

Features

Standard GuardShield

- Fixed blanking—teachable
- Floating blanking
 - One-beam floating blanking on 30 mm resolution
 - Two-beam floating blanking on 14 mm resolution
- Beam coding
- External Device Monitoring (EDM)
- Start/restart interlock
- M12 quick-disconnect connectors
- 160 to 1760 mm in 160 mm increments
- Standard GuardShield can be used as last segment pair in a cascading system

Standard GuardShield with Integrated Laser Alignment

- Fixed blanking—teachable
- Floating blanking
- Beam coding
- M12 quick-disconnect connectors
- Ease of alignment at installation with visible laser alignment
- 320...1600 mm in 160 mm increments
- 14 and 30 mm resolutions

Remote Teach GuardShield

- Three-position momentary key switch
- IP65 rated key switch box
- Y connector for quick-disconnect connections
- Standard GuardShield cables
- Allows quick and efficient reteaching of fixed blanked areas
- 160 to 1760 mm in 160 mm increments

Cascadable GuardShield System

- Easy to interconnect light curtains up to three 1760 mm segment pairs
- No increase in system response time

ArmorBlock Guard I/O GuardShield

- Fixed blanking—teachable
- Floating blanking
- Up to three cascading pairs can connect to ArmorBlock Guard I/O
- Beam coding
- M12 quick-disconnect connectors
- DeviceNet safe network connectivity
- 320...1600 mm in 160 mm increments

Specifications

Safety Ratings

Standards	IEC/EN 61496 Parts 1 & 2, UL 61496 Parts 1 & 2, UL 1998
Safety Classification	Type 4 per IEC/EN61496. Category 4 device per EN 954-1, SIL 3 per IEC 61508, PL _e per EN/ISO 13849
Certifications	cULus, UL 61496, UL 1998, TÜV, and CE Marked for all applicable directives

Power Supply

Input Power, Max.	24V DC ±20%
Maximum Residual Ripple	0.05 Vss
Power Consumption	0.4 A max (no load)

Outputs

Safety Outputs	2 OSSD, 0.5 A, short-circuit protected
Non-Safety Outputs	Auxiliary output, 0.5 A max.
Output Voltage, Min.	(U _v) - 2V
Switching Current @ Voltage, Min.	500 mA @ 24V DC

Operating Characteristics

Response Time	14 mm; 160 mm...1440 mm 20 ms, 1600 mm and 1760 mm, 25 ms. 30 mm; 20 ms. Add 10 ms when beam coding activated.
Status Indicators	ON State, OFF State, Blanking, Alignment, Interlock
Protected Height [mm (in.)]	See Product Selection tables.
Resolution [mm (in.)]	14 (0.55) or 30 (1.18)
Scanning Range/Resolution	0.3...7 m / 14 mm (0.98...22.9 ft / 0.55 in.) 0.3...16 m / 30 mm (0.98...52 ft / 1.18 in.)
Synchronization	Optical, first beam adjacent to LEDs.
Wavelength	870 nm

Environmental

Enclosure Type Rating	IP65
Relative Humidity	15...95% (noncondensing)
Operating Temperature [C (F)]	-10...55° (14...131°)
Vibration	IEC60068-2-6: Frequency 10...55 Hz; Amplitude: 0.35 mm (0.01 in.)
Shock	IEC60068-2-29: Acceleration 10 g, pulse duration 16 ms 10...55 Hz

Physical Characteristics

Mounting	End-cap brackets supplied
Weight	Varies by protective height
Housing Cross Section	40 mm x 50 mm (1.57 in. x 1.96 in.)
Connection Type	Transmitter: 4-pin M12 micro QD; Receiver: 8-pin M12 micro QD
Cable Length	30 m (100 ft) max.

Presence Sensing Safety Devices

POC Type 4 Safety Light Curtains

GuardShield

Product Selection

Standard System

The Allen-Bradley Guardmaster GuardShield safety light curtains are ordered as pairs—transmitter and receiver—and shipped under one cat. no. After selecting the appropriate light curtain pair, ensure that required interfaces and accessories are ordered.

Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.	Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.
160 (6.3)	14 (0.55)	16	440L-P4J0160YD	160 (6.3)	30 (1.18)	8	440L-P4K0160YD
320 (12.6)	14 (0.55)	32	440L-P4J0320YD	320 (12.6)	30 (1.18)	16	440L-P4K0320YD
480 (18.9)	14 (0.55)	48	440L-P4J0480YD	480 (18.9)	30 (1.18)	24	440L-P4K0480YD
640 (25.2)	14 (0.55)	64	440L-P4J0640YD	640 (25.2)	30 (1.18)	32	440L-P4K0640YD
800 (31.5)	14 (0.55)	80	440L-P4J0800YD	800 (31.5)	30 (1.18)	40	440L-P4K0800YD
960 (37.8)	14 (0.55)	96	440L-P4J0960YD	960 (37.8)	30 (1.18)	48	440L-P4K0960YD
1120 (44.1)	14 (0.55)	112	440L-P4J1120YD	1120 (44.1)	30 (1.18)	56	440L-P4K1120YD
1280 (50.4)	14 (0.55)	128	440L-P4J1280YD	1280 (50.4)	30 (1.18)	64	440L-P4K1280YD
1440 (56.7)	14 (0.55)	144	440L-P4J1440YD	1440 (56.7)	30 (1.18)	72	440L-P4K1440YD
1600 (63.0)	14 (0.55)	160	440L-P4J1600YD	1600 (63.0)	30 (1.18)	80	440L-P4K1600YD
1760 (69.1)	14 (0.55)	176	440L-P4J1760YD	1760 (69.1)	30 (1.18)	88	440L-P4K1760YD

Note: The GuardShield transmitter requires a 4-pin cable and the receiver requires an 8-pin cable.

Note: To select just a transmitter or receiver, replace the "P" in the above cat. nos. with a "T" for transmitter and an "R" for receiver.

Remote Teach System

The Allen-Bradley Guardmaster GuardShield remote teach system is ordered as a system. The system consists of a standard GuardShield transmitter in either 14 mm or 30 mm resolutions with mounting hardware, a GuardShield receiver with a 10 inch Y-connector cable, a metal key switch box, and a 4-pin 2 meter patchcord which connects between the key switch box and the Y-connector.

Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.	Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.
160 (6.3)	14 (0.55)	16	440L-S4J0160YR	160 (6.3)	30 (1.18)	8	440L-S4K0160YR
320 (12.6)	14 (0.55)	32	440L-S4J0320YR	320 (12.6)	30 (1.18)	16	440L-S4K0320YR
480 (18.9)	14 (0.55)	48	440L-S4J0480YR	480 (18.9)	30 (1.18)	24	440L-S4K0480YR
640 (25.2)	14 (0.55)	64	440L-S4J0640YR	640 (25.2)	30 (1.18)	32	440L-S4K0640YR
800 (31.5)	14 (0.55)	80	440L-S4J0800YR	800 (31.5)	30 (1.18)	40	440L-S4K0800YR
960 (37.8)	14 (0.55)	96	440L-S4J0960YR	960 (37.8)	30 (1.18)	48	440L-S4K0960YR
1120 (44.1)	14 (0.55)	112	440L-S4J1120YR	1120 (44.1)	30 (1.18)	56	440L-S4K1120YR
1280 (50.4)	14 (0.55)	128	440L-S4J1280YR	1280 (50.4)	30 (1.18)	64	440L-S4K1280YR
1440 (56.7)	14 (0.55)	144	440L-S4J1440YR	1440 (56.7)	30 (1.18)	72	440L-S4K1440YR
1600 (63.0)	14 (0.55)	160	440L-S4J1600YR	1600 (63.0)	30 (1.18)	80	440L-S4K1600YR
1760 (69.1)	14 (0.55)	176	440L-S4J1760YR	1760 (69.1)	30 (1.18)	88	440L-S4K1760YR
Remote Teach Keyswitch Box Assembly*			440L-M8600	DC Micro Style Quick-Disconnect Patchcord, 4-Pin*			889D-F4ACDM-2

Note: The GuardShield transmitter requires a 4-pin cable and the receiver requires an 8-pin cable.

Note: The GuardShield remote teach system light curtains can be ordered as pairs by replacing the "S" in the cat. no. a with "P."

* Included with each system cat. no.; can be ordered as a replacement part.

Cascadable Standard System

Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.	Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.
320 (12.6)	14 (0.55)	32	440L-C4J0320YD	320 (12.6)	30 (1.18)	16	440L-C4K0320YD
480 (18.9)	14 (0.55)	48	440L-C4J0480YD	480 (18.9)	30 (1.18)	24	440L-C4K0480YD
640 (25.2)	14 (0.55)	64	440L-C4J0640YD	640 (25.2)	30 (1.18)	32	440L-C4K0640YD
800 (31.5)	14 (0.55)	80	440L-C4J0800YD	800 (31.5)	30 (1.18)	40	440L-C4K0800YD
960 (37.8)	14 (0.55)	96	440L-C4J0960YD	960 (37.8)	30 (1.18)	48	440L-C4K0960YD
1120 (44.1)	14 (0.55)	112	440L-C4J1120YD	1120 (44.1)	30 (1.18)	56	440L-C4K1120YD
1280 (50.4)	14 (0.55)	128	440L-C4J1280YD	1280 (50.4)	30 (1.18)	64	440L-C4K1280YD
1440 (56.7)	14 (0.55)	144	440L-C4J1440YD	1440 (56.7)	30 (1.18)	72	440L-C4K1440YD
1660 (63.0)	14 (0.55)	160	440L-C4J1600YD	1600 (63.0)	30 (1.18)	80	440L-C4K1600YD
1760 (69.3)	14 (0.55)	176	440L-C4J1760YD	1760 (69.3)	30 (1.18)	88	440L-C4K1760YD

Note: Cascadable systems are sold in pairs represented by the "C" in the cat. no. To order the cascadable transmitter or receiver, replace the "C" with a "G" for the transmitter or "F" for the receiver.

GuardShield with Integrated Laser Alignment

Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.	Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.
320 (12.6)	14 (0.55)	32	440L-P4JL0320YD	320 (12.6)	30 (1.18)	16	440L-P4KL0320YD
480 (18.9)	14 (0.55)	48	440L-P4JL0480YD	480 (18.9)	30 (1.18)	24	440L-P4KL0480YD
640 (25.2)	14 (0.55)	64	440L-P4JL0640YD	640 (25.2)	30 (1.18)	32	440L-P4KL0640YD
800 (31.5)	14 (0.55)	80	440L-P4JL0800YD	800 (31.5)	30 (1.18)	40	440L-P4KL0800YD
960 (37.8)	14 (0.55)	96	440L-P4JL0960YD	960 (37.8)	30 (1.18)	48	440L-P4KL0960YD
1120 (44.1)	14 (0.55)	112	440L-P4JL1120YD	1120 (44.1)	30 (1.18)	56	440L-P4KL1120YD
1280 (50.4)	14 (0.55)	128	440L-P4JL1280YD	1280 (50.4)	30 (1.18)	64	440L-P4KL1280YD
1440 (56.7)	14 (0.55)	144	440L-P4JL1440YD	1440 (56.7)	30 (1.18)	72	440L-P4KL1440YD
1600 (63.0)	14 (0.55)	160	440L-P4JL1600YD	1600 (63.0)	30 (1.18)	80	440L-P4KL1600YD

Note: GuardShields are sold in pairs. To select a transmitter or receiver, replace the "P" in the cat. no. with a "T" for transmitter and an "R" for receiver.

Cascadable GuardShield with Integrated Laser Alignment

Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.	Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.
320 (12.6)	14 (0.55)	32	440L-C4JL0320YD	320 (12.6)	30 (1.18)	16	440L-C4KL0320YD
480 (18.9)	14 (0.55)	48	440L-C4JL0480YD	480 (18.9)	30 (1.18)	24	440L-C4KL0480YD
640 (25.2)	14 (0.55)	64	440L-C4JL0640YD	640 (25.2)	30 (1.18)	32	440L-C4KL0640YD
800 (31.5)	14 (0.55)	80	440L-C4JL0800YD	800 (31.5)	30 (1.18)	40	440L-C4KL0800YD
960 (37.8)	14 (0.55)	96	440L-C4JL0960YD	960 (37.8)	30 (1.18)	48	440L-C4KL0960YD
1120 (44.1)	14 (0.55)	112	440L-C4JL1120YD	1120 (44.1)	30 (1.18)	56	440L-C4KL1120YD
1280 (50.4)	14 (0.55)	128	440L-C4JL1280YD	1280 (50.4)	30 (1.18)	64	440L-C4KL1280YD
1440 (56.7)	14 (0.55)	144	440L-C4JL1440YD	1440 (56.7)	30 (1.18)	72	440L-C4KL1440YD
1600 (63.0)	14 (0.55)	160	440L-C4JL1600YD	1600 (63.0)	30 (1.18)	80	440L-C4KL1600YD

Note: Cascadable GuardShields are sold in pairs. To select a transmitter or receiver, replace the "C" with a "G" for cascadable transmitter and an "F" for a cascadable receiver.

Presence Sensing Safety Devices

POC Type 4 Safety Light Curtains

GuardShield

GuardShield with Integrated Laser Alignment and ArmorBlock Guard I/O Connectivity

Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.	Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.
320 (12.6)	14 (0.55)	32	440L-P4JL0320YA	320 (12.6)	30 (1.18)	16	440L-P4KL0320YA
480 (18.9)	14 (0.55)	48	440L-P4JL0480YA	480 (18.9)	30 (1.18)	24	440L-P4KL0480YA
640 (25.2)	14 (0.55)	64	440L-P4JL0640YA	640 (25.2)	30 (1.18)	32	440L-P4KL0640YA
800 (31.5)	14 (0.55)	80	440L-P4JL0800YA	800 (31.5)	30 (1.18)	40	440L-P4KL0800YA
960 (37.8)	14 (0.55)	96	440L-P4JL0960YA	960 (37.8)	30 (1.18)	48	440L-P4KL0960YA
1120 (44.1)	14 (0.55)	112	440L-P4JL1120YA	1120 (44.1)	30 (1.18)	56	440L-P4KL1120YA
1280 (50.4)	14 (0.55)	128	440L-P4JL1280YA	1280 (50.4)	30 (1.18)	64	440L-P4KL1280YA
1440 (56.7)	14 (0.55)	144	440L-P4JL1440YA	1440 (56.7)	30 (1.18)	72	440L-P4KL1440YA
1600 (63.0)	14 (0.55)	160	440L-P4JL1600YA	1600 (63.0)	30 (1.18)	80	440L-P4KL1600YA

Note: GuardShields are sold in pairs. To select a transmitter or receiver, replace the "P" in the cat. no. with an "R" for a receiver. The GuardShield standard transmitter is used in the pair. To order a transmitter, replace the "P" with a "T" and the "A" with a "D."

Cascadable GuardShield with Integrated Laser Alignment and ArmorBlock Guard I/O Connectivity


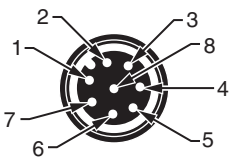
Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.	Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.
320 (12.6)	14 (0.55)	32	440L-C4JL0320YA	320 (12.6)	30 (1.18)	16	440L-C4KL0320YA
480 (18.9)	14 (0.55)	48	440L-C4JL0480YA	480 (18.9)	30 (1.18)	24	440L-C4KL0480YA
640 (25.2)	14 (0.55)	64	440L-C4JL0640YA	640 (25.2)	30 (1.18)	32	440L-C4KL0640YA
800 (31.5)	14 (0.55)	80	440L-C4JL0800YA	800 (31.5)	30 (1.18)	40	440L-C4KL0800YA
960 (37.8)	14 (0.55)	96	440L-C4JL0960YA	960 (37.8)	30 (1.18)	48	440L-C4KL0960YA
1120 (44.1)	14 (0.55)	112	440L-C4JL1120YA	1120 (44.1)	30 (1.18)	56	440L-C4KL1120YA
1280 (50.4)	14 (0.55)	128	440L-C4JL1280YA	1280 (50.4)	30 (1.18)	64	440L-C4KL1280YA
1440 (56.7)	14 (0.55)	144	440L-C4JL1440YA	1440 (56.7)	30 (1.18)	72	440L-C4KL1440YA
1600 (63.0)	14 (0.55)	160	440L-C4JL1600YA	1600 (63.0)	30 (1.18)	80	440L-C4KL1600YA

Note: Cascadable GuardShields are sold in pairs. To select a transmitter or receiver replace the "C" with an "F" for a cascadable receiver. The cascadable GuardShield standard transmitter is used in these pairs. To order a cascadable transmitter, replace the "C" with a "G" and the "A" with a "D" to specify the appropriate transmitter cat. no.

Recommended Logic Interfaces

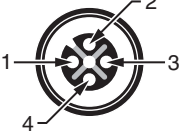
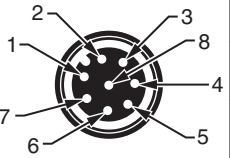
Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays for 2 N.C. Contact Switch							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	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	5-82	440R-H23176
MSR211	2 N.O.	1 N.C.	Removable	Auto./Manual or Monitored Manual	24V DC from the base unit	5-84	440R-H23177
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218
Muting Modules							
MSR22LM	2 N.O.	1 N.C.	Removable	Auto./Manual	24V DC	5-48	440R-P23071
MSR42 (requires optical interface to configure 445L-AF6150)	2 PNP	2 PNP, configurable	Removable	Auto./manual or manual monitored	24V DC	5-52	440R-P226AGS-NNR


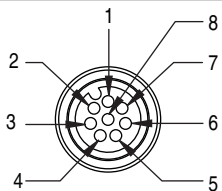
Standard and Remote Teach Cordsets—Two Required (one for transmitter and one for receiver)

Female Connector (Sensor End)		Cable			Cat. No.
Face View of Female	Connector Style	Pin/Wire Color	Wire Rating	Length [m (ft)]	
Transmitter					
	Straight Female	1 Brown 2 White 3 Blue 4 Black	22 AWG 300V 4 A	2 (6.56)	889D-F4AC-2
				5 (16.4)	889D-F4AC-5
				10 (32.8)	889D-F4AC-10
				15 (49.2)	889D-F4AC-15
				20 (65.6)	889D-F4AC-20
				30 (98.4)	889D-F4AC-30
Receiver					
	Straight Female	1 White 2 Brown 3 Green 4 Yellow 5 Grey 6 Pink 7 Blue 8 Red	24 AWG 30V AC/36V DC 1.5 A	2 (6.56)	889D-F8AB-2
				5 (16.4)	889D-F8AB-5
				10 (32.8)	889D-F8AB-10
				15 (49.2)	889D-F8AB-15
				20 (65.6)	889D-F8AB-20
				30 (98.4)	889D-F8AB-30

Cascadable System Patchcords—to connect cascadable GuardShield system

The GuardShield transmitter host patchcord has 4-pin DC micro over-molded quick-disconnect connectors offered in lengths of 1/3 m, 1 m, and 2 m. The GuardShield receiver host patchcord has 8-pin DC micro over-molded quick-disconnect connectors offered in lengths of 1/3 m, 1 m, and 2 m.

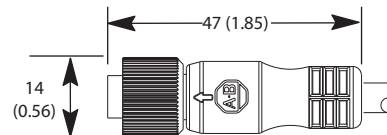
Face View of Female	Description	Cat. No.
Transmitter Patchcord		
	4-pin M12 patchcord, 0.3 m (12 in.)	889D-F4ACDM-0M3
	4-pin M12 patchcord, 1 m (39.37 in.)	889D-F4ACDM-1
	4-pin M12 patchcord, 2 m (78.74 in.)	889D-F4ACDM-2
Receiver Patchcord		
	8-pin M12 patchcord, 0.3 m (12 in.)	889D-F8ABDM-0M3
	8-pin M12 patchcord, 1 m (39.37 in.)	889D-F8ABDM-1
	8-pin M12 patchcord, 2 m (78.74 in.)	889D-F8ABDM-2

Face View of Female	Description	Cat. No.
Receiver Termination Plug		
	Termination plug 8-pin M12 quick disconnect Required for connection to top connector of cascadable receiver if cascade light curtain is used as a standalone system or as the last segment pair in a cascaded system.	898D-81CU-DM
		

Note: A termination plug is not necessary for the cascadable transmitter.

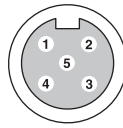
Cordsets Approximate Dimensions [mm (in.)]

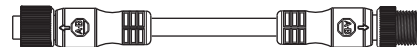
Dimensions are not intended to be used for installation purposes.



Straight Female M12 Quick Disconnect

ArmorBlock Guard I/O

Top View	Color	No. of Pins	Signal
			Receiver
	Brown	1	+24V
	White	2	OSSD 2
	Blue	3	0V
	Black	4	OSSD 1
	Grey	5	NC



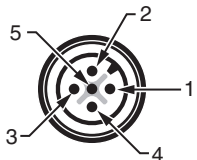
Interconnecting Patchcords—ArmorBlock I/O Connection

Cat. No.	Description
889D-F5ACDM-0M3	Five-pin M12 patchcord, 0.3 m (12 in.)
889D-F5ACDM-1	Five-pin M12 patchcord, 1 m (39.37 in.)
889D-F5ACDM-2	Five-pin M12 patchcord, 2 m (78.74 in.)
889D-F5ACDM-5	Five-pin M12 patchcord, 5 m (196.85 in.)
889D-F5ACDM-10	Five-pin M12 patchcord, 10 m (393.7 in.)

Note: The GuardShield pairs with ArmorBlock Guard I/O Connectivity have a 5-pin M12 quick-disconnect connector on the receiver wired to allow connection to the ArmorBlock 5-pin connector. The transmitter in that GuardShield pair is a standard GuardShield transmitter with integrated laser alignment system offered with a 4-pin M12 quick-disconnect connector. It is possible to connect either a standard 4-pin M12 cordset or the 5-pin M12 quick-disconnect connector cordset or patchcord to this transmitter.













Presence Sensing Safety Devices
POC Type 4 Safety Light Curtains
GuardShield

Termination Connector for Cascadable GuardShield Receiver (if it's a standalone pair) with ArmorBlock Guard I/O Connectivity

Face View of Female	Description	Cat. No.
	5-pin M12 Termination Adaptor	898D-418U-DM

Note: The cascadable GuardShield with ArmorBlock Guard I/O connectivity can be used as a standalone pair if the top connector on the receiver has a termination adaptor connected. The cascadable transmitter does not require a termination adaptor.



Optional Accessories

Description		Cat. No.
	Steel L-shaped end cap mounting bracket (4 per package) Note: 4 brackets supplied with each GuardShield pair.	440L-AF6101
	Aluminum middle mounting bracket for vibratory applications	440L-AF6108
	Power supply: Output—24V DC, 3 Amps, 72 W	1606-XLP72E
	Laser alignment tool	440L-ALAT
	GuardShield laser alignment tool bracket	440L-AF6109
	Mounting stand	440L-AMSTD
	Vertical shock mount kit	440L-AF6120
	Horizontal shock mount kit	440L-AF6121
	Middle vertical mount kit	440L-AF6122
	Middle horizontal mount kit	440L-AF6123
	GuardShield weld shield (cat. no. is for a pair of light curtains)	440L-AGWS0160
		440L-AGWS0320
		440L-AGWS0480
		440L-AGWS0640
		440L-AGWS0800
		440L-AGWS0960
		440L-AGWS1120
		440L-AGWS1280
		440L-AGWS1440
		440L-AGWS1600
	GuardShield Washdown Enclosure Kit Note: Only for use with standard GuardShield light curtain.	440L-AGST320
		440L-AGST480
		440L-AGST640
		440L-AGST800
		440L-AGST960
	8-pin M12 Receiver Termination Plug (Required for top receiver connector if a cascaded pair is used as a standalone or if it is the last pair in a cascaded system.)	898D-81CU-DM

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 up to 15% per mirror. Each corner mirror supplied with two endcap mounting brackets.

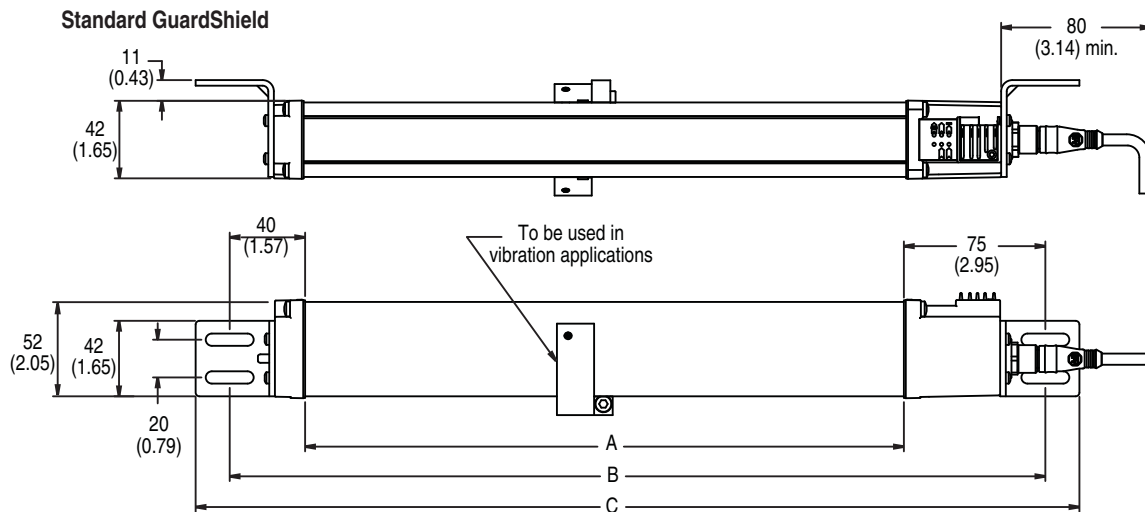
GuardShield Light Curtain Cat. No.	Narrow Mirror Short-Range 0...4 m	Cat. No.	Wide Mirror Long-Range 4...15 m	Cat. No.
440L-P4*0160Y* 440L-P2K‡0160YD		440L-AM0750300		440L-AM1250300
440L-P4*0320Y* 440L-P2K‡0320YD		440L-AM0750450		440L-AM1250450
440L-P4*0480Y* 440L-P2K‡0480YD 440L-P4A2500YD		440L-AM0750600		440L-AM1250600
440L-P4*0640Y* 440L-P2K‡0640YD		440L-AM0750750		440L-AM1250750
440L-P4*0800Y* 440L-P2K‡0800YD		440L-AM0750900		440L-AM1250900
440L-P4*0960Y* 440L-P2K‡0960YD 440L-P4A3400YD		440L-AM0751050		440L-AM1251050
440L-P4*1120Y* 440L-P2K‡1120YD		440L-AM0751200		440L-AM1251200
440L-P4*1280Y* 440L-P2K‡1280YD		440L-AM0751350		440L-AM1251350
440L-P4*1440Y* 440L-P2K‡1440YD		440L-AM0751500		440L-AM1251500
440L-P4*1600Y* 440L-P2K‡1600YD		440L-AM0751650		440L-AM1251650
440L-P4*1760Y* 440L-P2K‡1760YD		440L-AM0751800		440L-AM1251800

* = J or K;
* = D or R;
‡ = A or D

2-Opto-electronics

Approximate Dimensions

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



Presence Sensing Safety Devices

PAC Type 4 Safety Light Curtains

GuardShield PAC

Product Selection

PAC Safety Light Curtains—Standard

The Allen-Bradley Guardmaster GuardShield PAC safety light curtains are ordered as a pair—transmitter and receiver—and are shipped under one Cat. No. After selecting the appropriate Cat. No. ensure that the required interfaces and accessories are ordered as well.

Protected Height [mm (in.)]	Beam Spacing	Number of Beams	Cat. No.
520 (20.4)	500 mm (19.7 in.)	2	440L-P4A2500YD
820 (32.3)	400 mm (15.7 in.)	3	440L-P4A3400YD

Note: The GuardShield transmitter requires a 4-pin cable and the receiver requires an 8-pin cable.

Note: To select a transmitter or receiver substitute the "P" in the above cat. nos. with a "T" for a transmitter or an "R" for a receiver.

GuardShield PAC with Integrated Laser Alignment

Protected Height [mm (in.)]	Beam Spacing	Number of Beams	Cat. No.
520 (20.4)	500 mm (19.7 in.)	2	440L-P4AL2500YD
820 (32.3)	400 mm (15.7 in.)	3	440L-P4AL3400YD

Note: The GuardShield transmitter requires a 4-pin cable and the receiver requires an 8-pin cable.

Note: GuardShields are sold in pairs. To select a transmitter or receiver, replace the "P" in the cat. no. with a "T" for a transmitter or an "R" for a receiver.

GuardShield PAC with Integrated Laser Alignment and I/O Connectivity

Protected Height [mm (in.)]	Beam Spacing	Number of Beams	Cat. No.
520 (20.4)	500 mm (19.7 in.)	2	440L-P4AL2500YA
820 (32.3)	400 mm (15.7 in.)	3	440L-P4AL3400YA

Note: GuardShields are sold in pairs. To select a transmitter or receiver, replace the "P" in the cat. no. with an "R" for a receiver. PAC with integrated laser alignment and I/O connectivity uses a standard transmitter. To order a transmitter, replace the "P" with a "T" and the last "A" with a "D" (example: 440L-T2500YD).

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
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Single-Function Safety Relays for 2 N.C. Contact Switch

MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	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	5-82	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218









Muting Modules

MSR22LM	2 N.O.	1 N.C.	Removable	Auto./Manual	24V DC	5-48	440R-P23071
MSR42 (requires optical interface to configure 445L-AF6150	2 PNP	2 PNP, configurable	Removable	Auto./manual or manual monitored	24V DC	5-52	440R-P226AGS-NNR

Note: The use of a category 4 safety relay module does not improve the category rating of the safety system beyond the Category 2 rating of the Type 2 light curtain in use.

Presence Sensing Safety Devices
PAC Type 4 Safety Light Curtains
 GuardShield PAC

Accessories—Optional



Description		Cat. No.
	Steel L-shaped end cap mounting bracket (4 per package) Note: 4 brackets supplied with each GuardShield pair.	440L-AF6101 (1 package per system)
	Power Supply: Output 24V DC, 3 A, 72 W	1606-XLP72E
	Laser alignment tool	440L-ALAT
	GuardShield laser alignment tool bracket	440L-AF6109
	Mounting stand	440L-AMSTD
	GuardShield weld shield pair—3 beam	440L-AGWS0960
	GuardShield weld shield pair—2 beam	440L-AGWS0640
	Vertical shock mount kit	440L-AF6120
	GuardShield washdown enclosure kit—2 beam PAC	440L-AGST640
	GuardShield washdown enclosure kit—3 beam PAC	440L-AGST960

Note: The GuardShield washdown enclosure kits will not accommodate the GuardShield with Integrated Laser and with Integrated Laser and ArmorBlock Guard I/O connectivity.

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 10% per mirror.

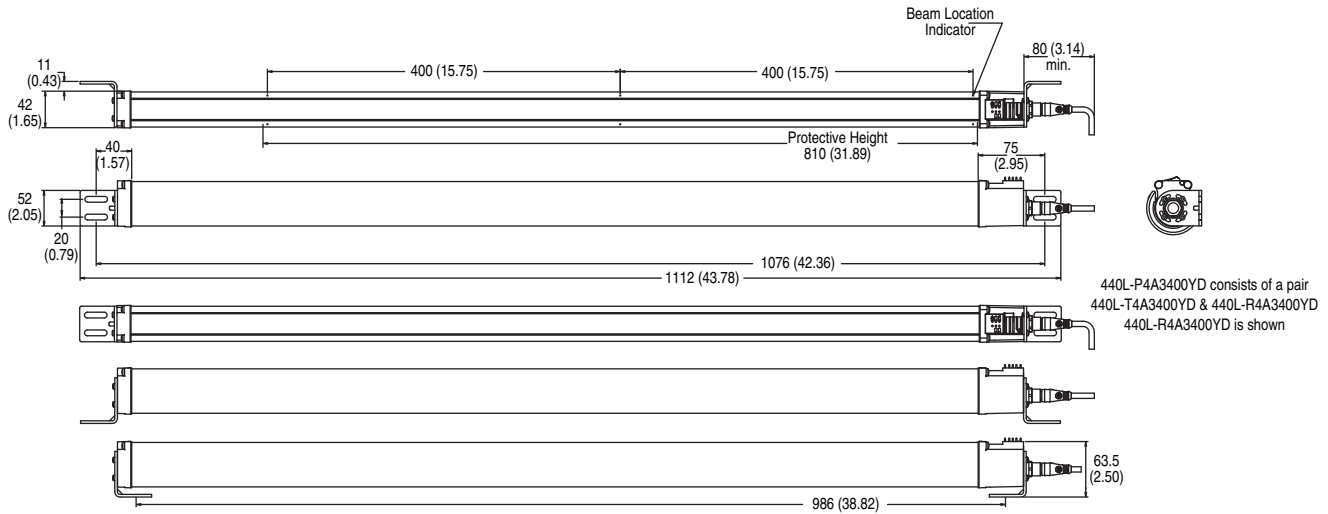
GuardShield Light Curtain Cat. No.	Narrow Mirror Short-Range 0...4 m	Cat. No.	Wide Mirror Long-Range 4...15 m	Cat. No.
440L-P4A2500YD		440L-AM0750750		440L-AM1250750
440L-P4A3400YD		440L-AM0751050		440L-AM1251050

Approximate Dimensions

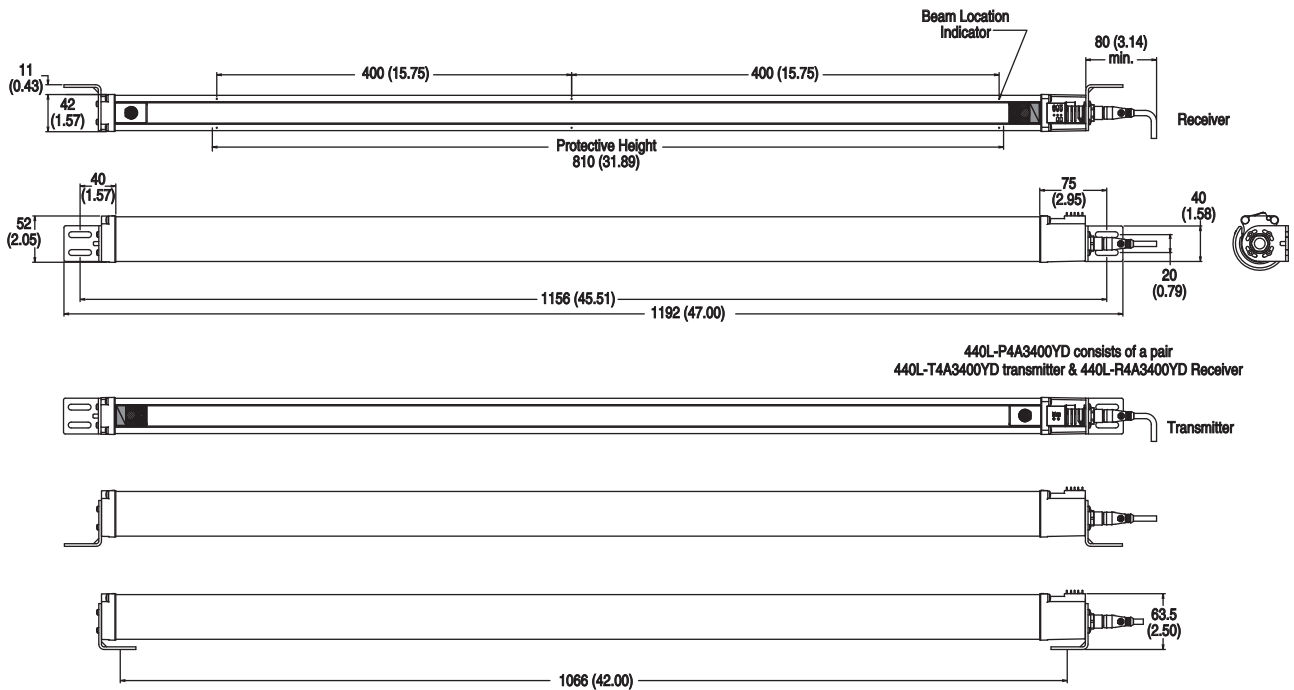
Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes.

Safety Light Curtain

440L-P4A3400YD

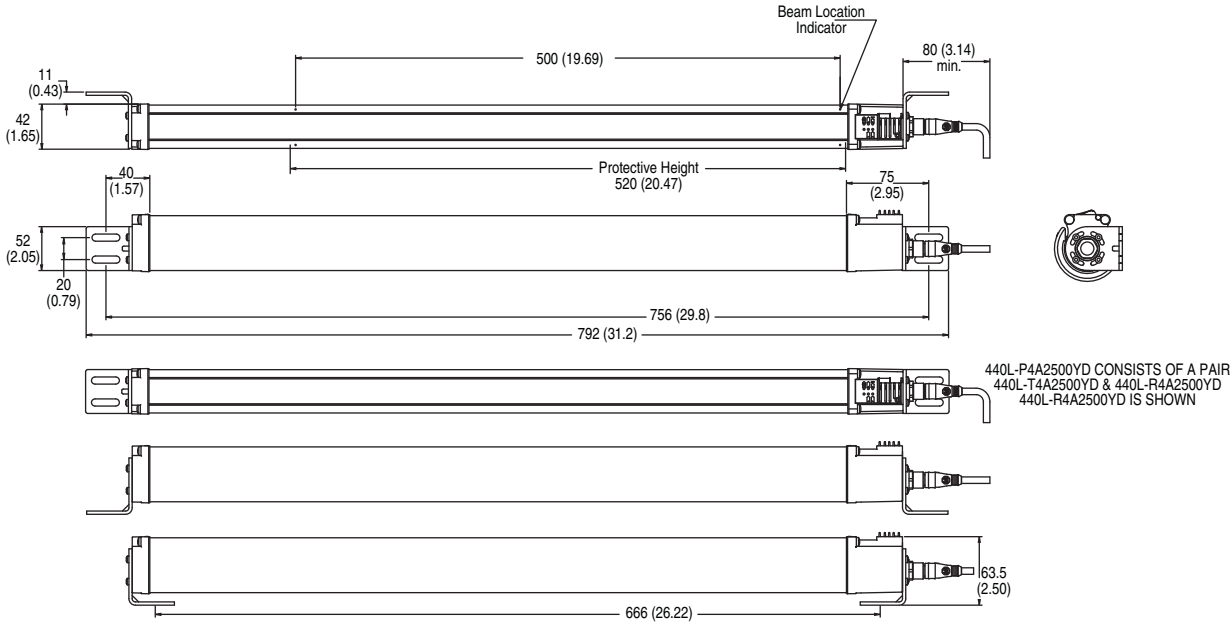


440L-P4AL3400YD

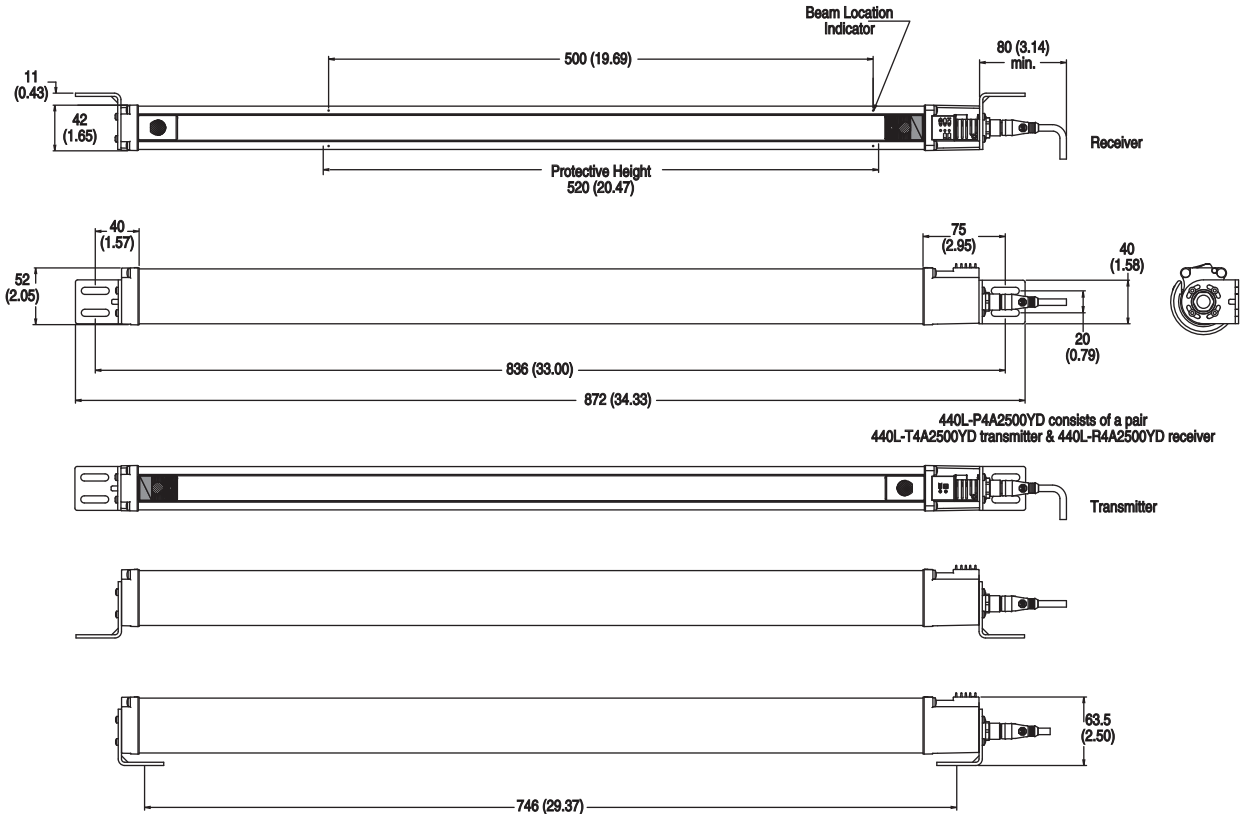


Presence Sensing Safety Devices
PAC Type 4 Safety Light Curtains
GuardShield PAC

440L-P4A2500YD



440L-P4AL2500YD



Cat. No.	A Protective Height [mm]	B Mounting Value [mm]	C Total Length [mm]
440L-P4A3400YD	820 ±0.5	1076	1112 ±1.5
440L-P4A2500YD	520 ±0.5	756	792 ±1.5
440L-P4AL3400Y*	820 ±0.5	—	—
440L-P4AL2500Y*	520 ±0.5	—	—

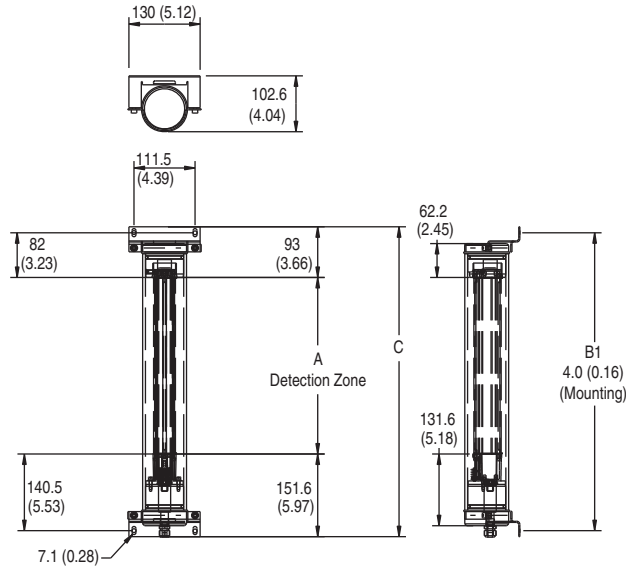
* Replace with "D" for standard 8-pin M12 or "A" for 5-pin M12 for ArmorBlock Guard I/O connectivity.

GuardShield Washdown Enclosures

The GuardShield washdown enclosure is designed to provide an environmentally protective enclosure for the GuardShield Type 4 and GuardShield PAC safety light curtains when they are applied in washdown applications. There is a range loss of approximately 10% when GuardShield light curtains are mounted inside of the IP67 washdown enclosures.

Approximate Dimensions

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



Cat. No.	Use with Light Curtain Cat. No.	A	B1	C
		Protective Height [mm (in.)]	Mounting Value [mm (in.)]	Total Length [mm (in.)]
440L-AGST320	440L-P4-0320YD	320 ±0.5 (12.6 ±0.02)	542.58 (21.36)	564.58 (22.23)
440L-AGST480	440L-P4-0480YD	480 ±0.5 (18.9 ±0.02)	702.58 (27.66)	724.58 (27.66)
440L-AGST640	440L-P4-0640YD	640 ±0.5 (25.2 ±0.02)	862.58 (33.96)	884.58 (34.83)
440L-AGST800	440L-P4-0800YD	800 ±0.5 (31.5 ±0.02)	1022.58 (40.26)	1044.58 (41.13)
440L-AGST960	440L-P4-0960YD	960 ±0.5 (37.8 ±0.02)	1182.58 (46.56)	1204.58 (47.42)

➤ Replace with J for 14 mm or K for 30 mm.

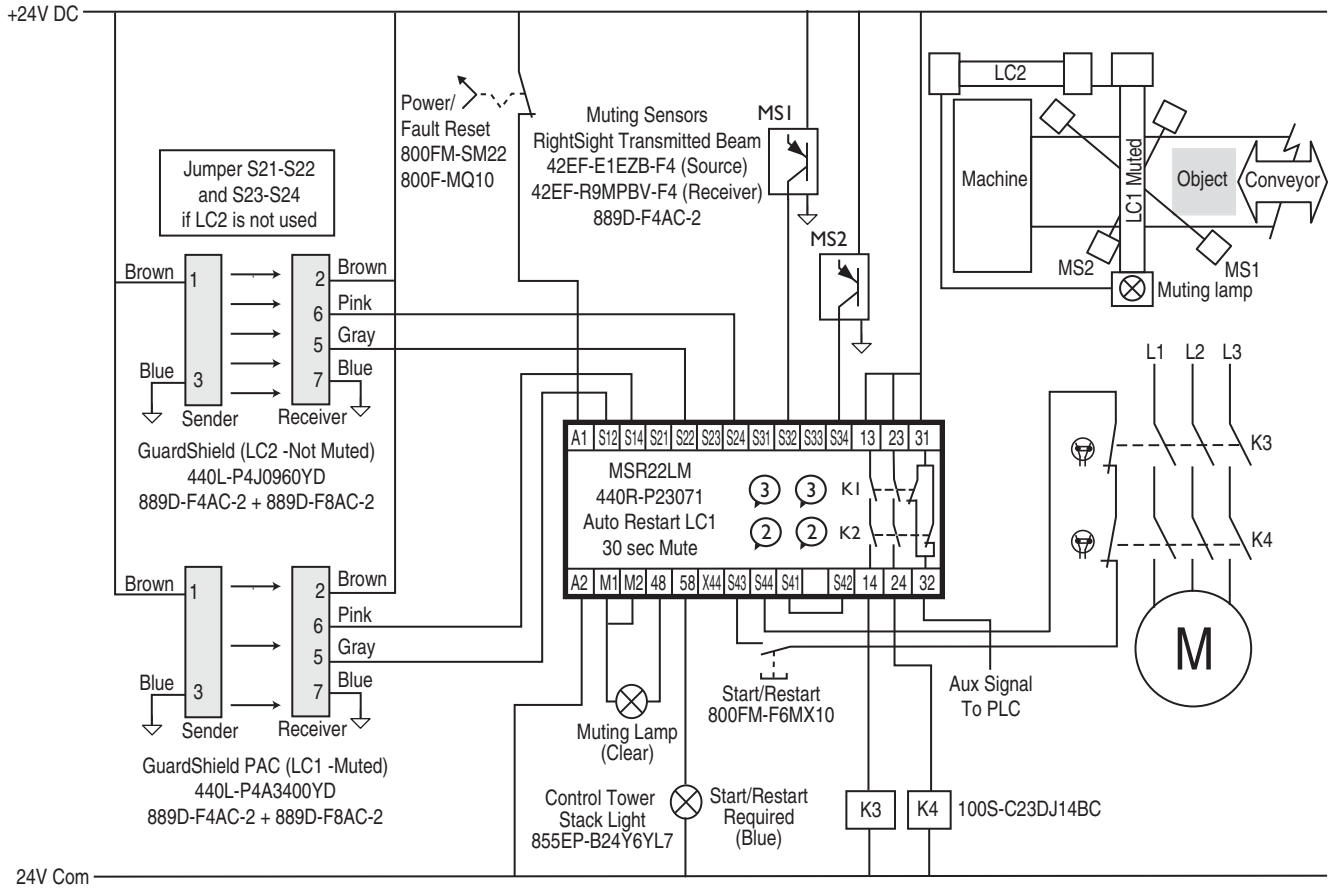
GuardShield PAC

Cat. No.	Use with Light Curtain Cat. No.	A	B1	C
		Protective Height [mm (in.)]	Mounting Value [mm (in.)]	Total Length [mm (in.)]
440L-AGST960	440L-P4A3400YD	810 ±0.5 (31.8 ±0.02)	1182.58 (46.56)	1204.58 (47.42)
440L-AGST640	440L-P4A2500YD	810 ±0.5 (31.8 ±0.02)	1182.58 (46.56)	884.58 (34.83)

Safety Applications and Wiring Diagrams

Light Curtain—Muting with Two Sensors

GuardShield, RightSight, 800F, Control Tower, MSR22LM, 100S



Circuit Status

The light curtain is clear. The muting sensors are clear. The outputs of the safety relay are de-energized, and the motor is off.

Operating Principle

The MSR22LM is designed for automated conveyor applications, where an object moves through a light curtain into or out of a hazardous area. With two sensor muting, the object can move in both directions.

STARTING: Upon initial power-up, the start/restart button must be pressed to energize the outputs of the MSR22LM and start the motor.

MUTING: The object must block the sensor MS1 and then MS2 prior to passing through the light curtain. After passing through the light curtain, the object must clear MS2 and then MS1 for the motor to continue running during the muting operation.

STOPPING: Obstructing the light curtain without blocking sensors MS1 and MS2 de-energizes the MSR22LM safety outputs. After clearing the light curtain, press the start/restart button to re-energize the safety outputs of the MSR22LM.

Fault Detection

Upon power-up, the GuardShield and MSR22LM perform internal checks. If OK and clear, the GuardShield outputs turn on. The MSR22LM checks the muting inputs. If OK, the MSR22LM checks the light curtain for dual channel signals. If OK, the muting lamp blinks continuously and the start/restart required lamp turns on to indicate that the MSR22LM is ready to start. While running, an incorrect sequence of the muting sensors and light curtain operation or excessive time to move the object through the light curtain will de-energize the safety outputs of the MSR22LM. The run LEDs or the muting lamp blink at certain rates to indicate the type of fault that has occurred. The start/restart button can be held down for three seconds to manually move material through the conveyor. The motor will then run for 12 seconds. Some faults can be cleared by removing the object from the sensors. The start/restart required indicator will turn on when the MSR22LM is ready to go. Other faults may have to be cleared by cycling the power to the MSR22LM. The MSR22LM monitors the 100S contactors through mechanically linked contacts connected in series. If one contactor welds closed, the second contactor will stop the motor, and the MSR22LM will detect the fault at the next attempt to start the motor.

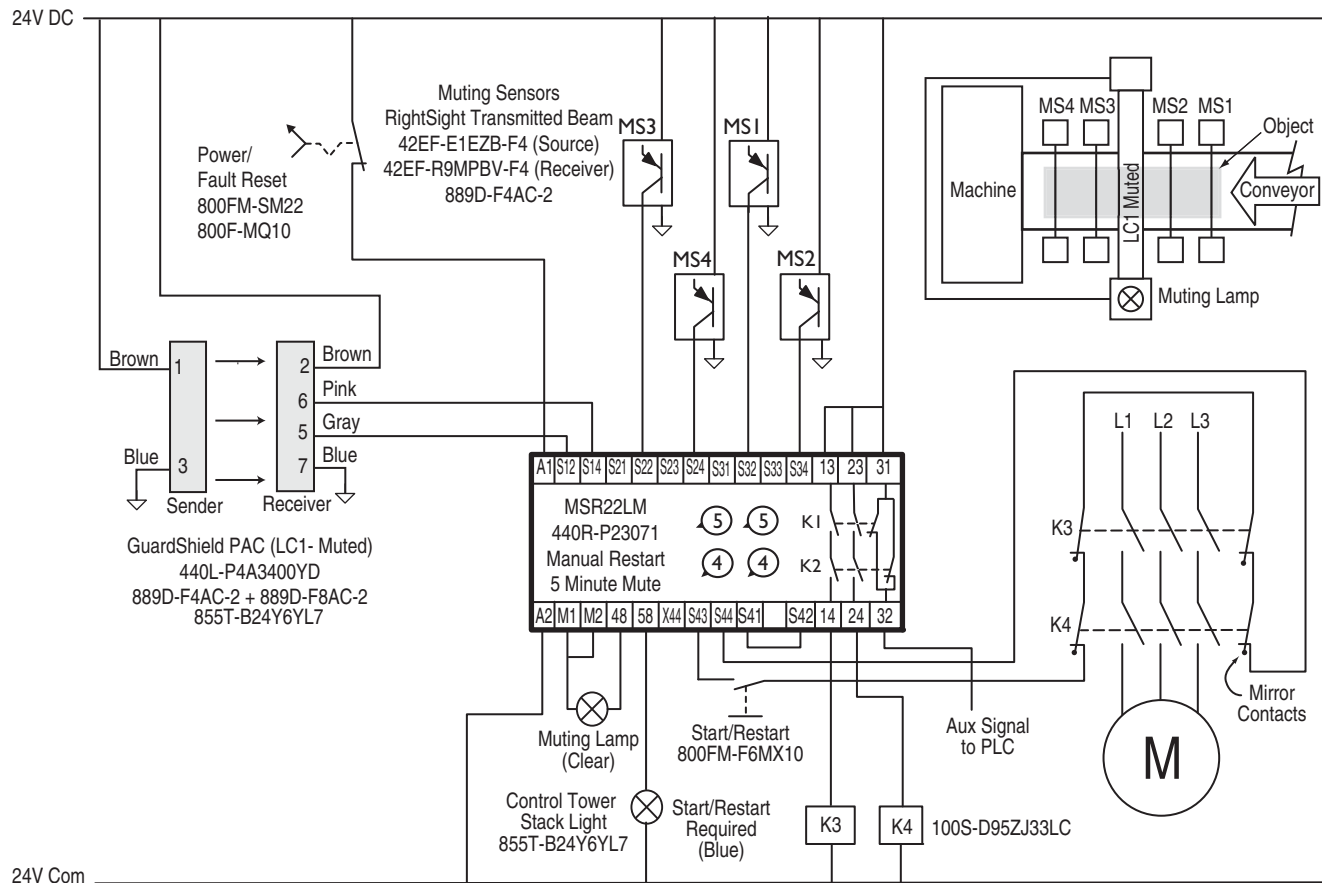
Ratings

The safety functions initiated by the two GuardShield light curtains meet the safety performance requirements of SIL CL 3 per IEC 62061:2005 and has Category 4 structure that can be used in systems requiring Performance Levels up to PLe per ISO 13849-1: 2006. This example circuit performs a Stop Category 0 function (coast to stop).

Safety Applications and Wiring Diagrams

Light Curtain—Muting with Four Sensors

GuardShield, RightSight, 800F, Control Tower, MSR22LM, 100S



Circuit Status

The light curtain is cleared. The muting sensors are cleared. The outputs of the safety relay are de-energized, and the motor is off.

Operating Principle

The MSR22LM is designed for automated conveyor applications, where an object moves through a light curtain into or out of a hazardous area. With four sensor muting, the object can only move in one direction.

STARTING: Upon initial power-up, the start/restart button must be pressed to energize the outputs of the MSR22LM and start the motor.

MUTING: The object must block the sensors MS1 and MS2 prior to passing through the light curtain. The object must be large enough to block all four sensors, for the motor to continue running during the muting operation.

STOPPING: Obstructing the light curtain without blocking sensors MS1 and MS2 de-energizes the MSR22LM safety outputs. After clearing the light curtain, press the start/restart button to re-energize the safety outputs of the MSR22LM.

Fault Detection

Upon power-up, the GuardShield and MSR22LM perform internal checks. If OK and clear, the GuardShield outputs turn on. The MSR22LM checks the muting inputs. If OK, the MSR22LM checks the light curtain for dual channel signals. If OK, the muting lamp blinks continuously and the start/restart required lamp turns on to indicate that the MSR22LM is ready to start. While running, an incorrect sequence of the muting sensors and light curtain operation or excessive time to move the object through the light curtain will de-energize the safety outputs of the MSR22LM. The run LEDs or the muting lamp blink at certain rates to indicate the type of fault that has occurred. The start/restart button can be held down for three seconds to manually move material through the conveyor. The motor will then run for 12 seconds. Some faults can be cleared by removing the object from the sensors. The start/restart required button will turn on when the MSR22LM is ready to go. Other faults may have to be cleared by cycling the power to the MSR22LM. The MSR22LM monitors the 100S-D contactors through the mechanically linked "mirrored" contacts connected in series. If one contactor welds closed, the second contactor will stop the motor, and the MSR22LM will detect the fault at the next attempt to start the motor.

Ratings

The safety function initiated by the GuardShield light curtain meets the safety performance requirements of SIL CL 3 per IEC 62061:2005 and has Category 4 structure that can be used in systems requiring Performance Levels up to PLe per ISO 13849-1: 2006. This example circuit performs a Stop Category 0 function (coast to stop).