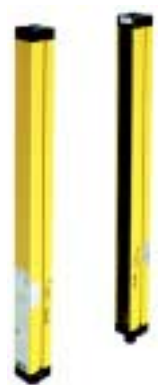


Safety Light Curtains

Point of Operation Control



Description

Point of Operation Control (POC) safety light curtains are active opto-electronic protection devices (AOPD) with resolutions of 14mm (0.55in) or 30mm (1.18in).

Allen-Bradley Guardmaster POC safety light curtains are self-checking and belong to Safety Category 4. They have been designed for industrial applications and are characterized by:

- High degree of reliability
- Maintenance-free components
- Practical size
- Sturdy modular construction
- Universal application possibilities
- Simple installation

Features

- Maintenance-free operation
- Control-reliable solid-state outputs
- State of the art microprocessor technology with custom-designed ASICs (Application Specific Integrated Circuits)
- Easy assembly and alignment
- Quick-disconnect mini style connectors
- Long scanning range and high resolution
- Small housing cross section: 52mm x 55mm (2.05in x 2.17in)
- Fast response time $\leq 15\text{ms}$
- Large excess gain
- Possibility to daisy-chain two sensors (to prevent personnel from standing between protective field and the point of operation)
- Construction in compliance with EN 50100 Category 4 (self-checking)
- Tested and approved for USA, Europe, Canada and Japan

| | |
|------------------------------------|-----------------------------------|
| Maximum scanning range | 6m/18m (19.69ft/59.06ft) |
| Resolution (object sensitivity) | 14mm/30mm (0.55in/1.18in) |
| Maximum height of protective field | 1814mm/1832mm (71.4in/72.1in) |
| Minimum height of protective field | 314mm/332 mm (12.36in/13.07in) |

The optical axis (centre of window) is marked on the end cap.

Specifications

| | |
|---|--|
| Standards | EN 50100 |
| Approvals | BG, cULus and CE marked for all applicable directives |
| Protected Height | 314mm...1832mm (12.3in...72.1in) |
| Scanning Range | 0.3m...6m (0.98ft...19.6ft)/0.3m...18m (0.98ft...59.0ft) |
| Resolution | 14mm/30mm (0.55in/1.18in) |
| Enclosure Rating | IP 65 |
| Connection Type | 7-pin mini style quick-disconnect on transmitter and receiver |
| Supply Voltage U_v Maximum Residual Ripple | 24V DC $\pm 20\%$ 5 Vss |
| Power Consumption | 0.9...1.5 Amps (no-load) |
| Synchronization | Optical, without separate synchronization channel |
| Outputs Minimum output voltage | 2 x PNP, 0.5 A, short circuit protected $U_v - 2V$ |
| Response Time | $\leq 15\text{ms}$ |
| Protection | Short circuit and overload |
| Connection Maximum wire cross section Cable length | 1.0mm ² with jacket 1.5mm ² without jacket 60m (196.8ft) Protection against over-voltage ($\geq 1\text{kV}$) from Level 3 or higher (IEC 801 part 5; 2 kV) between PE and +V. |
| Mode of Operation ¹ | Guard-only with automatic restart |
| Safety Category | Type 4 (self-checking) |
| Requirement | According to EN 50100 |
| Operating Ambient Temp. | 0°C to 55°C (32°F to 131°F) |
| Air Humidity | 15%...95% (not condensing) |
| Storage Temperature | -25°C to 70°C (-13°F to 158°F) |
| Approximate Dimensions Height Housing cross section | Length dependent upon protected height; (see dimensional drawings) 52 mm x 55 mm (2.05in x 2.17in) |

¹ The POC without using a separate control unit, will operate in a guard only mode with automatic restart.

Product Selection

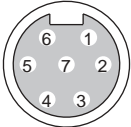
1. Safety Light Curtains

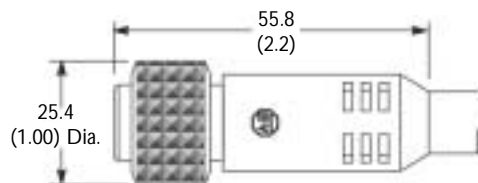
The Allen-Bradley Guardmaster POC safety light curtains are ordered as pairs—transmitter and receiver—and shipped under one part number. After selecting the appropriate light curtain pair, ensure that required interfaces and accessories are ordered as well.

| Size mm (inches) | Resolution mm | Protected Height | | Catalogue Number | Size mm (inches) | Resolution mm | Protected Height | | Catalogue Number |
|------------------|---------------|------------------|------|------------------|------------------|---------------|------------------|------|------------------|
| | | mm | in | | | | mm | in | |
| 300 (12) | 14 | 314 | 12.3 | 440L-P4B0300-N | 1200 (48) | 14 | 1214 | 47.8 | 440L-P4B1200-N |
| | 30 | 332 | 13.0 | 440L-P4D0300-N | | 30 | 1232 | 48.5 | 440L-P4D1200-N |
| 450 (18) | 14 | 464 | 18.2 | 440L-P4B0450-N | 1350 (54) | 14 | 1364 | 53.7 | 440L-P4B1350-N |
| | 30 | 482 | 18.9 | 440L-P4D0450-N | | 30 | 1382 | 54.4 | 440L-P4D1350-N |
| 600 (24) | 14 | 614 | 24.1 | 440L-P4B0600-N | 1500 (60) | 14 | 1514 | 59.6 | 440L-P4B1500-N |
| | 30 | 632 | 24.8 | 440L-P4D0600-N | | 30 | 1532 | 60.3 | 440L-P4D1500-N |
| 750 (30) | 14 | 764 | 30.0 | 440L-P4B0750-N | 1650 (66) | 14 | 1664 | 65.5 | 440L-P4B1650-N |
| | 30 | 782 | 30.8 | 440L-P4D0750-N | | 30 | 1682 | 66.2 | 440L-P4D1650-N |
| 900 (36) | 14 | 914 | 36.0 | 440L-P4B0900-N | 1800 (72) | 14 | 1814 | 71.4 | 440L-P4B1800-N |
| | 30 | 932 | 36.7 | 440L-P4D0900-N | | 30 | 1832 | 72.1 | 440L-P4D1800-N |
| 1050 (42) | 14 | 1064 | 41.9 | 440L-P4B1050-N | | | | | |
| | 30 | 1082 | 42.6 | 440L-P4D1050-N | | | | | |

Please order the devices intended for cascaded applications (host sensor/guest sensor) separately (see page 2-18).

2. Cordsets—2 Required (one for transmitter and one for receiver)

| Female Connector (Sensor End) | | Cable | | | Catalogue Number |
|---|-----------------|--|------------------------------------|---------------|------------------|
| Face View of Female | Connector Style | Pin Wire Colour | Wire Rating | Length—m (ft) | |
|  | Straight | 1 Black 2 White 3 Blue 4 Brown 5 Grey 6 Yellow 7 Green | (5)18AWG (2)20AWG 300V 3A | 2 (6.5) | 889N-F7AG-2 |
| | | | | 5 (16.4) | 889N-F7AG-5 |
| | | | | 10 (32.8) | 889N-F7AG-10 |
| | | | | 15 (49.2) | 889N-F7AG-15 |
| | | | | 20 (65.6) | 889N-F7AG-20 |
| | | | | 30 (98.4) | 889N-F7AG-30 |



Straight Female

Approximate Dimensions. Illustrations are not drawn to scale.


Presence Sensing Safety Devices

Safety Light Curtains


Point of Operation Control

Product Selection

3. Programmable Interface—Optional




| | Input Voltage | Reset | Floating Blanking | Fixed Blanking | PSDI | Muting | Outputs | More Details | Catalogue Number |
|---|---------------|----------------------|-------------------|----------------|------|--------|-----------------------------|--------------|------------------|
|  | 24V DC | Manual/ Automatic | yes | yes | yes | yes | 2 PNP OSSD 1 Aux. PNP | 2-60 | 440L-M8100 |

4. Safety Relay Interfaces—Required

| | Input Voltage | Reset | Floating Blanking | Fixed Blanking | PSDI | Muting | Outputs | More Details | Catalogue Number |
|---|---------------|----------------------|-------------------|----------------|------|--------|---|--------------|------------------|
|  | 24V DC | Manual/ Automatic | no | no | no | no | 4 amp 2 N.O. Safety 1 N.C. Aux. | 2-58 | 440L-M8200 |


Note: For wiring refer to Safeguarding Applications section of this catalogue.

5. Safety Relay Interfaces—Optional







| Relay | Input | Safety Outputs | Auxiliary Outputs | Terminals | Power Supply | Reset | Catalogue Number | | | | |
|--|---|----------------|--------------------------------|-----------|--------------|--|------------------|-------|-----------|------------------|-------------|
|  MSR127RP | 1NC, 2NC, or Light Curtain | 3 N.O. | 1 N.C. | Removable | 24V AC/DC | Automatic/Manual | 440R-N23132 | | | | |
| | | | | | | Monitored Manual | 440R-N23135 | | | | |
| | | | | | 115V AC | Automatic/Manual | 440R-N23131 | | | | |
| | | | | | | Monitored Manual | 440R-N23134 | | | | |
| | | | | | 230V AC | Automatic/Manual | 440R-N23130 | | | | |
| | | | | | | Monitored Manual | 440R-N23133 | | | | |
|  MSR126 | Light Curtain or Single Channel (MSR126T) | 2 N.O. | None | Fixed | 24V AC/DC | Automatic/Manual | 440R-N23117 | | | | |
| | | | | | 115V AC | | 440R-N23116 | | | | |
| | | | | | 230V AC | | 440R-N23115 | | | | |
| | | | | | 24V AC/DC | | 440R-N23114 | | | | |
| | | | | | 115V AC | | 440R-N23113 | | | | |
| | | | | | 230V AC | | 440R-N23112 | | | | |
| | Light Curtain or Single Channel (MSR126R) | | | | 230V AC | 2 N.O. | None | Fixed | 24V AC/DC | Monitored Manual | 440R-N23123 |
| | | | | | | | | | 115V AC | | 440R-N23122 |
| | | | | | | | | | 230V AC | | 440R-N23121 |
| | | | | | | | | | 24V AC/DC | | 440R-N23120 |
| | | | | | | | | | 115V AC | | 440R-N23119 |
| | | | | | | | | | 230V AC | | 440R-N23118 |
|  MSR131RTP | Light Curtain or Safety Mat | 3 N.O. | 2 N.C. 2 PNP Solid State | Removable | 24V AC/DC | Automatic/Manual or Monitored Manual | 440R-C23139 | | | | |
| | | | | | 115V AC | | 440R-C23137 | | | | |
| | | | | | 230V AC | | 440R-C23136 | | | | |

Product Selection

6. Safety Relay Interface (used for muting applications)

| | Input Voltage | Reset | Floating Blanking | Fixed Blanking | PSDI | Muting | Outputs | More Details | Catalogue Number |
|--|---------------|--------|-------------------|----------------|------|--------|------------------------------------|--------------|------------------|
|  MSR22LM | 24V DC | Manual | no | no | yes | yes | 2 N.O. Safety 1 N.C. Aux. | 4-21 | 440R-P23071 |


7. Accessories—Optional

| | Products | Catalogue Number |
|---|---|---------------------------------------|
|  | Steel L-Mounting bracket, fixed (4 per package) | 440L-AF6102 (1 package per system) |
|  | Mounting bracket, adjustable (4 per package) | 440L-AF6103 (1 package per system) |
|  | Mounting bracket, adjustable with shock mount (4 per package) | 440L-AF6104 (1 package per system) |
|  | Power supply: Input—85...265V AC Output—24V DC, 3 Amps | 1794-PS3 |
|  | Laser alignment aid | 440L-ALAT |
| | POC adaptor for laser alignment aid | 440L-ALBRK |
|  | Sliding nuts (4 pieces supplied with POC system) | 440L-AF6105 |

Corner Mirror Selection Table

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

Note: Each mirror reduces maximum scan range by 10% per mirror.

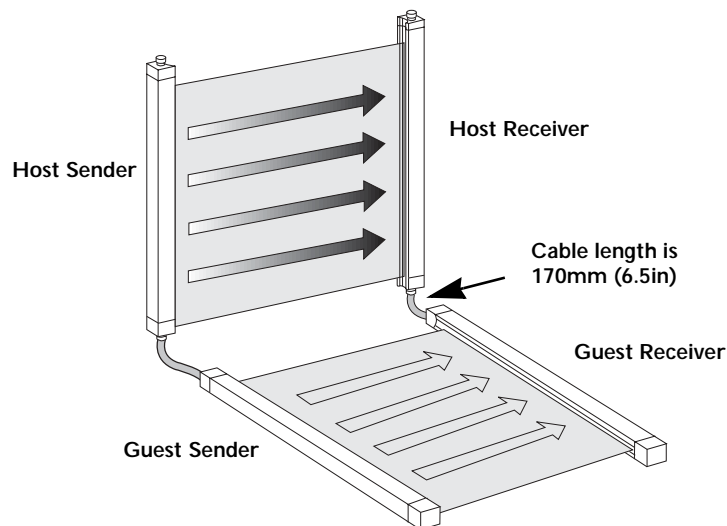
| | For POC Models | Catalogue Number |
|--|----------------|------------------|
|  | 300 | 440L-AM1200300 |
| | 450 | 440L-AM1200450 |
| | 600 | 440L-AM1200600 |
| | 750 | 440L-AM1200750 |
| | 900 | 440L-AM1200900 |
| | 1050 | 440L-AM1201050 |
| | 1200 | 440L-AM1201200 |
| | 1350 | 440L-AM1201350 |
| | 1500 | 440L-AM1201500 |
| | 1650 or 1800 | 440L-AM1201800 |
| Mounting kit for mirrors. Each kit contains 1 bracket with fasteners. Order 2 kits per mirror. | | 440L-AM120BRK |
| Mounting stand for mirror and POC (see page 2-21) | | 440L-AMSTD |

Note: For Approximate Dimensions of mirror and mounting stands, see pages 2-20 and 2-21.

Safety Light Curtains

Point of Operation Control

Product Selection



Safety Light Curtains—Host Guest

The Allen-Bradley Guardmaster POC host guest family of safety light curtains are ordered as pairs—transmitter and receiver—and is shipped under one part number. After selecting the appropriate light curtain pair, ensure that required interfaces and accessories are ordered as well.

| Host—Pairs | | | | | Guest—Pairs | | | | |
|------------------|--------------------------|------------------|------|------------------|------------------|--------------------------|------------------|------|------------------|
| Size mm (inches) | Resolution/ No. of Beams | Protected Height | | Catalogue Number | Size mm (inches) | Resolution/ No. of Beams | Protected Height | | Catalogue Number |
| | | mm | in | | | | mm | in | |
| 900 (36) | 14mm/120 | 914 | 36.0 | 440L-C4B0900-N | 150 (6) | 14mm/20 | 150 | 5.9 | 440L-B4B0150-N |
| | 30mm/60 | 932 | 36.7 | 440L-C4D0900-N | | 30mm/10 | 150 | 5.9 | 440L-B4D0150-N |
| 1050 (42) | 14mm/140 | 1064 | 41.9 | 440L-C4B1050-N | 300 (12) | 14mm/40 | 314 | 12.3 | 440L-B4B0300-N |
| | 30mm/70 | 1082 | 42.6 | 440L-C4D1050-N | | 30mm/20 | 332 | 13.0 | 440L-B4D0300-N |
| 1200 (48) | 14mm/160 | 1214 | 47.8 | 440L-C4B1200-N | 450 (18) | 14mm/60 | 464 | 18.2 | 440L-B4B0450-N |
| | 30mm/80 | 1232 | 48.5 | 440L-C4D1200-N | | 30mm/30 | 482 | 18.9 | 440L-B4D0450-N |
| 1350 (54) | 14mm/180 | 1364 | 53.7 | 440L-C4B1350-N | 600 (24) | 14mm/80 | 614 | 24.1 | 440L-B4B0600-N |
| | 30mm/90 | 1382 | 54.4 | 440L-C4D1350-N | | 30mm/40 | 632 | 24.8 | 440L-B4D0600-N |
| 1500 (60) | 14mm/200 | 1514 | 59.6 | 440L-C4B1500-N | 750 (30) | 14mm/100 | 764 | 30.0 | 440L-B4B0750-N |
| | 30mm/100 | 1532 | 60.3 | 440L-C4D1500-N | | 30mm/50 | 782 | 30.8 | 440L-B4D0750-N |
| | | | | | 900 (36) | 14mm/120 | 914 | 36.0 | 440L-B4B0900-N |
| | | | | | | 30mm/60 | 932 | 36.7 | 440L-B4D0900-N |

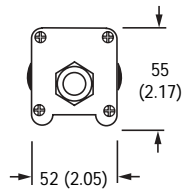
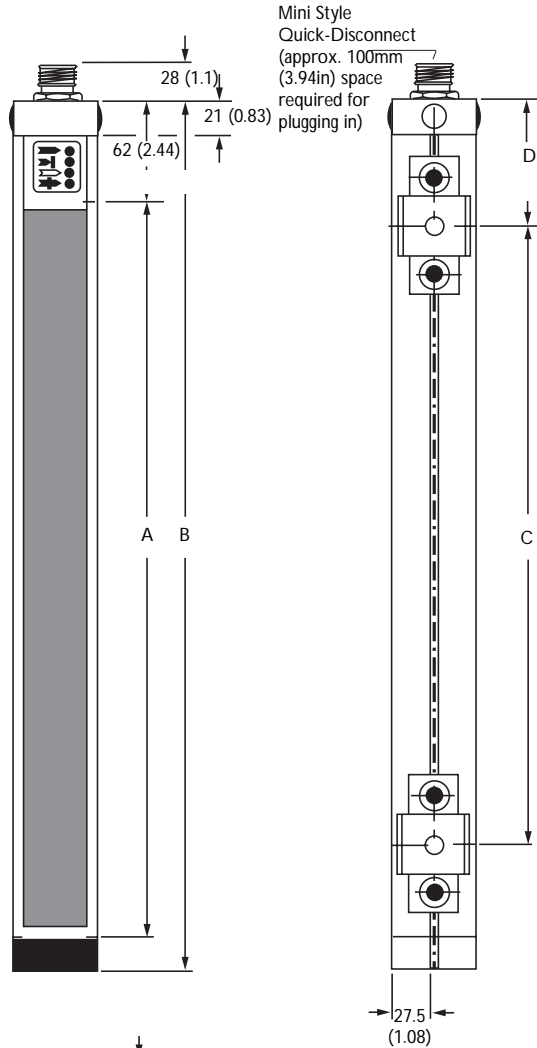
Note: The maximum number of allowable beams in any combination of host/guest is 240 beams.

Note: To order controllers, safety relays and accessories, refer to page 2-28.

Approximate Dimensions—mm (inches)

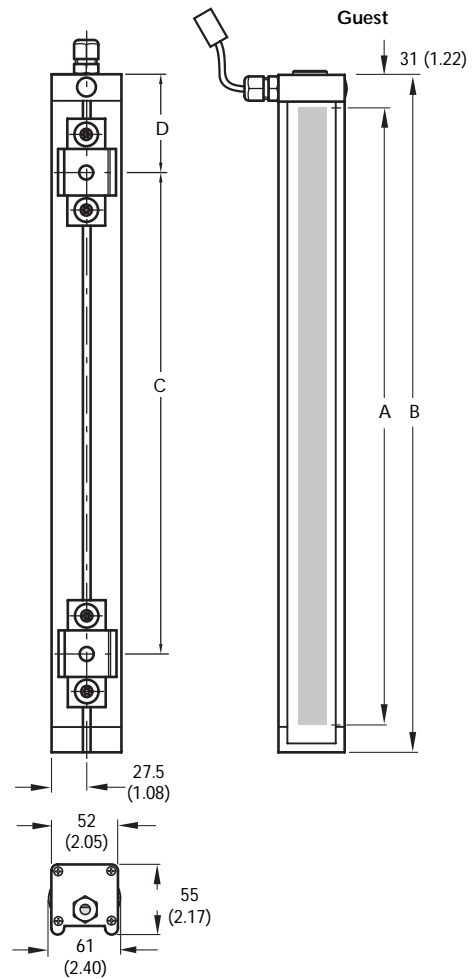
Approximate Dimensions are not intended to be used for installation purposes.

Note: Approximate Dimensions C & D represent the suggested distances of mounting brackets.



Optical Axis = Center of exit window

| Protective Height | A | B | C | D |
|-------------------|------|------|------|----|
| POC 300 | 300 | 384 | 224 | 80 |
| POC 450 | 450 | 534 | 374 | |
| POC 600 | 600 | 684 | 524 | |
| POC 750 | 750 | 835 | 675 | |
| POC 900 | 900 | 985 | 825 | |
| POC 1050 | 1050 | 1135 | 975 | |
| POC 1200 | 1200 | 1285 | 1125 | |
| POC 1350 | 1350 | 1435 | 1275 | |
| POC 1500 | 1500 | 1586 | 1426 | |
| POC 1650 | 1650 | 1736 | 1576 | |
| POC 1800 | 1800 | 1886 | 1726 | |

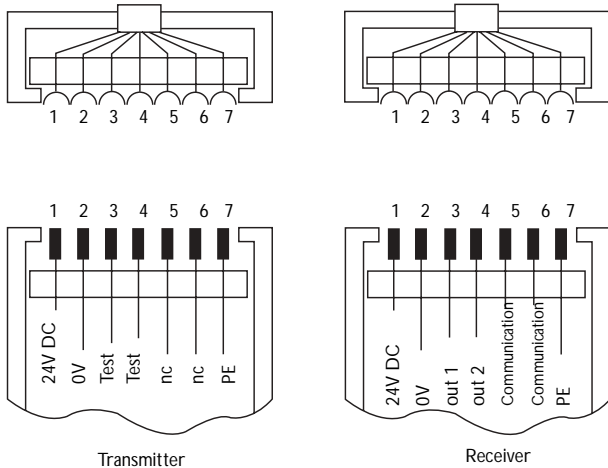


| | Guest | | | |
|-----|-------|-----|-----|----|
| | A | B | C | D |
| 150 | 150 | 200 | * | * |
| 300 | 300 | 350 | 190 | 80 |
| 450 | 450 | 500 | 340 | 80 |
| 600 | 600 | 650 | 490 | 80 |
| 750 | 750 | 800 | 640 | 80 |
| 900 | 900 | 950 | 790 | 80 |

Safety Light Curtains

Point of Operation Control

Typical Wiring Diagrams

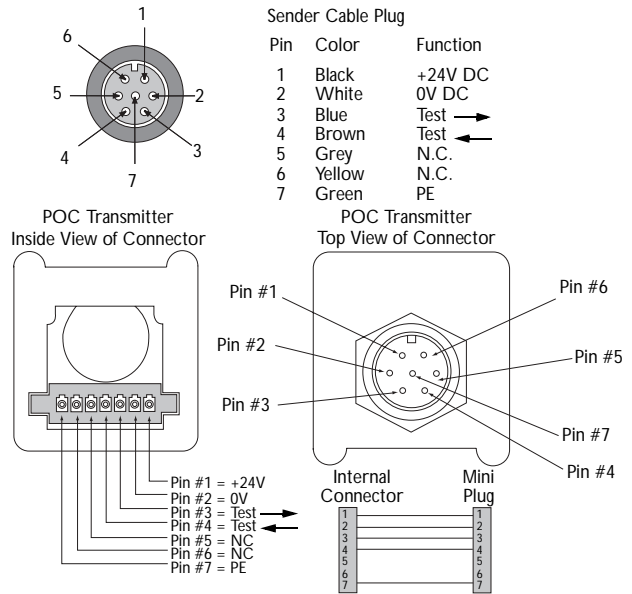
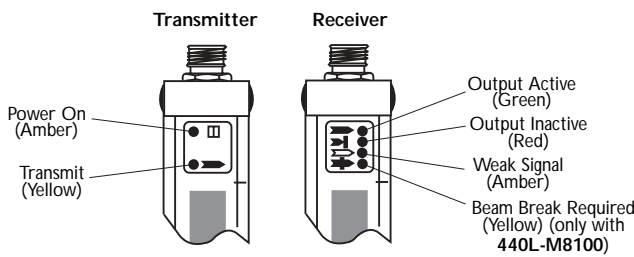


NC = No Connection

Electrical Installation

Connecting the POC components is simple. Cable lengths up to 60m (196.8ft) are permitted (over-voltage protection for level 3 and higher (IEC 801), see Technical Data). The transmitter is connected to a 24V supply using a 7-conductor cable. The receiver is connected to the machine control and 24V supply using a 7-conductor cable. The maximum wire cross section is 1.5mm (0.06in) without jacket; 1mm (0.04in) with jacket. All light curtains come standard with pre-wired mini style quick-disconnect connectors in the end-caps. The POC requires +24V DC ($\pm 20\%$) power supply, which is available from Allen-Bradley Guardmaster.

LED Indicators



POC (transmitter) cable pin diagram

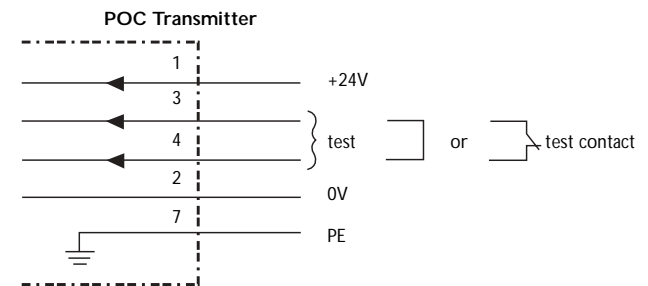
Test Input (Transmitter)

The POC switches to the green condition after the supply voltage has been applied, and the automatic power-up test has been completed. If an external test is desired, a contact (normally closed) can be connected at the test input (MCC = Machine Control Contact). Minimum opening duration ≥ 50 ms.

Continuous current during closed test input: 12mA. In-rush current when closing: 150mA (20ms).

Test input open = Testing = Outputs on receiver inactive (red).

Test input closed = No test Outputs on receiver active (green).



POC connection diagram

Typical Wiring Diagrams (continued)

Outputs (Receiver)

The output voltage U_A of each channel depends on the supply voltage U_V and the switched load and is at least

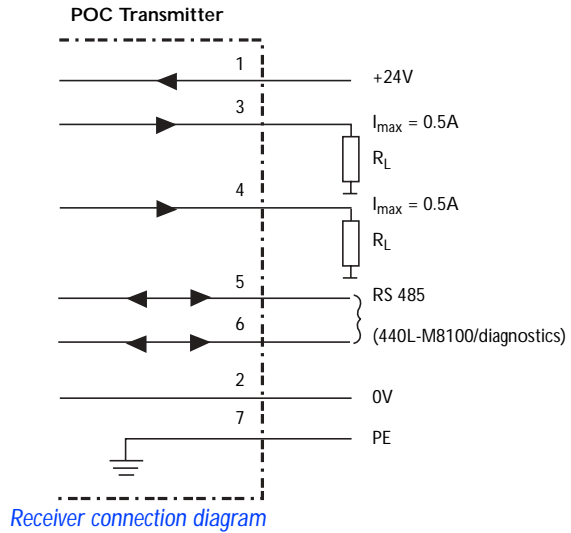
$$U_A = U_V - 2V$$

Both outputs OSSD1 and OSSD2 (OSSD = Output Signal Switching Device) are control reliable, actively monitored PNP solid state outputs. The outputs can carry a maximum of 0.5 Amps and are short circuit protected. If the protected field is clear, the two outputs are HIGH (active).

- An additional supply voltage must not be applied to the outputs.

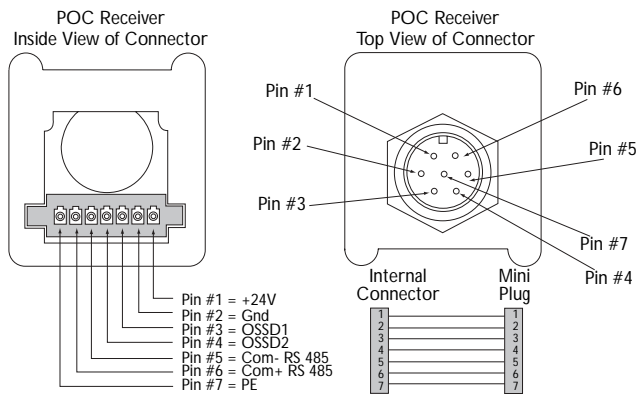
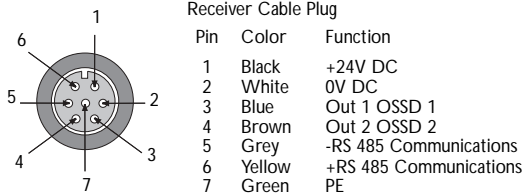


ATTENTION: Both output signals must be processed separately. They must not be connected in series or parallel.



RS-485 Communication Interface

This interface serves to communicate with the **440L-M8100** (optional). If the **440L-M8100** is not used, the connection is not used.



Receiver cable pin diagram