF-C21 • 2 pieces/set for emitter and receiver • Connector outer diameter: max. ø14mm
	SFD-CC10-S	10m	830g approx. (2 cables)	
8-core	SFD-CC3	3m	290g approx. (2 cables)	
	SFD-CC10	10m	620g approx. (2 cables)	
12-core	SFD-CC3-MU	3m	340g approx. (2 cables)	• Used for connecting the safety light curtain to an extension cable or the safety control unit SF-C13 / SF-C21 • 2 pieces/set for emitter and receiver • Connector outer diameter: max. ø16mm
	SFD-CC7-MU	7m	700g approx. (2 cables)	
	SFD-CC10-MU	10m	980g approx. (2 cables)	

Extension cables: with connectors on both ends



Type		Model No.	Length	Weight	Description
5-core	For emitter (gray connector)	SFD-CCJ10E-S	10m	420g approx. (1 cable)	• Used for connecting the safety light curtain to an extension cable • 1 cable for emitter, 1 cable for receiver • Connector outer diameter: max. ø14mm
	For receiver (black connector)	SFD-CCJ10D-S	10m	440g approx. (1 cable)	
8-core	For emitter (gray connector)	SFB-CCJ3E	3m	190g approx. (1 cable)	• Used for connecting the safety light curtain to an extension cable or the safety control unit SF-C11 • 1 cable for emitter, 1 cable for receiver • Connector outer diameter: max. ø14mm
		SFB-CCJ10E	10m	580g approx. (1 cable)	
	For receiver (black connector)	SFB-CCJ3D	3m	210g approx. (1 cable)	
		SFB-CCJ10D	10m	600g approx. (1 cable)	
12-core	For emitter (gray connector)	SFB-CCJ3E-MU	3m	190g approx. (1 cable)	• Used for connecting the safety light curtain to an extension cable • 1 cable for emitter, 1 cable for receiver • Connector outer diameter: max. ø14mm
		SFB-CCJ10E-MU	10m	660g approx. (1 cable)	
	For receiver (black connector)	SFB-CCJ3D-MU	3m	210g approx. (1 cable)	
		SFB-CCJ10D-MU	10m	680g approx. (1 cable)	

Cable for series connection

Model No.	Length	Net weight	Description
SFD-CSL005	0.05m	35g approx. (2 cables)	• Used for connecting the safety light curtain in series. If this device is to be installed in an L-shaped layout, we recommend using a cable with a minimum length of 0.1m. • 2 pieces/set for emitter and receiver (common for emitter and receiver) • Cable color: gray with black line (common for emitter and receiver) • The minimum bending radius is 6mm. However, when the protective tube SFPD-A10 is attached, the minimum bending radius of the cable is 55mm.
SFD-CSL01	0.1m	40g approx. (2 cables)	
SFD-CSL05	0.5m	80g approx. (2 cables)	
SFD-CSL1	1m	130g approx. (2 cable)	
SFD-CSL5	5m	480g approx. (2 cables)	
SFD-CSL10	10m	950g approx. (2 cables)	

Adapter cable

Type	Model No.	Length	Net weight	Description
For SF4-AH□ (PNP type)	SFD-CB05-A-P	0.5m	80g approx. (2 cables)	• Used to allow connector cables attached to older series of safety light curtains at the control circuit side to be connected to the SF4D series • 2 pieces/set for emitter and receiver • Connector outer diameter: max. ø14mm • The minimum bending radius is 6mm. However, when the protective tube SFPD-A10 is attached, the minimum bending radius of the cable is 55mm.
For SF4-AH□-N (NPN type)	SFD-CB05-A-N			

Note: Where the cable color has not been specified, it is black for emitter, gray with black line for the receiver.

Protective tube

Model No.	Length	Net weight	Description
SFPD-A10	10m	220g approx. (1 cable)	• Outer diameter: ø18mm, inner diameter: ø9mm • Minimum bending radius: 55mm • Material: Polycarbonate

Safety control units

Type of safety control unit	Model No.	Compatible cables
Standard type	SF-C21	• Bottom cap cable: SFD-CCB☐ Extension cable: SFD-CC☐
Connector type	SF-C11	• Bottom cap cable: SFD-CB☐ Extension cable: SFB-CCJ☐
Slim type	SF-C13	• Bottom cap cable: SFD-CCB☐ Extension cable: SFD-CC☐

Recommended safety relays

The recommended relays are equipped with an LED indicator.

Model No.	SFS3-L-DC24V	SFS4-L-DC24V
Contact arrangement	3a1b	4a2b
Rated switching capacity	6A/250V AC, 6A/30V DC	
Min. switching capacity	1mA/5V DC	
Coil power	15mA/24V DC	20.8mA/24V DC
Rated power consumption	360mW	500mW
Operation time	Max. 20ms	
Release time	Max. 20ms	
Ambient temperature	-40 to +85°C (humidity: 5 to 85% RH)	
Applicable standards	UL, C-UL, TUV, Korea's S-mark	

Model No.	SFS SET
Description	Safety relays set (two relays **SFS4-L-DC24V-D** and two sockets **SFS6SFDJ**) for light curtains

Communication unit

The communication unit acts as an interface between a PC and a safety light curtain of the **SF4D** series. It has two functions: You can use it to change settings and monitor the status of **SF4D** safety light curtains with a PC or you can copy settings from one safety light curtain to another without a PC. The communication unit connects to the PC with a USB cable (USB2.0, connectors A and Mini-B, not included) and to the safety light curtains with the cable attached.

If you want to use the **SF4D-TM1** communication unit with a PC, you need to install the setting software "Configurator Light Curtain", which can be downloaded for free from our website.

Common specifications

Type		Finger protection type	Hand protection type	Arm / Foot protection type
		Min. object to be sensed ø14mm (10mm beam pitch)	Min. object to be sensed ø25mm (20mm beam pitch)	Min. object to be sensed ø45mm (40mm beam pitch)
Model No.		SF4D-F□	SF4D-H□	SF4D-A□
Applicable standards	International standards	IEC 61496-1/2 (Type 4), ISO 13849-1 (Category 4, PLe), IEC 61508-1 to 7 (SIL3)		
	Japan	JIS B 9704-1/2 (Type 4), JIS B 9705-1 (Category 4), JIS C 0508-1 to 7 (SIL3)		
	Europe (EU)	EN 61496-1/2 (Type 4), EN ISO 13849-1 (Category 4, PLe), EN 55011, EN 61000-6-2, EN 50178		
	North America	ANSI/UL 61496-1/2 (Type 4), CAN/CSA C22.2 No.14, CAN/CSA E61496-1/2		
	South Korea (S-Mark)	S1-G-1-2009, S2-W-5-2009		
	China (GB)	GB 4584		
Applicable CE marking directive		Machinery Directive, EMC Directive, RoHS Directive		
Sensing range		0 to 7m (short mode) 0 to 12m (long mode) (selectable by DIP switch)	0 to 9m (short mode) 0 to 15m (long mode) (selectable by DIP switch)	
Min. object to be sensed (note 2)		ø14mm opaque object	ø25mm opaque object	ø45mm opaque object
Effective aperture angle		Max. ±2.5° at a sensing range of min. 3m (based on IEC 61496-2)		
Supply voltage		24V DC +20/-30% including ripple max. 10% (P-P) (excluding voltage drop when cable is removed)		
Control outputs (OSSD 1, OSSD 2)		**PNP open-collector transistor / NPN open collector transistor (selectable)** **PNP output selected:** Maximum source current: 350mA Applied voltage: Same as supply voltage (between control output and +V) Residual voltage: max. 2V (source current 350mA) (excluding voltage drop due to cable) Leakage current: max. 0.2mA (including power OFF state) Maximum load capacity: 2.2µF Load wiring resistance: max. 3Ω **NPN output selected:** Maximum sink current: 350mA Applied voltage: Same as supply voltage (between control output and 0V) Residual voltage: max. 2V (sink current 350mA) (excluding voltage drop due to cable) Leakage current: max. 0.2mA (including power OFF state) Maximum load capacity: 2.2µF Load wiring resistance: max. 3Ω		
	Operation mode	ON when all beams are received, OFF when one or more beams are blocked (also OFF when an internal sensor error or synchronization signal error occurs)		
	Protection circuit	Incorporated		
	Response time	OFF response: max. 10ms (when not connected in series / parallel), max. 18ms (when connected in series / parallel) ON response: max. 50ms (note 3 and 4)		
Auxiliary output (AUX) (non-safety output)		PNP open-collector transistor / NPN open collector transistor (selectable)		
Synchronization method		Synchronization by wiring / optical synchronization (selectable by DIP switch)		
Interference prevention function		**Not connected in series / parallel:** Synchronization by wiring: max. 2 units (auto) Optical synchronization: max. 2 units (selectable by DIP switch) **Connected in series / parallel:** Series connection: max. 5 units (total number of beam channels max. 256) Parallel connection: max. 3 units (total number of beam channels max. 192) Series / parallel connection mixed: max. 5 units (total number of beam channels max. 144)		
Test input function		Incorporated		
Interlock function		Incorporated Manual reset / auto reset: selectable by wiring Use 8-core cable or 12-core cable		
Lockout release function		Incorporated		
External device monitor function		Incorporated (use 8-core cable or 12-core cable)		
Muting function		Incorporated (use 12-core cable)		
Override function		Incorporated (use 12-core cable)		
Degree of protection		IP67, IP65 (IEC), NEMA Type 13 (NEMA 250)		
Ambient temperature		-10 to +55°C (No dew condensation or icing allowed), storage: -25 to 60°C		
Accessories		SF4B-TR14 (Test rod): 1 pc.	SF4B-TR25 (Test rod): 1 pc.	-

Notes:
1.) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20°C.
2.) When the floating blanking function is used, the minimum size of the object to be sensed becomes larger.
3.) Because the control output (OSSD 1 / 2) must be OFF for at least 80ms, the ON response will be delayed more than 50ms when the light blocked time is less than 30ms.
4.) When optical synchronization is selected, if the beam axes of both the top end and bottom end are blocked, the ON response speed decreases by as much as 1 second.

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