



## ■ Description

A MegaSafe MG4600 system consists of a transmitter and receiver of equal height. The control reliable circuitry is contained within the receiver and transmitter enclosures, eliminating the need for a separate controller and interconnecting cables.

The MG4600 is available with a complete feature set. Individual Beam Indicators are included to simplify alignment. When an infrared beam is out of alignment, the corresponding Individual Beam Indicator will glow red.

The one NO and one NO/NC safety relay outputs are field replaceable.

The choice of either Automatic Start or Start/Restart Interlock modes means that the MG4600 can be configured for either point-of-operation or perimeter guarding.

Exact Channel Select allows user-selected areas of the MG4600 detection zone to be permanently blocked. This is valuable if tooling or other machine parts must permanently obstruct a portion of the zone. Exact Channel Select programming is as easy as pushing a button.

Floating Blanking is useful when process material or parts must transit through the detection zone. Floating Blanking allows up to two beams to be blocked anywhere in the zone.

# MegaSafe®

## MG4600

- Individual beam indicators
- Simple two-box design
- Resolutions available: 14 mm (0.55 in.), 19 mm (0.75 in.), 30 mm (1.18 in.) and 53 mm (2.09 in.)
- Range: 7.5 m (25 ft.) range for the 14 mm resolution, 20 m (65 ft.) range for the 19, 30 and 53 mm resolutions
- Protective heights from 435 to 2096 mm (17 to 82.5 in.) depending on minimum object resolution
- Robust size: 98 x 80 mm (3.9 x 3.1 in.)
- 85-135 VAC or 24 VDC input
- Rugged unit designed for automotive environments
- Field-replaceable weld shield
- Mounting via adjustable brackets or T-slots
- Floating Blanking
- Exact Channel Select
- Choice of operating modes
- Field-replaceable safety relay outputs
- Quick-disconnect connections to meet Ford and DaimlerChrysler requirements
- Meets Ford EL4 Standard

### Options

- MPCE monitoring
- Machine Test Signal (MTS)
- DeviceNet™ Interface
- Alarm/Follow Mode
- Short Range Version
- External Channel Select and Floating Blanking

**A** Go to the Engineering Guide  
For in-depth information on safety standards and use.

Machine primary control element monitoring is required for control reliability. MPCE monitoring is optional with the MG4600.

Quick-disconnect Brad Harrison-style connectors, adjustable mounting brackets, and T-slots make the installation of the MG4600 fast and easy.

### DeviceNet Option

Available as an option, the DeviceNet interface allows communication of nonsafety-related data from the MG4600 to the main machine controller, and other nodes residing on this popular communication bus. DeviceNet is used in many industries including automotive, medical, and semiconductor.

Monitoring of a DeviceNet equipped light curtain provides the process control system with the following non-safety information: manufacturer; product name; operating mode; detection zone status; safety output status; signal strength; number of beams installed; number of beams selected; MPCE monitoring enabled/disabled; floating blanking active/inactive; exact channel select active/inactive; blanking pattern for exact channel select; receiver diagnostic codes; error codes and descriptions.

DeviceNet and the MegaSafe MG4600 provide a powerful automation safeguarding solution.

### MTS Option

This optional feature allows the machine control system to check for proper operation of the light curtain's safety outputs. An input from the main machine controller to the light curtain causes a simulated blocked beam state in the transmitter which, in turn, cycles the safety outputs.

### Alarm/Follow Mode Option

Also an option, this feature permits configuration of the two non-safety auxiliary outputs in either Alarm or Follow mode.

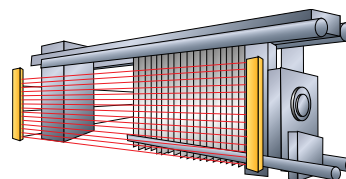
When configured in **Alarm** mode, the auxiliary outputs will be de-energized when the system is behaving normally and energized when the system is in a faulted/interlocked state. The system will remain in this state until the condition is cleared.

When configured for **Follow** mode, the auxiliary outputs mimic the state of the safety outputs. This means that they will be closed when the sensing field is clear and open when the sensing field is broken.

## ■ Applications

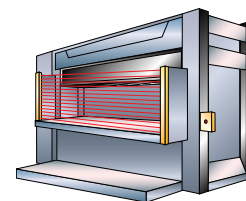
### Application ①

The 20 m range of the MegaSafe MG4600-20, -30 or -50 makes this safety light curtain system an ideal choice for guarding the perimeter of a large filter press. In this application, a small minimum object resolution allows the light curtain to be mounted closer to the machine than many perimeter guarding systems. Because there is no separate control box (all control logic is in the transmitter and receiver), and there are no physical connections between the transmitter and receiver, long cable runs are not required.



### Application ②

The small minimum object resolution, quick response time, and feature set of the MG4600 make it perfect for guarding metal forming equipment. In this application, floating blanking allows the material to bend up through the detection zone without sending a stop signal to the guarded machine.



## ■ Specifications for Transmitter and Receiver

Performance	
<b>Protected Height:</b>	14 mm or 19 mm —438 to 1394 mm (17.2 to 54.9 in.) 30 mm — 523 to 2096 mm (20.6 to 82.5 in.) 50 mm — 700 to 2096 mm (27.6 to 82.5 in.)
<b>Operating Range</b>	<b>MG46SR:</b> 0.3 to 7.5 m (1 to 25 ft.) for 14 mm resolution 0.3 to 9 m (1 to 30 ft.) for 19, 30 and 50 mm resolutions <b>MG46LR:</b> 0.3 to 20 m (1 to 65 ft.) for 19, 30 and 50 mm resolutions (Not available with 14 mm resolution)
<b>Resolution:</b>	14 mm (0.55 in.), 19 mm (0.75 in.), 30 mm (1.18 in.), or 53 mm (2.09 in.); use of exact channel select and/or floating blanking may increase value.
<b>Safety Output Ratings:</b>	6 A at 115 VAC (mini-connectors), 3 A at 115 VAC (micro-connectors), (System contains 8 A relays. To obtain approvals, the relays are derated)
<b>Auxiliary Output Ratings:</b>	3 A at 115 VAC (micro or mini connector)
<b>Safety Output Contacts:</b>	1 N.O. and 1 N.O./N.C. on a field replaceable assembly
<b>Auxiliary Output Contacts:</b>	1 N.O./N.C. on a field replaceable assembly, available in follow mode or alarm mode
<b>MPCE Monitoring Circuit:</b>	50 mA steady state @ 24 VDC
<b>Start/Restart Circuit:</b>	20 mA @ 24 VDC
<b>Effective Aperture Angle:</b>	±2.5° maximum, transmitter and receiver at operating range greater than 3 m (9.8 ft.).
<b>Light Source:</b>	GaAlAs Light Emitting Diode, 850 nm
<b>Transmitter Indicator:</b>	power indication (yellow)
<b>Receiver Indicators:</b>	machine run (green); machine stop (red); interlock/fault (yellow); exact channel select/floating blanking (amber); individual beam indicators (red)
Electrical	
<b>Transmitter:</b>	85-135 VAC, or 24 VDC input power
<b>Receiver:</b>	85-135 VAC, or 24 VDC input power
<b>Transmitter Current Requirements:</b>	300 mA @ 24 VDC, 7 VA @ 115 VAC
<b>Receiver Current Requirements:</b>	420 mA @ 24 VDC, 10 VA @ 115 VAC
Mechanical	
<b>Enclosure:</b>	Polyurethane powder-painted aluminum, yellow color
<b>Cable Length:</b>	Maximum 75 m (247 ft.)
<b>Cable Connections (see drawing)</b>	
<b>Transmitter:</b>	Power Input 3-pin Quick Disconnect (mini or micro connector). MTS (machine test signal), 2-pin Quick Disconnect Micro Connector Separate Connector
<b>Receiver:</b>	Power Input 3-pin Quick Disconnect (mini or micro connector), Safety Relay Outputs 5-pin Quick Disconnect (mini or micro connector). Options: Auxiliary Output 4-pin (micro connector only), MPCE & Remote Start 5-pin (micro connector shielded cable only), and DeviceNet 5-pin (micro connector shielded cable only)
Environmental	
<b>Protection Rating:</b>	NEMA 4, 12; IP65
<b>Operating Temperature:</b>	0 to 55°C (32 to 131°F)
<b>Relative Humidity:</b>	95% maximum, non-condensing
<b>Storage Temperature:</b>	-25 to 75°C (-13 to 167°F)
<b>Vibration:</b>	5-60 Hz maximum on all 3 axes
<b>Shock:</b>	10 g of 0.016 seconds; 1,000 shocks for each axes on two axes
Conformity/Approvals	
<b>Conforming to Standards:</b>	ANSI/RIA R15.06-1999, ANSI B11.19-2003, OSHA 1910.217(c),
<b>Others:</b>	EC type examined to the requirements of IEC 61496-1, -2 for a Type 4 ESPE. TUV Registration Number: BB211081501. CSA Certificate 1193351.

### Response Times for Systems with 14 mm and 20 mm Resolution

Protected Height (mm/in.)	Response Time (seconds)	
	Normally Open (N.O.)	Normally Closed (N.C.)
438/17.2	<0.025	<0.040
523/20.6	<0.030	<0.045
613/24.1	<0.030	<0.045
700/27.6	<0.030	<0.045
785/30.9	<0.035	<0.050
871/34.3	<0.035	<0.050
958/37.7	<0.040	<0.055
1046/41.2	<0.040	<0.055
1133/44.6	<0.040	<0.055
1219/48.0	<0.045	<0.060
1306/51.4	<0.045	<0.060
1394/54.9	<0.045	<0.060

### Response Times for Systems with 30 mm Resolution

Protected Height (mm/in.)	Response Time (seconds)	
	Normally Open (N.O.)	Normally Closed (N.C.)
523/20.6	<0.025	<0.040
700/27.6	<0.025	<0.040
871/34.3	<0.025	<0.040
1046/41.2	<0.030	<0.045
1219/48.0	<0.030	<0.045
1394/54.9	<0.030	<0.045
1570/61.8	<0.035	<0.050
1746/68.7	<0.035	<0.050
1920/75.6	<0.040	<0.055
2096/82.5	<0.040	<0.055

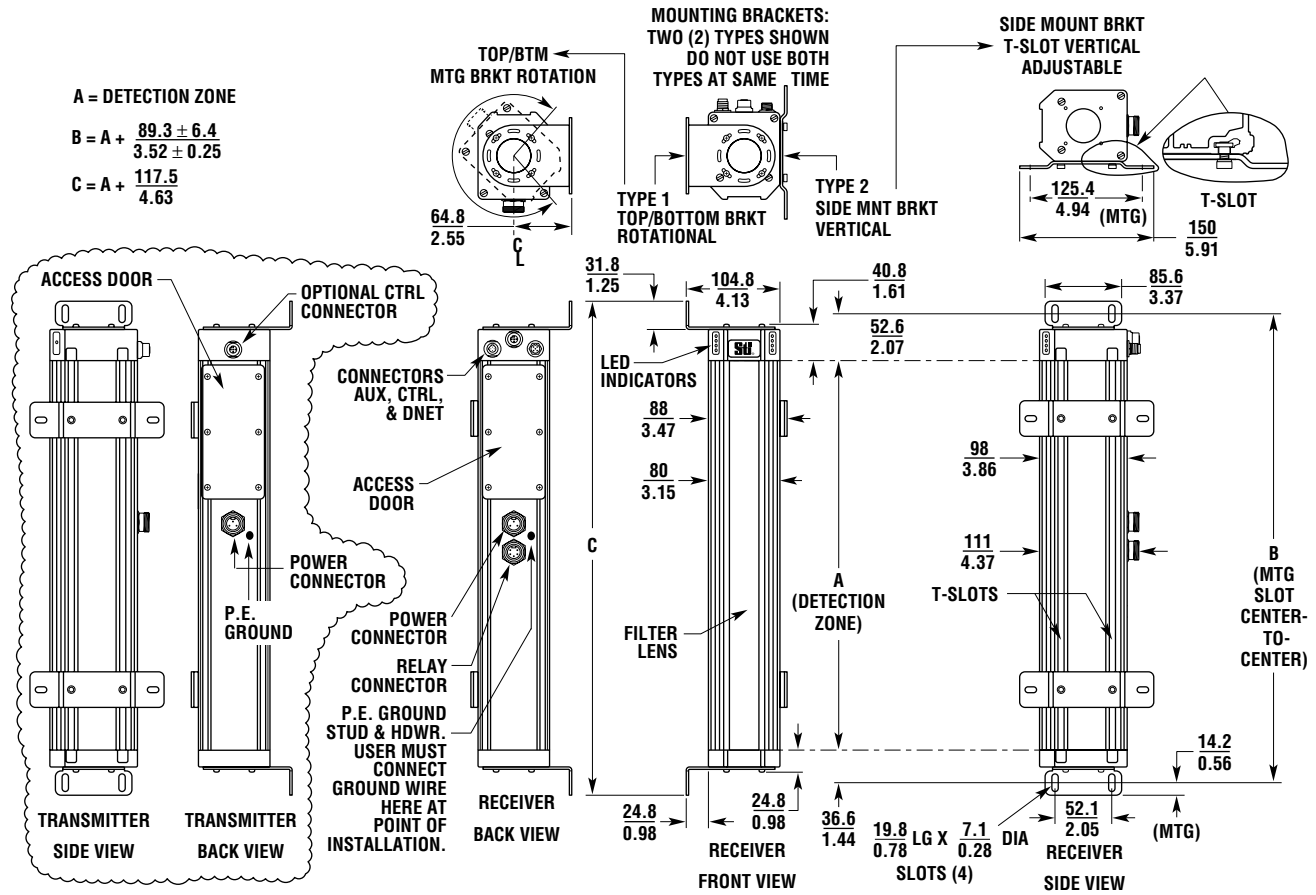
### Response Times for Systems with 50 mm Resolution

Protected Height (mm/in.)	Response Time (seconds)	
	Normally Open (N.O.)	Normally Closed (N.C.)
700/27.6	<0.025	<0.040
1046/41.2	<0.025	<0.040
1394/54.9	<0.025	<0.040
1746/68.7	<0.025	<0.040
2096/82.5	<0.025	<0.040

Specifications are subject to change without notice.

This drawing is available in CAD format at [www.sti.com/curtains/MG4600/](http://www.sti.com/curtains/MG4600/)

## ■ Dimensions—mm/in.



D safety light curtains

## MegaSafe MG4600 Dimensions

MG4600-14 and MG4600-20		
A mm/in.	B mm/in.	C mm/in.
438/17.2	527/20.8	556/21.9
523/20.6	612/24.1	641/25.2
613/24.1	702/27.7	731/28.8
700/27.6	789/31.1	818/32.2
785/30.9	874/34.4	903/35.5
871/34.3	960/37.8	989/38.9
958/37.7	1047/41.2	1076/42.4
1046/41.2	1135/44.7	1164/45.8
1133/44.6	1222/48.1	1251/49.2
1219/48.0	1308/51.5	1337/52.6
1306/51.4	1395/54.9	1424/56.1
1394/54.9	1483/58.4	1512/59.5

MG4600-30		
A mm/in.	B mm/in.	C mm/in.
523/20.6	612/24.1	641/25.2
700/27.6	789/31.1	818/32.2
871/34.3	960/37.8	989/38.9
1046/41.2	1135/44.7	1164/45.8
1219/48.0	1308/51.5	1337/52.6
1394/54.9	1483/58.4	1512/59.5
1570/61.8	1659/65.3	1688/66.4
1746/68.7	1834/72.2	1863/73.3
1920/75.6	2009/79.1	2038/80.2
2096/82.5	2185/86.0	2214/87.2

MG4600-50		
A mm/in.	B mm/in.	C mm/in.
700/27.6	789/31.1	818/32.2
1046/41.2	1135/44.7	1164/45.8
1394/54.9	1483/58.4	1512/59.5
1746/68.7	1830/72.1	1859/73.2
2096/82.5	2185/86.0	2214/87.2



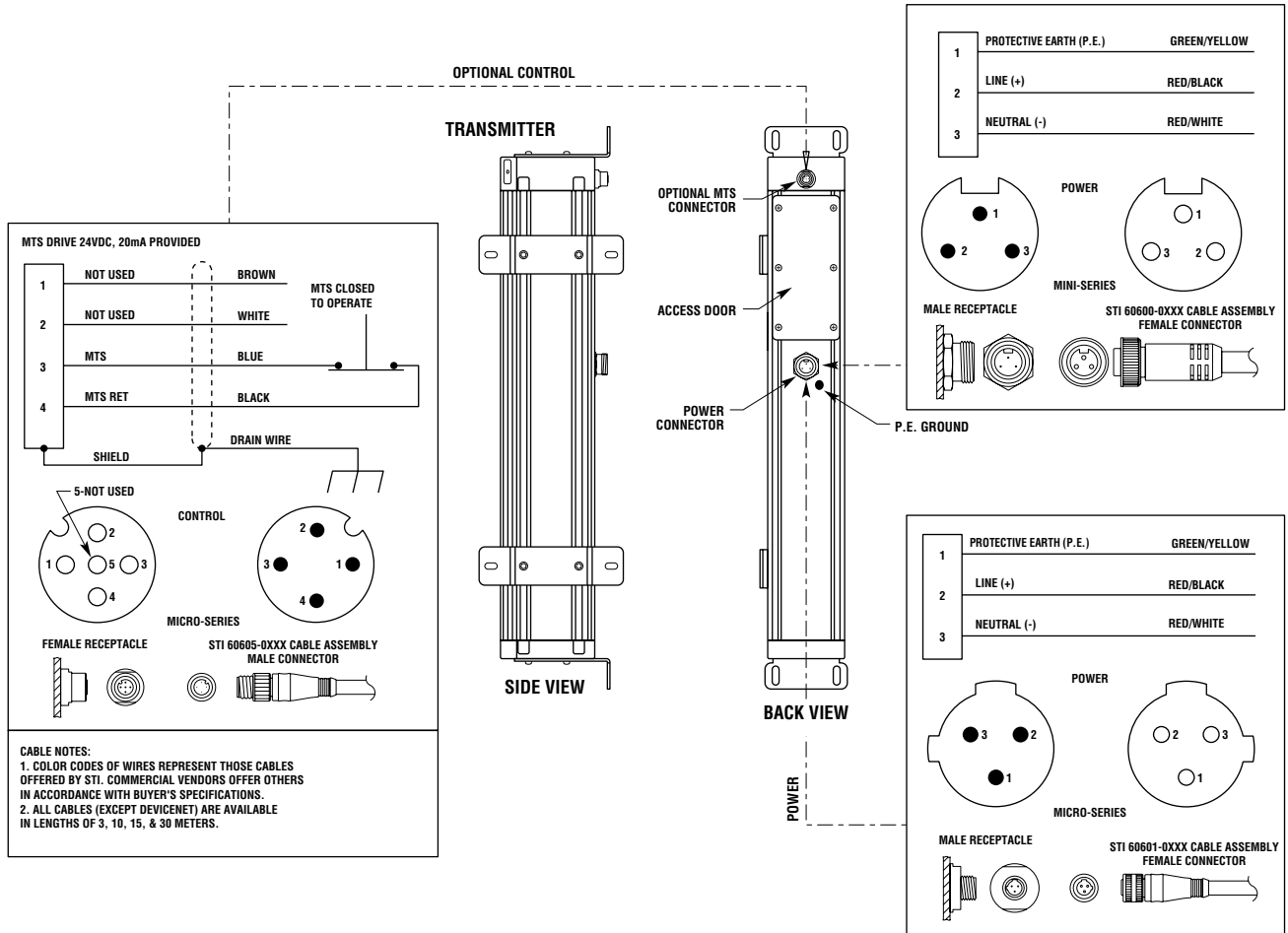
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For the Latest Information  
 On the Internet: [www.sti.com](http://www.sti.com) or [www.omron.ca](http://www.omron.ca)



### ■ Wiring — Transmitter

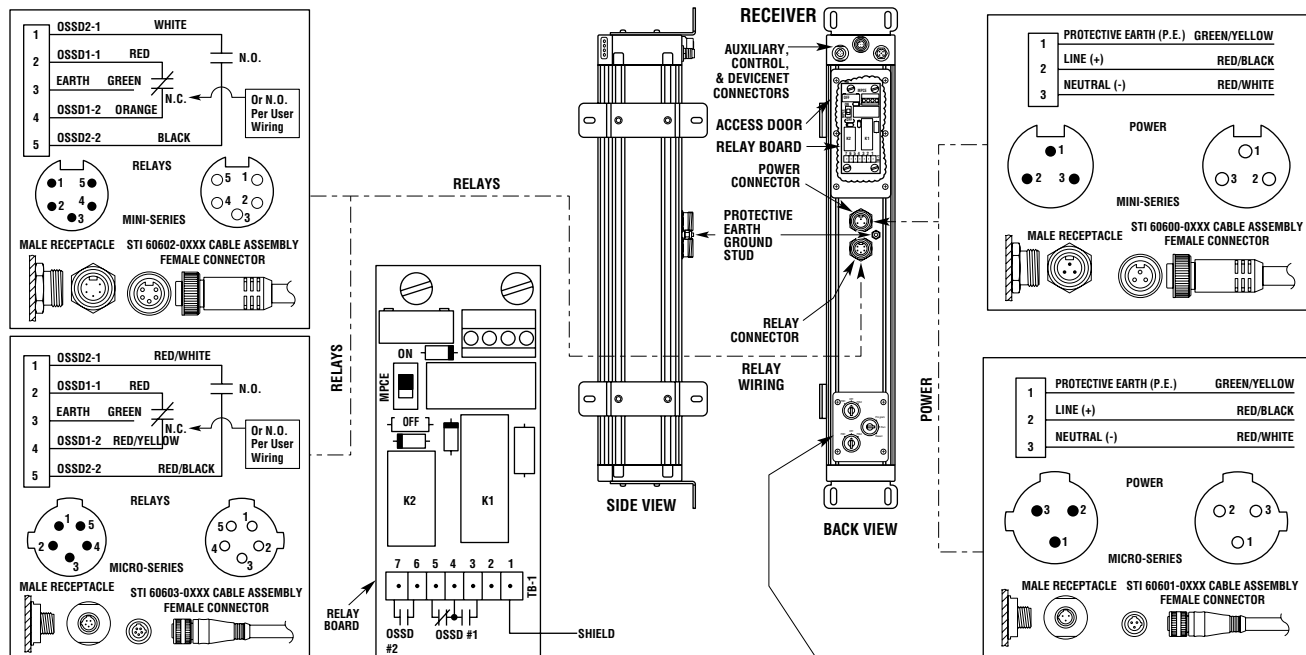


**A** Go to the Engineering Guide  
For in-depth information on safety standards and use.



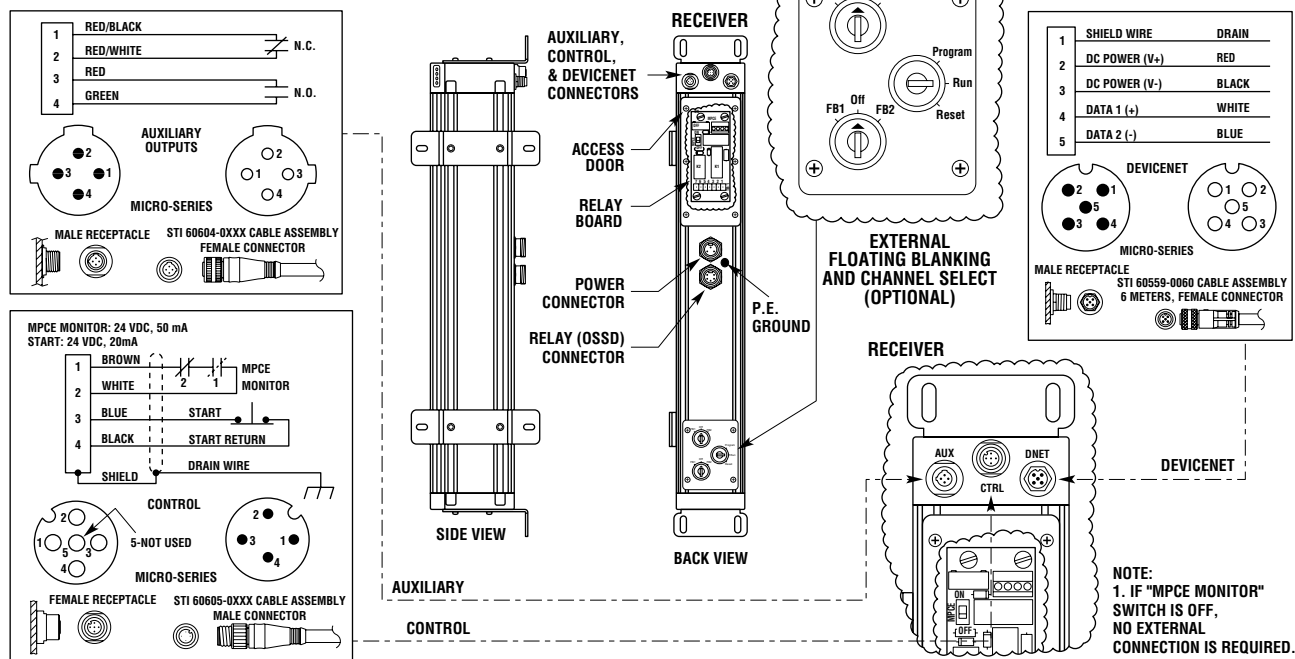
■ **Wiring — Receiver**

**Receiver Power and Relay Wiring**



D safety light curtains

**Receiver Endcap Option Connections: Auxiliary Outputs, Control and DeviceNet**



## ■ Ordering

To order a MegaSafe MG4600 system, simply fill in the fields in the model number sequence given below. Each field is numbered and information on completing a specific field can be found in the sections which follow.

\_\_\_\_ - \_\_\_\_ - \_\_\_\_ - \_\_\_\_ - \_\_\_\_ - \_\_\_\_ - X - \_\_\_\_ R - \_\_\_\_ S - \_\_\_\_ - \_\_\_\_ - \_\_\_\_ - \_\_\_\_  
**1**   **2**   **3**   **4**   **5**   **6**   **6**   **6**   **7**   **8**   **9**   **10**   **11**

Example: MG46SR-20-435-A2-BK-10X-10R-15S-10A-15C-10M-RV-D

This system is short range, has 20 mm (0.79 in.) minimum object resolution, a 435 mm (17.2 in.) coverage height, 115 VAC operating power with micro connector, external channel select and floating blanking switches, 10 m (33 ft.) transmitter and receiver cables, 15 m (49 ft.) safety output cable, auxiliary outputs configured in the “alarm” mode with 10 m (33 ft.) cable, MPCE and remote start connection with 15 m (49 ft.) cable, MTS connector with 10 m (33 ft.) cable, DeviceNet interface, and 6 m (20 ft.) DeviceNet cable.

**1** Information required. Represents the system operating range. For applications where the transmitter and receiver will be mounted less than 9 m (29.5 ft.) apart, please select the SR version.

Designator	Description
MG46SR	0.3 to 7.5 m (1 to 25 ft.) for 14 mm resolution
	0.3 to 9 m (1 to 30 ft.) for 20, 30 and 50 mm resolutions
MG46LR	0.3 to 20 m (1 to 65 ft.) for 20, 30 and 50 mm resolutions (Not available for 14 mm)

**2** Information required. Represents the minimum object resolution of the system.

Designator	Description
14	14 mm (0.55 mm)
20	19 mm (0.75 inch)
30	30 mm (1.18 inch)
50	53 mm (2.09 inch)

**3** Information required. Represents coverage height, which is a function of minimum object resolution. Designators are divided into three sections.

### 14 & 20 mm Minimum Object Resolution Systems

Designator	Description
435	438 mm (17.2 in.)
520	523 mm (20.6 in.)
610	613 mm (24.1 in.)
700	700 mm (27.6 in.)
785	785 mm (30.9 in.)
870	871 mm (34.3 in.)
955	958 mm (37.7 in.)
1045	1046 mm (41.2 in.)
1130	1133 mm (44.6 in.)
1215	1219 mm (48.0 in.)
1305	1306 mm (51.4 in.)
1390	1394 mm (54.9 in.)

### 30 mm Minimum Object Resolution Systems

Designator	Description
520	523 mm (20.6 in.)
700	700 mm (27.6 in.)
870	871 mm (34.3 in.)
1045	1046 mm (41.2 in.)
1215	1219 mm (48.0 in.)
1390	1394 mm (54.9 in.)
1570	1570 mm (61.8 in.)
1745	1746 mm (68.7 in.)
1920	1920 mm (75.6 in.)
2095	2096 mm (82.5 in.)

### 50 mm Minimum Object Resolution Systems

Designator	Description
700	700 mm (27.6 in.)
1045	1046 mm (41.2 in.)
1390	1394 mm (54.9 in.)
1745	1746 mm (68.7 in.)
2095	2096 mm (82.5 in.)

**4** Information required. Represents input power as well as input power and safety output connector type.

Designator	Description
A1	115 VAC, Mini Power Input and Safety Output Connectors
A2	115 VAC, Micro Power Input and Safety Output Connectors
D1	24 VDC, Mini Power Input and Safety Output Connectors
D2	24 VDC, Micro Power Input and Safety Output Connectors

**5** Information optional. Indicates the addition of External Channel Select and Floating Blanking switches.

Designator	Description
(Blank)	No option
BK	External C.S. and F.B. installed

**6** Information optional. Represents transmitter (X) and receiver (R) and safety output (S) cable length. Connector style on these cables will match the style specified under **4**, input power. Example: If a micro-style connector was ordered for the input power connection (option A2 or D2), the transmitter, receiver and safety output connections will have micro-style connectors.

Designator	Description
(Blank)	No cable
3	3 m (10 ft.)
10	10 m (33 ft.)
15	15 m (49 ft.)
30	30 m (99 ft.)

⑦ Information optional. Indicate if you would like the optional auxiliary outputs, the associated connector, and if you would like to have a cable supplied with them. This cable has a micro-style connector. Designators and descriptions follow.

Designator	Description
(Blank)	No auxiliary output or cable
A	Auxiliary output. Operates in alarm mode. No cable supplied.
3A	Auxiliary output. Operates in alarm mode. 3 m (10 ft.) cable supplied.
10A	Auxiliary output. Operates in alarm mode. 10 m (33 ft.) cable supplied.
15A	Auxiliary output. Operates in alarm mode. 15 m (49 ft.) cable supplied.
30A	Auxiliary output. Operates in alarm mode. 30 m (99 ft.) cable supplied.
F	Auxiliary output. Operates in follow mode. No cable supplied.
3F	Auxiliary output. Operates in follow mode. 3 m (10 ft.) cable supplied.
10F	Auxiliary output. Operates in follow mode. 10 m (33 ft.) cable supplied.
15F	Auxiliary output. Operates in follow mode. 15 m (49 ft.) cable supplied.
30F	Auxiliary output. Operates in follow mode. 30 m (99 ft.) cable supplied.

⑧ Information optional. Indicate if you would like the optional MPCE monitoring and remote start connection, and what length cable you would like to have supplied with it. This cable has a micro-style connector. Designators and descriptions are given below.

Designator	Description
(Blank)	No MPCE/remote start connection or cable.
3C	MPCE/remote start connection. 3 m (10 ft.) cable supplied.
10C	MPCE/remote start connection. 10 m (33 ft.) cable supplied.
15C	MPCE/remote start connection. 15 m (49 ft.) cable supplied.
30C	MPCE/remote start connection. 30 m (99 ft.) cable supplied.

**Safety Standards and Precautions**

All models of the MegaSafe MG4600 meet ANSI/RIA R15.06-1999 and ANSI B11.19-2003. When used with mechanical power presses, OSHA industrial safety standards apply as stated in 1910.217(c). For other applications, the machine guarding requirements found in section 1910.212 apply. The MegaSafe MG4600 series meets ANSI control reliability requirements for point-of-operation presence sensing devices.

MegaSafe MG4600 systems have been EC type examined to the requirements of IEC 61496-1, -2 for a Type 4 ESPE.

The MegaSafe MG4600 should only be used on machinery that can consistently and immediately stop anywhere in its cycle or stroke. Never use a MegaSafe MG4600 on a full revolution clutched power press or machine. If the light curtain does not protect all access to the point of operation, the unprotected access must be guarded by other appropriate devices such as mechanical guards.

The purchaser, installer and employer have the responsibility to meet all local, state and federal government laws, rules, codes or regulations relating to the proper use, installation, operation and maintenance of this control and the guarded machine. See the Installation and Operation Manual for additional information.

All application examples described are for illustration purposes only. Actual installations will differ from those indicated.

⑨ Information optional. Indicate if you would like the optional Machine Test Signal (MTS) connection, and what length cable you would like to have supplied with it. This cable has a micro-style connector. Designators and descriptions are given below.

Designator	Description
(Blank)	No MTS connection or cable.
3M	MTS connection. 3 m (10 ft.) cable supplied.
10M	MTS connection, 10 m (32 ft.) cable supplied.
15M	MTS connection, 15 m (49 ft.) cable supplied.
30M	MTS connection, 30 m (99 ft.) cable supplied.

⑩ Information optional. Indicate if you would like the optional DeviceNet interface.

Designator	Description
(Blank)	No DeviceNet
RV	DeviceNet installed

⑪ Information optional. Indicate if you would like the optional DeviceNet cable.

Designator	Description
(Blank)	No DeviceNet
D	6 m (19.7 ft.) cable

 For additional MG4600 cables, see light curtain accessories on page D198

 For information on safety light curtain accessories, see page D184

D  
safety light curtains