



## Description

### Standard GuardShield

The Allen-Bradley Guardmaster GuardShield safety light curtain is an economical, fully featured, Type 4 safety light curtain in a uniquely styled housing. GuardShield safety light curtains are general-purpose presence sensing devices designed for use on hazardous machinery providing point of operation, as well as perimeter and access guarding. This self-contained, two-box, safety light curtain has DIP-switch selectable operating modes and is available in both 14 mm and 30 mm resolutions.

Modes of operation such as fixed and floating blanking, beam coding, start/restart interlock, external device monitoring (EDM), and machine test signal, are selected by DIP-switch settings. These DIP-switches are located beneath a security door, which are conveniently located on both the transmitter and receiver end caps.

The GuardShield's torsionally rigid, extruded aluminium, polyurethane powder-coated housing, combined with an environmental rating of IP65, allows the GuardShield to be used in guarding applications across a broad range of industries.



### Remote Teach GuardShield

The GuardShield Remote Teach system provides a remote means of changing a fixed blanking configuration within the GuardShield safety light curtain. This keyswitch box eliminates the need to open the GuardShield receiver door and perform the Teach function.

The three-position key switch simulates the opening of the GuardShield receiver door, teaching the GuardShield light curtain the new fixed blanking area, closing the door and returning to the run mode of operation.

The IP65 rated key switch box is provided with a steel mounting back plate to facilitate mounting of the box in proximity to the GuardShield receiver. It is necessary to see the receiver LEDs when performing the teach function.



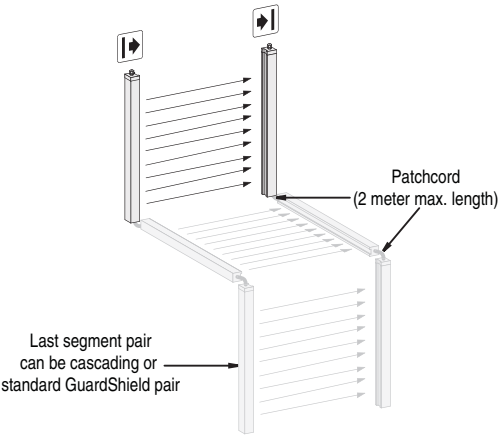
### Cascadable GuardShield System

A cascadable GuardShield safety light curtain is a standard GuardShield safety light curtain in 14 and 30 mm resolutions with additional M12 connectors located on top of each safety light curtain. The connector on the top of the safety light curtains allow the interconnection of up to a total of three pair of GuardShield safety light curtains with a common pair of OSSDs. The ability to interconnect GuardShield pairs reduces overall system wiring and simplifies the safety circuit resulting in a lower overall cost of a multiple safety light curtain system. This product configurability also allows a GuardShield safety light curtain system to protect multiple sides of a machine or simply adds flexibility when positioning GuardShield in various applications.

The complete cascading GuardShield system has the full functionality of a standard GuardShield (beam coding, EDM, start/restart interlock, fixed and floating blanking). There are a couple of operating modes which can not be configured in the middle and end segments (EDM and Start/Restart Interlock) and must only be configured in the host (first) pair. The system will still have these operating modes active if configured in the host or first GuardShield pair. This host or first pair is the pair of cascading GuardShield light curtains, which have the output cordsets connected and wired to the safety relay, safety PLC or FSDs. Configuring of the EDM operating mode in the end and middle segments will cause the system to go to a lock-out condition after the first interruption of the sensing field. Configuration of the start/restart interlock operating mode in the end and middle segments will cause the system to stay in a red condition awaiting reset after the interruption of the sensing field.

The cascading GuardShield safety light curtains are ordered as pairs (transmitter and receiver) and are shipped under one cat. no. After selecting the appropriate pair of cat. nos. for a cascading GuardShield system, select the interconnecting transmitter and receiver patchcord cat. nos. to connect the GuardShield pairs. The transmitter patchcord is a 4-pin M12 patchcord offered in lengths of 1/3 meter, 1 meter and 2 meters. The receiver patchcord is an 8-pin M12 patchcord offered in lengths of 1/3 meter, 1 meter, and 2 meters.

If the end pair of a cascading system is a cascading pair of GuardShield light curtains, it is necessary to attach a termination adaptor to the top M12 connector located on the receiver. Be sure to order all other required interfaces and accessories.



Up to three GuardShield POC segments can be interconnected.

The upper and lower limit of the protective field is shown by markings on the housings.

The width of the protective field is derived from the length of the light path between transmitter and receiver and must not exceed the maximum rated width of the protective field: 7 m for 14 mm (22.9 ft for 0.55 in.), 18 m for 30 mm (59.0 ft for 1.18 in.).

Cascading segments are offered in protective heights from 320...1760 mm in both 14 mm and 30 mm resolutions. Cascading segments of 160 mm are not offered, however; a 160 mm GuardShield can be used as the last segment in a cascading system.

A maximum of three GuardShield light curtains can be interconnected with a common pair of OSSDs. The maximum number of beams allowed in a cascading system is 528 beams, which equates to three 1760 mm cascading GuardShields in 14 mm resolution. The individual segments can have mixed resolutions, e.g., 14 mm and 30 mm as long as the pairs have the same protective heights and resolutions.

The response time of a cascading GuardShield system is the longest response time of any pair in the cascading system. For example, if the response time of each pair in the cascading system is 20 ms, then the cascading system's response time is 20 ms.

Cascading segments can be used as standalone light curtain pairs or can have up to three segments interconnected. These cascading segments all function as independent light curtains.

**IMPORTANT**

When cascading segments are used as standalone pairs or as the last segment in a cascading system, it is necessary to use a termination plug on the top connector of the GuardShield cascading receiver. It is also possible to use a standard GuardShield Type 4 POC pair as the last segment in a cascading system.



**GuardShield with Integrated Laser Alignment System**

The GuardShield POC and GuardShield POC cascading light curtains are offered with an integrated laser alignment system consisting of a Class 1, eye safe, constantly powered laser located in the top of the GuardShield transmitter and at the bottom of the GuardShield receiver. There are targets located across from each laser that help facilitate alignment of the light curtain when the laser is emitting visible light.

Each laser emits a low level of visible light. Simply placing a finger or opaque object in front of the laser reflects the laser light back to a photo sensor. This photo sensor causes the laser to switch state from a barely visible low level of emission to a higher level of emission of visible light. Interrupting the visible light below the finger symbol will cause the laser to change state back to a low level of light emission. The visible light will also change to a low level after five minutes.

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 and Cascadable GuardShield are offered in 14 and 30 mm resolutions in protective heights from 320 to 1600 mm. The 160 and 1760 mm protective heights are not offered with the integrated laser alignment systems.

**ArmorBlock Guard I/O Connectivity**

The GuardShield POC and GuardShield Cascadable light curtains are also offered with the Class 1, eye safe, integrated laser alignment system and connectivity to ArmorBlock Guard I/O. The receiver of these light curtains has a five-pin M12 quick-disconnect connector wired to connect to the 1732DS ArmorBlock I/O module, allowing the GuardShield's OSSDs to operate over a DeviceNet safe network.

This version of the GuardShield has limited configurability, i.e., only beam coding, fixed and floating blanking can be configured by setting the appropriate DIP switches and performing the teach function. EDM, Start/Restart interlock, and the auxiliary output are not available in these models.

You can use the ArmorBlock Guard I/O with any safety controller that communicates on DeviceNet using CIP Safety for the control and monitoring of safety circuits. ArmorBlock Guard I/O detects circuit failures at each I/O point while providing detailed diagnostics directly to the controller. With CIP Safety, you can easily integrate safety and standard control systems by using safety and standard messages on the same wire.

The 1732DS ArmorBlock Guard I/O family consists of 24V DC digital I/O modules that communicate on DeviceNet networks.

## 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 <sub>e</sub> 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 <sub>v</sub> ) - 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.)<br>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              | <b>440L-P4J0320YD</b> | 320 (12.6)                  | 30 (1.18)             | 16              | <b>440L-P4K0320YD</b> |
| 480 (18.9)                  | 14 (0.55)             | 48              | 440L-P4J0480YD        | 480 (18.9)                  | 30 (1.18)             | 24              | <b>440L-P4K0480YD</b> |
| 640 (25.2)                  | 14 (0.55)             | 64              | <b>440L-P4J0640YD</b> | 640 (25.2)                  | 30 (1.18)             | 32              | <b>440L-P4K0640YD</b> |
| 800 (31.5)                  | 14 (0.55)             | 80              | <b>440L-P4J0800YD</b> | 800 (31.5)                  | 30 (1.18)             | 40              | <b>440L-P4K0800YD</b> |
| 960 (37.8)                  | 14 (0.55)             | 96              | 440L-P4J0960YD        | 960 (37.8)                  | 30 (1.18)             | 48              | <b>440L-P4K0960YD</b> |
| 1120 (44.1)                 | 14 (0.55)             | 112             | 440L-P4J1120YD        | 1120 (44.1)                 | 30 (1.18)             | 56              | <b>440L-P4K1120YD</b> |
| 1280 (50.4)                 | 14 (0.55)             | 128             | 440L-P4J1280YD        | 1280 (50.4)                 | 30 (1.18)             | 64              | <b>440L-P4K1280YD</b> |
| 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 |

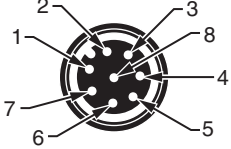
**Note:** Cascadable GuardShields are sold in pairs. To select a transmitter or receiver replace the "C" with an "F" for a cascadable receiver. The cascadable GuardShield standard transmitter is used in these pairs. To order a cascadable transmitter, replace the "C" with a "G" and the "A" with a "D" 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.                |
|----------------------------------------------------------------|------------------------------|------------------------------|-------------------|----------------------------------|---------------------------|---------------|-------------------------|
| <b>Single-Function Safety Relays for 2 N.C. Contact Switch</b> |                              |                              |                   |                                  |                           |               |                         |
| MSR127RP                                                       | 3 N.O.                       | 1 N.C.                       | Removable (Screw) | Monitored Manual                 | 24V AC/DC                 | 5-26          | <b>440R-N23135</b>      |
| MSR127TP                                                       | 3 N.O.                       | 1 N.C.                       | Removable (Screw) | Auto./Manual                     | 24V AC/DC                 | 5-26          | <b>440R-N23132</b>      |
| MSR126                                                         | 2 N.O.                       | None                         | Fixed             | Auto./Manual                     | 24V AC/DC                 | 5-24          | <b>440R-N23117</b>      |
| <b>Modular Safety Relays</b>                                   |                              |                              |                   |                                  |                           |               |                         |
| MSR210P Base<br>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             |
| <b>Muting Modules</b>                                          |                              |                              |                   |                                  |                           |               |                         |
| MSR22LM                                                        | 2 N.O.                       | 1 N.C.                       | Removable         | Auto./Manual                     | 24V DC                    | 5-48          | <b>440R-P23071</b>      |
| MSR42 (requires optical interface to configure 445L-AF6150)    | 2 PNP                        | 2 PNP, configurable          | Removable         | Auto./manual or manual monitored | 24V DC                    | 5-52          | <b>440R-P226AGS-NNR</b> |

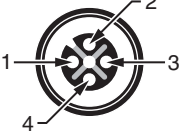
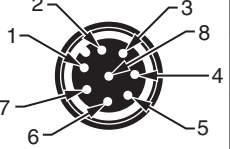


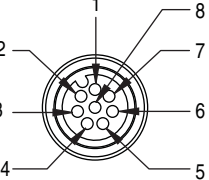
**Standard and Remote Teach Cordsets—Two Required (one for transmitter and one for receiver)**

| 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<br>2 White<br>3 Blue<br>4 Black                                          | 22 AWG<br>300V<br>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<br>2 Brown<br>3 Green<br>4 Yellow<br>5 Grey<br>6 Pink<br>7 Blue<br>8 Red | 24 AWG<br>30V AC/36V DC<br>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.

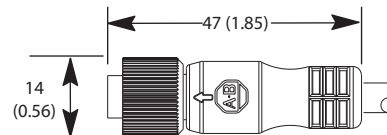
| Face View of Female                                                                 | Description                          | Cat. No.        |
|-------------------------------------------------------------------------------------|--------------------------------------|-----------------|
| <b>Transmitter Patchcord</b>                                                        |                                      |                 |
|  | 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   |
| <b>Receiver Patchcord</b>                                                           |                                      |                 |
|  | 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.     |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <b>Receiver Termination Plug</b>                                                    |                                                                                                                                                                                                                          |              |
|  | Termination plug 8-pin M12 quick disconnect<br>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.

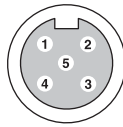
**Cordsets Approximate Dimensions [mm (in.)]**

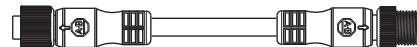
*Dimensions are not intended to be used for installation purposes.*



*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       |



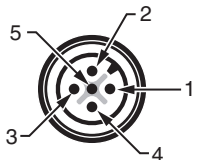
**Interconnecting Patchcords—ArmorBlock I/O Connection**

| 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)<br><b>Note:</b> 4 brackets supplied with each GuardShield pair.                                                 | 440L-AF6101        |
|    | Aluminum middle mounting bracket for vibratory applications                                                                                                             | <b>440L-AF6108</b> |
|    | Power supply: Output—24V DC, 3 Amps, 72 W                                                                                                                               | 1606-XLP72E        |
|    | Laser alignment tool                                                                                                                                                    | <b>440L-ALAT</b>   |
|   | GuardShield laser alignment tool bracket                                                                                                                                | <b>440L-AF6109</b> |
|  | Mounting stand                                                                                                                                                          | <b>440L-AMSTD</b>  |
|  | Vertical shock mount kit                                                                                                                                                | <b>440L-AF6120</b> |
|  | 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<br><br><b>Note:</b> Only for use with standard GuardShield light curtain.                                                            | 440L-AGST320       |
|                                                                                     |                                                                                                                                                                         | 440L-AGST480       |
|                                                                                     |                                                                                                                                                                         | 440L-AGST640       |
|                                                                                     |                                                                                                                                                                         | 440L-AGST800       |
|                                                                                     |                                                                                                                                                                         | 440L-AGST960       |
|  | 8-pin M12 Receiver Termination Plug<br>(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*<br>440L-P2K‡0160YD                   |  | 440L-AM0750300 |  | 440L-AM1250300        |
| 440L-P4*0320Y*<br>440L-P2K‡0320YD                   |                                                                                   | 440L-AM0750450 |                                                                                     | 440L-AM1250450        |
| 440L-P4*0480Y*<br>440L-P2K‡0480YD<br>440L-P4A2500YD |                                                                                   | 440L-AM0750600 |                                                                                     | 440L-AM1250600        |
| 440L-P4*0640Y*<br>440L-P2K‡0640YD                   |                                                                                   | 440L-AM0750750 |                                                                                     | 440L-AM1250750        |
| 440L-P4*0800Y*<br>440L-P2K‡0800YD                   |                                                                                   | 440L-AM0750900 |                                                                                     | 440L-AM1250900        |
| 440L-P4*0960Y*<br>440L-P2K‡0960YD<br>440L-P4A3400YD |                                                                                   | 440L-AM0751050 |                                                                                     | 440L-AM1251050        |
| 440L-P4*1120Y*<br>440L-P2K‡1120YD                   |                                                                                   | 440L-AM0751200 |                                                                                     | <b>440L-AM1251200</b> |
| 440L-P4*1280Y*<br>440L-P2K‡1280YD                   |                                                                                   | 440L-AM0751350 |                                                                                     | 440L-AM1251350        |
| 440L-P4*1440Y*<br>440L-P2K‡1440YD                   |                                                                                   | 440L-AM0751500 |                                                                                     | 440L-AM1251500        |
| 440L-P4*1600Y*<br>440L-P2K‡1600YD                   |                                                                                   | 440L-AM0751650 |                                                                                     | 440L-AM1251650        |
| 440L-P4*1760Y*<br>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.

