

POC Type 4 Safe 4

Description

The Allen Bradley Guardmaster GuardShield Safe 4 is an economical two box, Type 4 safety light curtain with ON/OFF functionality. This basic, guard-only operating mode, safety light curtain has an Integrated Laser Alignment system that simplifies the alignment of each pair of light curtains. Visible laser beams are activated by touching the laser at the finger symbol on front face of the light curtains. Positioning of the transmitter and receiver laser beams to their respective targets facilitates optimal alignment of each Safe 4 pair. The Integrated Laser Alignment system also quickly helps with the re-alignment of pairs when units are knocked out of alignment during the course of the work process or when corner mirrors are used.

The GuardShield Safe 4 is designed to be used in a variety of applications across a broad range of industries in medium to heavy industrial environments. Offered with shock isolator kits for shock and vibration applications and protective heights from 120...1920 mm in 120 mm increments assures that the correct size of safety light curtain is available to suit the application requirement.

The GuardShield Safe 4, with an environmental rating of IP65, meets all applicable global standards and can be used on or around industrial machinery and equipment anywhere in the world.



Features

- M12 connectors
- Optically synchronized
- Integrated laser alignment system
- IP65 enclosure rating
- Simple installation
- cULus Listed and CE Marked for all applicable directives

Applications

- Metal working
- Shears
- Punch presses
- Robot cells
- Automated processes

Specifications

Safety Ratings	
Standards	EN/IEC 61496 Parts 1 and 2, UL 61496 Parts 1 and 2, UL1998
Safety Classification	Type 4 per IEC/EN61496. Category 4 device per EN 954-1, SIL 3 per IEC 61508, PLe per EN/ISO 13849, EN/IEC 61496-1, -2, UL 61496-1, -2, UL 1998
Certifications	cULus Listed and CE Marked for all applicable directives
Power Supply	
Input Power, Max.	24V DC \pm 20%
Maximum Residual Ripple	< 10% of U_{sp}
Power Consumption	<500 mA (no load)
Outputs	
Safety Outputs	2 PNP OSSD. 0.3 A, short-circuit protected
Output Voltage	U_{sp} -1V (at load = 0.1 A)
Switching Current @ Voltage, Min.	300 mA @ 24V DC
Operating Characteristics	
Response Time	Varies by protective height, see Installation Manual
Indicator LEDs	ON -State, OFF-State, internal error
Protected Height [mm (in.)]	120...1920 mm (4.7...75.6 in.) in 120 mm (4.7 in.) increments
Resolution [mm (in.)]	14 mm (0.55 in.) 30 mm (1.18 in.)
Scanning Range	14 mm: 0...9 m (0...29.7 ft) 30 mm: 0...18 m (0...59 ft) [standard version]; 5...30 m (16.4...98.4 ft) [long range version]
Synchronization	Optical, first beam adjacent to LEDs
Wavelength	940 nm
Environmental	
Enclosure Type Rating	IP65
Relative Humidity	15...95% (noncondensing)
Operating Temperature [C (F)]	0...55° (0...131°)
Vibration	IEC 60068-2-6 frequency 10...55 Hz; amplitude 0.35 mm (0.01 in.)
Shock	IEC 60068-2-29; acceleration 10 g, pulse duration 16 ms 10...55 Hz; amplitude 0.35 mm (0.01 in.)
Physical Characteristics	
Mounting	Rear mounting, standard and adjustable (180°)
Weight	Varies by protective height, see Installation Manual
Housing Cross Section	30 x 40 mm (1.18 x 1.57 in.)
Connection Type	Transmitter: 5-pin M12 micro QD Receiver: 5-pin M12 micro QD
Cable Length	30 m (98.4 ft) max.
ILAS Laser Class	Class 2, IEC 60825-1

Product Selection

Safety Light Curtain—POC System

The Allen-Bradley Guardmaster GuardShield Safe 4 safety light curtains are offered in 14 mm and 30 mm resolutions, are ordered as pairs—transmitter and receiver—and are shipped under one cat. no. Each GuardShield Safe 4 pair is shipped with standard mounting brackets. After selecting the appropriate Safe 4 protected height, range and resolution, ensure that the appropriate cordsets, interfaces, and accessories are ordered.

Protected Height [mm (in.)]	14 mm (0.55 in.) Number of Beams	30 mm (1.18 in.) Number of Beams	Pair Weight [kg (lbs)]	Cat. No.		
				14 mm (0.55 in.)	30 mm (1.18 in.) standard range: 0...18 m (0...59 ft)	30 mm (1.18 in.) long range: 5...30 m (16.4...98.4 ft)
120 (4.7)	16	8	1.0 (2.2)	445L-P4L0120YD	445L-P4S0120YD	445L-P4X0120YD
240 (9.4)	32	16	1.4 (3.1)	445L-P4L0240YD	445L-P4S0240YD	445L-P4X0240YD
360 (14.2)	48	24	1.8 (4.0)	445L-P4L0360YD	445L-P4S0360YD	445L-P4X0360YD
480 (19.9)	64	32	2.2 (4.9)	445L-P4L0480YD	445L-P4S0480YD	445L-P4X0480YD
600 (23.6)	80	40	2.6 (5.7)	445L-P4L0600YD	445L-P4S0600YD	445L-P4X0600YD
720 (28.3)	96	48	3.0 (6.6)	445L-P4L0720YD	445L-P4S0720YD	445L-P4X0720YD
840 (33.1)	112	56	3.5 (7.7)	445L-P4L0840YD	445L-P4S0840YD	445L-P4X0840YD
960 (37.8)	128	64	4.0 (8.8)	445L-P4L0960YD	445L-P4S0960YD	445L-P4X0960YD
1080 (42.5)	144	72	4.0 (8.8)	445L-P4L1080YD	445L-P4S1080YD	445L-P4X1080YD
1200 (47.2)	160	80	4.5 (9.9)	445L-P4L1200YD	445L-P4S1200YD	445L-P4X1200YD
1320 (52.0)	176	88	5.0 (11.0)	445L-P4L1320YD	445L-P4S1320YD	445L-P4X1320YD
1440 (56.7)	192	96	5.5 (12.1)	445L-P4L1440YD	445L-P4S1440YD	445L-P4X1440YD
1560 (61.4)	208	104	6.0 (13.2)	445L-P4L1560YD	445L-P4S1560YD	445L-P4X1560YD
1680 (66.1)	224	112	6.5 (14.3)	445L-P4L1680YD	445L-P4S1680YD	445L-P4X1680YD
1800(70.9)	240	120	7.0 (15.4)	445L-P4L1800YD	445L-P4S1800YD	445L-P4X1800YD
1920 (75.6)	256	128	7.5 (16.5)	445L-P4L1920YD	445L-P4S1920YD	—

Note: The cat. nos. listed above are pair cat. nos., to specify a transmitter or receiver only, replace the "P" in the cat. no. with a "T" for transmitter or an "R" for receiver.



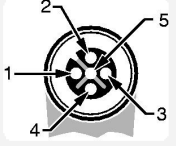
ATTENTION: The 30 mm long range POC systems with 5...30 m (16.4...98.4 ft) operating range are designed as a long range system and cannot be used in applications with less than 5 m (16.4 ft) operating range.

Required Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays for 2 N.C. Contact Switch							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	MSR127RP/TP	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	MSR127RP/TP	440R-N23132
MSR126	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	MSR126R/T	440R-N23117
Modular Safety Relays							
MSR211P Base 2 N.C. only	2 N.O.	1 N.C.	Removable	Auto./Manual or Monitored Manual	24V DC from the base unit	MSR211P	440R-H23177
MSR221P Input Module	—	—	Removable	—	24V DC from the base unit	MSR221P	440R-H23179
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	MSR310P	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	MSR320P	440R-W23218
Muting Modules							
MSR22LM	2 N.O.	1 N.C.	Removable	Auto./Manual	24V DC	MSR22LM	440R-P23071
MSR42 (requires optical interface to configure 445L-AF6150)	2 PNP	2 PNP, configurable	Removable	Auto./manual or manual monitored	24V DC	MSR42 Micro 400 Controller/Muting Module	440R-P226AGS-NNR
Muting Box	2 PNP	2 PNP	M12/5-pin M12/8-pin	Manual (Auto. configurable)	24V DC	Muting Controller Box	445L-AMUTBOX1

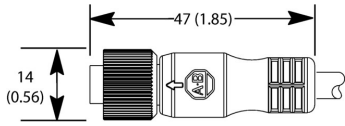
Cordsets—Transmitters and receivers both use 5-pin M12 cordsets

Note: Unshielded cordsets are most commonly used for safety light curtains, however, shielded cordsets are also offered to increase immunity to electrical interference.

Female Connector (Sensor End)		Cable			Cat. No.
Face View of Female	Connector Style	Pin/Wire Color	Wire Rating	Length [m (ft)]	
	Straight Female Nonshielded	1 Brown 2 White 3 Blue 4 Black 5 Grey	22 AWG 250V 4 A	2 (6.56)	889D-F5AC-2
				5 (16.4)	889D-F5AC-5
				10 (32.8)	889D-F5AC-10
				15 (49.2)	889D-F5AC-15
				20 (65.6)	889D-F5AC-20
	Shielded Straight Female	1 Brown 2 White 3 Blue 4 Black 5 Grey	22 AWG 300V 4 A	2 (6.56)	889D-F5FC-J2
				5 (16.4)	889D-F5FC-J5
				10 (32.8)	889D-F5FC-J10
				15 (49.2)	889D-F5FC-J15
				20 (65.6)	889D-F5FC-J20
			30 (98.4)	889D-F5FC-J30	












Cordsets Approximate Dimensions [mm (in.)]

Dimensions are not intended to be used for installation purposes.



Straight Female



Optional Accessories

Description		Cat. No.
 Standard kit (4 pieces – supplied with each pair)		445L-AF6140
 180° Adjustable kit (two kits required per pair)		445L-AF6141
 Shock Mount Kit (2 kits required per pair of light curtains)		445L-AF6142
 Vertical mounting kit (two kits required per pair)		445L-AF6144
 MSR42 Multifunction Module (requires Cat. No. 440L-AF6150 to program)		440R-P226AGS-NNR
 MSR45E – Safety relay expansion module for MSR42		440R-P4NANS
 USB optical interface software configuration tool used to configure the MSR42 (Used to configure the MSR42 module or get diagnostic information from the Safe 4.)		445L-AF6150
 Ribbon cable – to connect one MSR45E to an MSR42		440R-ACABL1
 Ribbon cable – to connect two MSR45Es to an MSR42		440R-ACABL2
 Ribbon cable – to connect three MSR45Es to an MSR42		440R-ACABL3
 Mounting stand		440L-AMSTD
		445L-AMSTD2M

Corner Mirror for Multi-Sided Guarding

Specially constructed glass mirrors for 2- and 3-sided safeguarding applications.

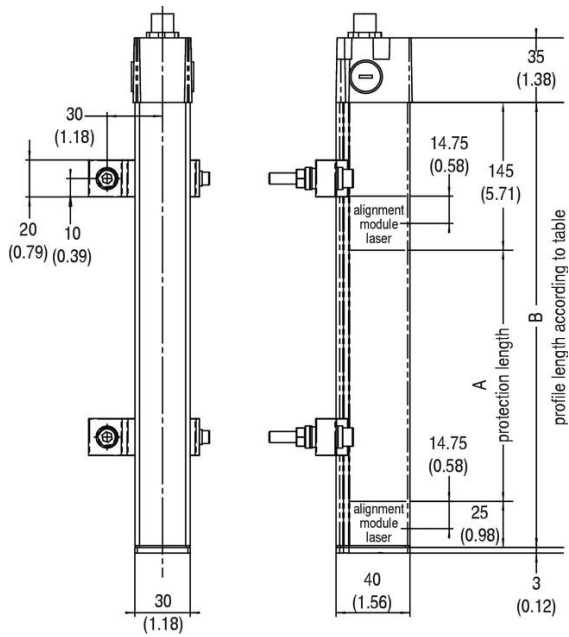
Note: Each mirror reduces maximum scan range by approximately 15% per mirror.

GuardShield Safe 2/Safe 4 Protected Height [mm (in.)]	Narrow Mirror Short-Range 0...4 m	Cat. No.	Wide Mirror Long-Range 4...15 m	Cat. No.
120/240 (4.7/9.4)		440L-AM0750300		440L-AM1250300
360 (14.2)		440L-AM0750450		440L-AM1250450
480 (19)		440L-AM0750600		440L-AM1250600
600 (24)		440L-AM0750750		440L-AM1250750
720/840 (28/33)		440L-AM0750900		440L-AM1250900
960 (38)		440L-AM0751050		440L-AM1251050
1080 (43)		440L-AM0751200		440L-AM1251200
1200 (47)		440L-AM0751350		440L-AM1251350
1320/1440 (52/57)		440L-AM0751500		440L-AM1251500
1560 (61)		440L-AM0751650		440L-AM1251650
1680 (66)		440L-AM0751800		440L-AM1251800
1800/1920 (70.9/75.6)		Not available		Not available

Approximate Dimensions

Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes.

Safe 4

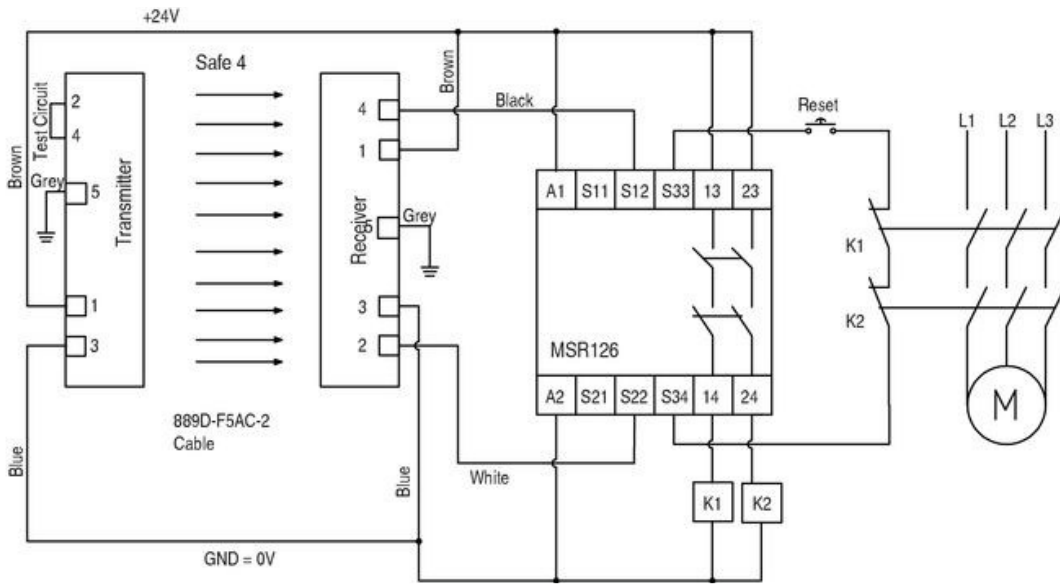


Type	A Protective Height [mm (in.)]	B Profile Length [mm (in.)]
445L-P4* 0120YD	120 (4.7)	290 (11.4)
445L-P4* 0240YD	240 (9.4)	410 (16.1)
445L-P4* 0360YD	360 (14.2)	530 (20.9)
445L-P4* 0480YD	480 (18.9)	650 (25.6)
445L-P4* 0600YD	600 (23.6)	771 (30.4)
445L-P4* 0720YD	720 (28.3)	891 (35.1)
445L-P4* 0840YD	840 (33.1)	1011 (39.8)
445L-P4* 0960YD	960 (37.8)	1131 (44.5)
445L-P4* 1080YD	1080 (42.5)	1252 (49.3)
445L-P4* 1200YD	1200 (47.2)	1372 (54.0)
445L-P4* 1320YD	1320 (51.9)	1492 (58.7)
445L-P4* 1440YD	1440 (56.7)	1612 (63.5)
445L-P4* 1560YD	1560 (61.4)	1733 (68.2)
445L-P4* 1680YD	1680 (66.1)	1853 (72.9)
445L-P4* 1800YD	1800 (70.8)	1973 (77.7)
445L-P4* 1920YD	1920 (75.6)	2093 (82.4)

* For 14 mm resolution replace with an "L." For 30 mm standard resolution (0...18 m (0...59 ft) range), replace with an "S." For 30 mm long range resolution (5...30 m (16.4...98.4 ft) range), replace with an "X." Example: Cat. No. 445L-P4S0480YD (for 30 mm standard resolution).

Wiring Diagram for Connection to MSR126

Wiring diagram is not intended to be used for installation purposes.



Wiring Diagram for Connection to MSR127

