POC Type 2 Safe 2

Description

The Allen-Bradley Guardmaster GuardShield Safe 2 safety light curtain is a new addition to the Allen-Bradley Guardmaster portfolio of opto-electronic safety devices. The "Type 2" designation means that this particular safety light curtain meets a lesser requirement for performance under fault conditions than the GuardShield Type 4 safety light curtains. As a result, the GuardShield Type 2 safety light curtain can only be applied in applications where a formal risk assessment has determined that a Type 2 device is sufficient to meet the level of risk posed by the hazard.

The GuardShield Safe 2 safety light curtain is a self-contained two-box, safety light curtain in a robust housing with an integrated laser alignment system. The integrated laser alignment system generates two visible beams of light which simplifies alignment of the light curtain pair.

This economical opto-electronic Type 2 safety light curtain is offered in a guard-only mode of operation and is designed for use on or around machinery or equipment where a formal risk assessment has determined that a Type 2 safety device is of a sufficient level of safety to meet the guarding application.

> ⚠️ **ATTENTION:** Safety light curtains of a Type 2 level of safety typically do not meet OSHA or ANSI requirements of "Control Reliability," therefore it is not allowable to use a safety device of a Type 2 level on or around equipment or machinery that requires "Control Reliability."

Features

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

Applications

- Conveyors
- Textile machinery
- Automatic storage and retrieval machinery
- Automated assembly lines

Specifications

Safety Ratings	
Standards	IEC/EN61496 Parts 1 and 2, UL61496 Parts 1 and 2, UL1998
Safety Classification	Type 2 per IEC/EN61496. Category 2 device per EN 954-1, SIL 2 per IEC 61508, PLd per EN/ISO 13849
Certifications	**cULus Listed, TÜV, and CE Marked for all applicable directives**
Power Supply	
Input Power, Max.	**24V DC ± 20% (U_{sp})**
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, Min.	U_{sp} -1
Switching Current @ Voltage, Min.	300 mA @ 24V DC
Operating Characteristics	
Response Time	Varies by protective height
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.)]	30 mm (1.18 in.)
Scanning Range	**0...18 m (0...59 ft)**
Synchronization	Optical, first beam adjacent to LEDs
Wavelength	950 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
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

Standard System Safety Light Curtain

The Allen-Bradley Guardmaster GuardShield Safe 2 safety light curtains are offered in 30 mm resolution, are ordered as pairs—transmitter and receiver—and are shipped under one cat. no. Each GuardShield Safe 2 pair are shipped with 180˚ mounting brackets. After selecting the appropriate light curtain pair, ensure that the appropriate cables, interfaces, and accessories are ordered.

Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Pair Weight [kg (lbs)]	Cat. No.
120 (4.7)	30 (1.18)	8	1.0 (2.2)	445L-P2S0120YD
240 (9.4)	30 (1.18)	16	1.4 (3.09)	445L-P2S0240YD
360 (14.2)	30 (1.18)	24	1.8 (3.97)	445L-P2S0360YD
480 (19.9)	30 (1.18)	32	2.2 (4.85)	445L-P2S0480YD
600 (23.6)	30 (1.18)	40	2.6 (5.73)	445L-P2S0600YD
720 (28.3)	30 (1.18)	48	3.0 (6.61)	445L-P2S0720YD
840 (33.1)	30 (1.18)	56	3.5 (7.72)	445L-P2S0840YD
960 (37.8)	30 (1.18)	64	4.0 (8.82)	445L-P2S0960YD
1080 (42.5)	30 (1.18)	72	4.0 (8.82)	445L-P2S1080YD
1200 (47.2)	30 (1.18)	80	4.5 (9.92)	445L-P2S1200YD
1320 (52.0)	30 (1.18)	88	5.0 (11.02)	445L-P2S1320YD
1440 (56.7)	30 (1.18)	86	5.5 (12.13)	445L-P2S1440YD
1560 (61.4)	30 (1.18)	94	6.0 (13.23)	445L-P2S1560YD
1680 (66.1)	30 (1.18)	102	6.5 (14.33)	445L-P2S1680YD
1800 (70.9)	30 (1.18)	110	7.0 (15.43)	445L-P2S1800YD
1920 (75.6)	30 (1.18)	118	7.5 (16.53)	445L-P2S1920YD

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.

Recommended Logic Interfaces

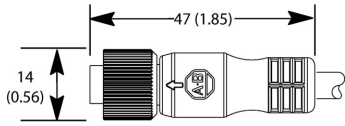| Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays for 2 N.C. Contact Switch							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	MSR127RP/TP	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	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							
MSR210P Base 2 N.C. only	2 N.O.	1 N.C. and 2 PNP Solid State	Removable	Auto./Manual or Monitored Manual	24V DC from the base unit	MSR210P	440R-H23176
MSR220 Input Module	—	—	Removable	—	24V DC	MSR220P	440R-H23178
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

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
				30 (98.4)		889D-F5AC-30
	Shielded Straight Female Shielded	1 Brown 2 White 3 Blue 4 Black 5 Grey	22 AWG 22 AWG 300V 4 A	2 (6.56)		889D-F5EC-2
				5 (16.4)		889D-F5EC-5
				10 (32.8)		889D-F5EC-10
				15 (49.2)		889D-F5EC-15
				20 (65.6)		889D-F5EC-20
				30 (98.4)		889D-F5EC-30

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 for MSR41 or MSR42 (requires ribbon cable connection)	440R-P4NANS
	USB optical interface software configuration tool used to configure the MSR42	445L-AF6150
	Ribbon cable—for one MSR45E	440R-ACABL1
	Ribbon cable—for two MSR45Es	440R-ACABL2
	Ribbon cable—for three MSR45Es	440R-ACABL3
	Mounting stand	440L-AMSTD

Note: MSR42 operating software may be downloaded at *www.ab.com/safety*.

Corner Mirror for Multi-Sided Guarding

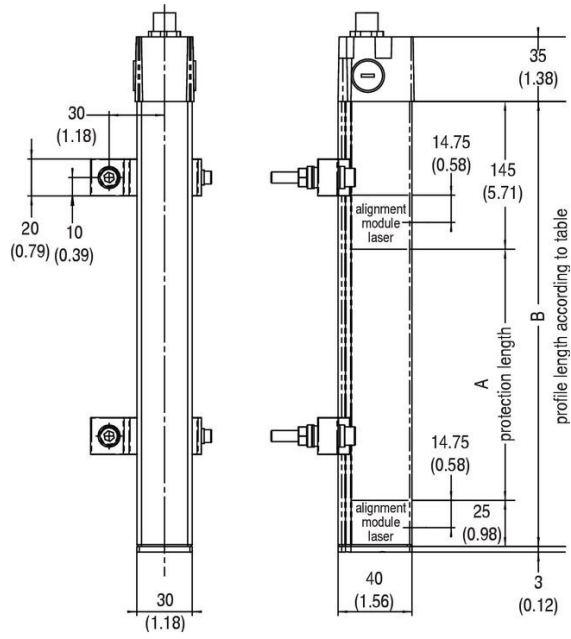Specially constructed glass mirrors for 2- and 3-sided safeguarding applications.

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.
120/140 (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

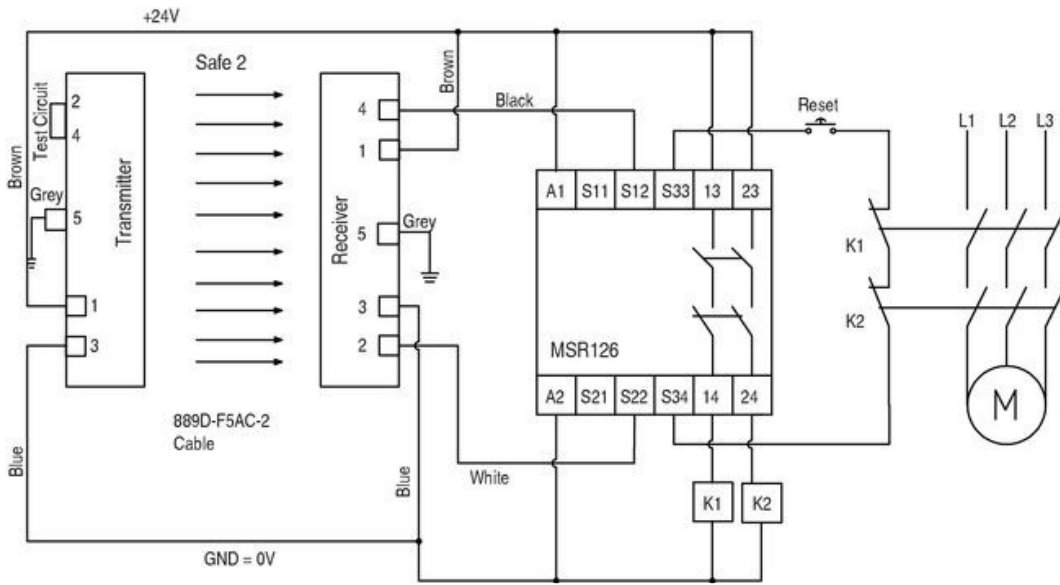Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes.

Safety Light Curtain

Type	A Protective Height [mm (in.)]	B Profile Length [mm (in.)]
445L-P2S0120YD	120 (4.7)	290 (11.4)
445L-P2S0240YD	240 (9.4)	410 (16.1)
445L-P2S0360YD	360 (14.2)	530 (20.9)
445L-P2S0480YD	480 (18.9)	650 (25.6)
445L-P2S0600YD	600 (23.6)	771 (30.4)
445L-P2S0720YD	720 (28.3)	891 (35.1)
445L-P2S0840YD	840 (33.1)	1011 (39.8)
445L-P2S0960YD	960 (37.8)	1131 (44.5)
445L-P2S1080YD	1080 (42.5)	1252 (49.3)
445L-P2S1200YD	1200 (47.2)	1372 (54.0)
445L-P2S1320YD	1320 (51.9)	1492 (58.7)
445L-P2S1440YD	1440 (56.7)	1612 (63.5)
445L-P2S1560YD	1560 (61.4)	1733 (68.2)
445L-P2S1680YD	1680 (66.1)	1853 (72.9)
445L-P2S1800YD	1800 (70.8)	1973 (77.7)
445L-P2S1920YD	1920 (75.6)	2093 (82.4)

Wiring Diagram for Connection to MSR126

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

Wiring Diagram for Connection to MSR127