# Safety Solutions

BANNER®
more sensors, more solutions






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# Complete Safety Solutions from Banner



## Safety Light Curtains

- Intuitive and easy-to-use and set up
- End-to-end sensing
- Heavy-duty aluminum housing and recessed window to avoid damage in harsh environments
- Highly visible alignment and diagnostic indicators
- IP69 hygienic models available for washdown environments
- Cascade capable models available
- See page 10



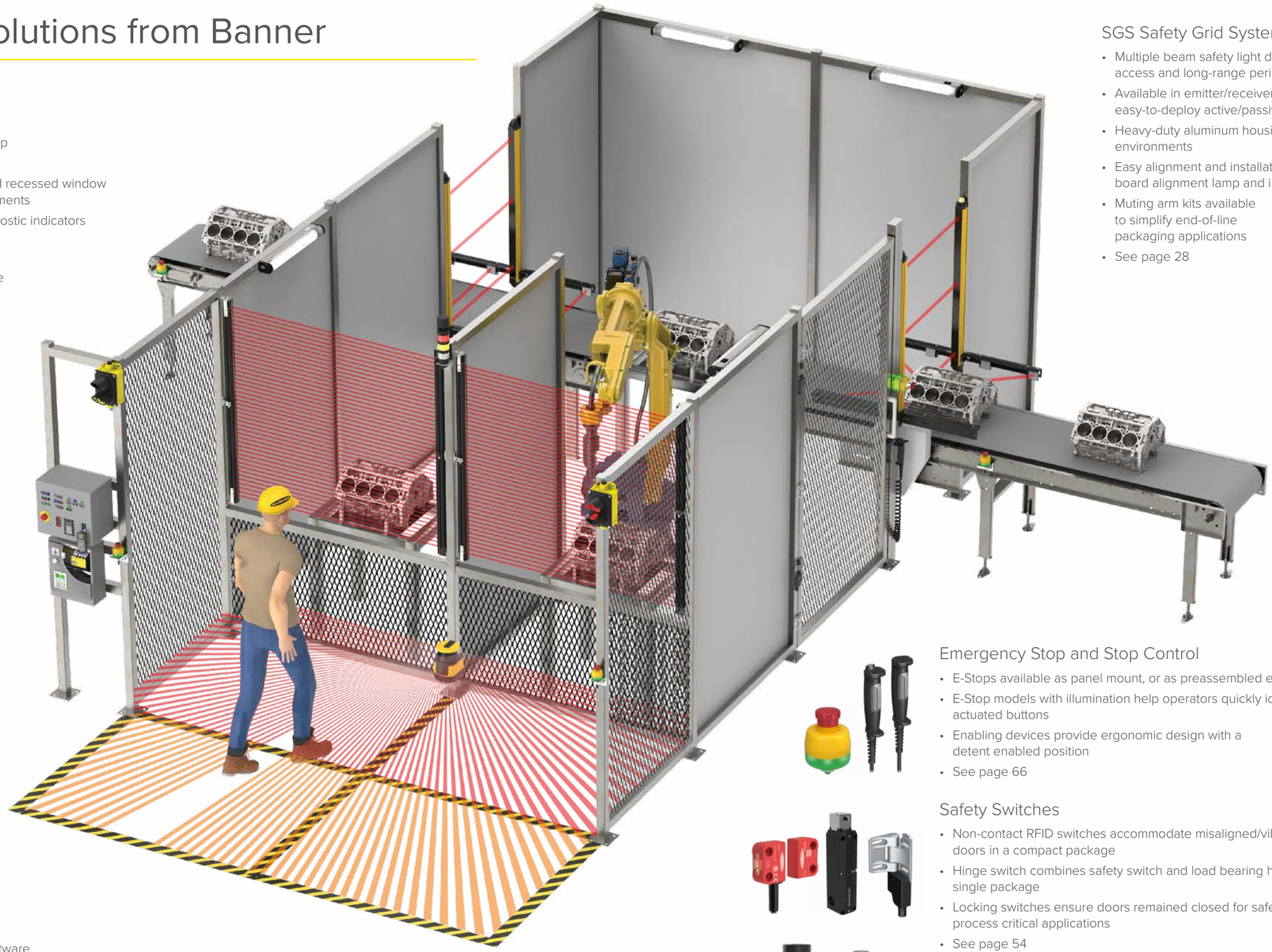
## Safety Controllers

- Up to eight expansion I/O modules can be added as your safety application grows or changes
- Configuration software is so simple that you will be programming in minutes
- Simulator functionality allows users to test their configurations without being connected to a controller
- See page 42



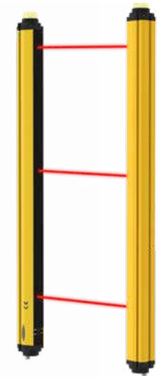
## Safety Laser Scanners

- Two-dimensional laser scanner with easy-to-use software
- Programming of irregular shaped warning and detection zones
- 275° scanning angle with selectable resolutions and 5.5 m range
- See page 32



## SGS Safety Grid Systems

- Multiple beam safety light devices for access and long-range perimeter guarding
- Available in emitter/receiver models and in easy-to-deploy active/passive models
- Heavy-duty aluminum housing for tough environments
- Easy alignment and installation with on-board alignment lamp and indicators
- Muting arm kits available to simplify end-of-line packaging applications
- See page 28





## Emergency Stop and Stop Control

- E-Stops available as panel mount, or as preassembled enclosures
- E-Stop models with illumination help operators quickly identify actuated buttons
- Enabling devices provide ergonomic design with a detent enabled position
- See page 66



## Safety Switches

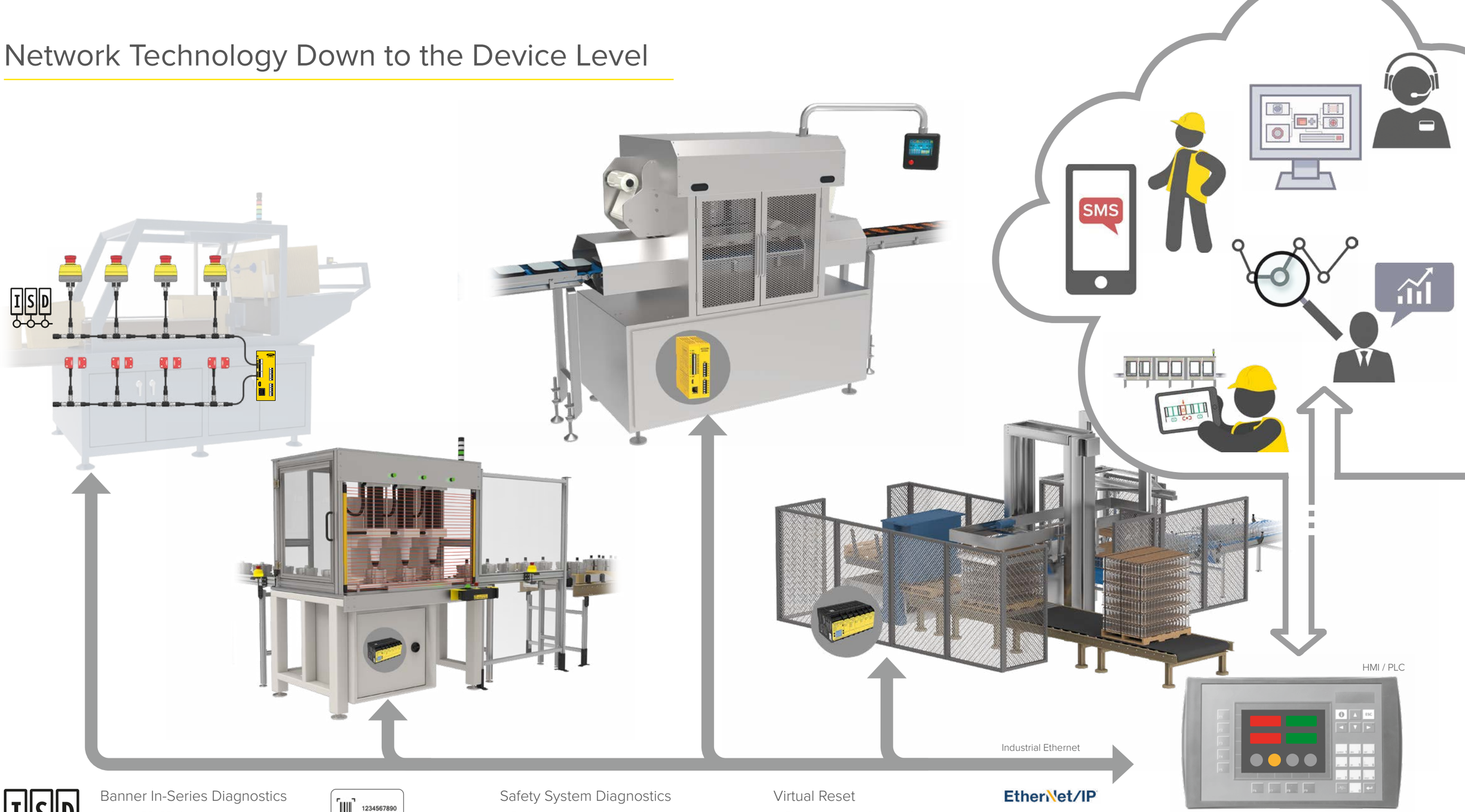
- Non-contact RFID switches accommodate misaligned/vibrating doors in a compact package
- Hinge switch combines safety switch and load bearing hinge in a single package
- Locking switches ensure doors remained closed for safety and process critical applications
- See page 54



## Lighting and Indication

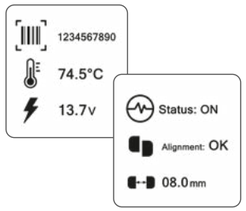
- Preassembled and preconfigured multi-segment LED tower light indicators
- Programmable multicolor LED indicators, panel mount models available
- Pro Editor software offers a wide variety of color and animation options

# Network Technology Down to the Device Level




## Banner In-Series Diagnostics

- Up to 32 ISD devices connected with one in-series cable communicate directly with PLC/HMI
- ISD provides an array of data including device status, voltage, temperature, RFID tag value, sensing distance, and more




## Safety System Diagnostics

- Reduce downtime by quickly diagnosing safety events and displaying them on the HMI
- Prevent downtime with ISD preventive maintenance alerts

## Virtual Reset

- Eliminate physical button & wires
- Reset fron touch screen HMI over Industrial Ethernet

EtherNet/IP
Modbus TCP/IP
PROFINET
EtherCAT

## Intuitive setup and PLC integration

## Free, easy-to-use PC software

- Export tag feature for easy tag creation in a PLC (patent pending)

# Banner In-Series Diagnostics (ISD)

## Easy-to-Implement Diagnostic Capabilities for Complex Safety Systems

In-Series Diagnostics allows connection of up to 32 devices with one in-series connection and communicate directly with the most commonly used PLCs.

When a safety event occurs the system receives an alert that includes information about which safety device tripped, making troubleshooting a breeze.

In-Series Diagnostics provides an array of additional data points for each in-series device used, including a unique tag value, internal temperature, voltage, and more, along with device-specific details such as the alignment and distance between a safety switch's sensor and actuator.

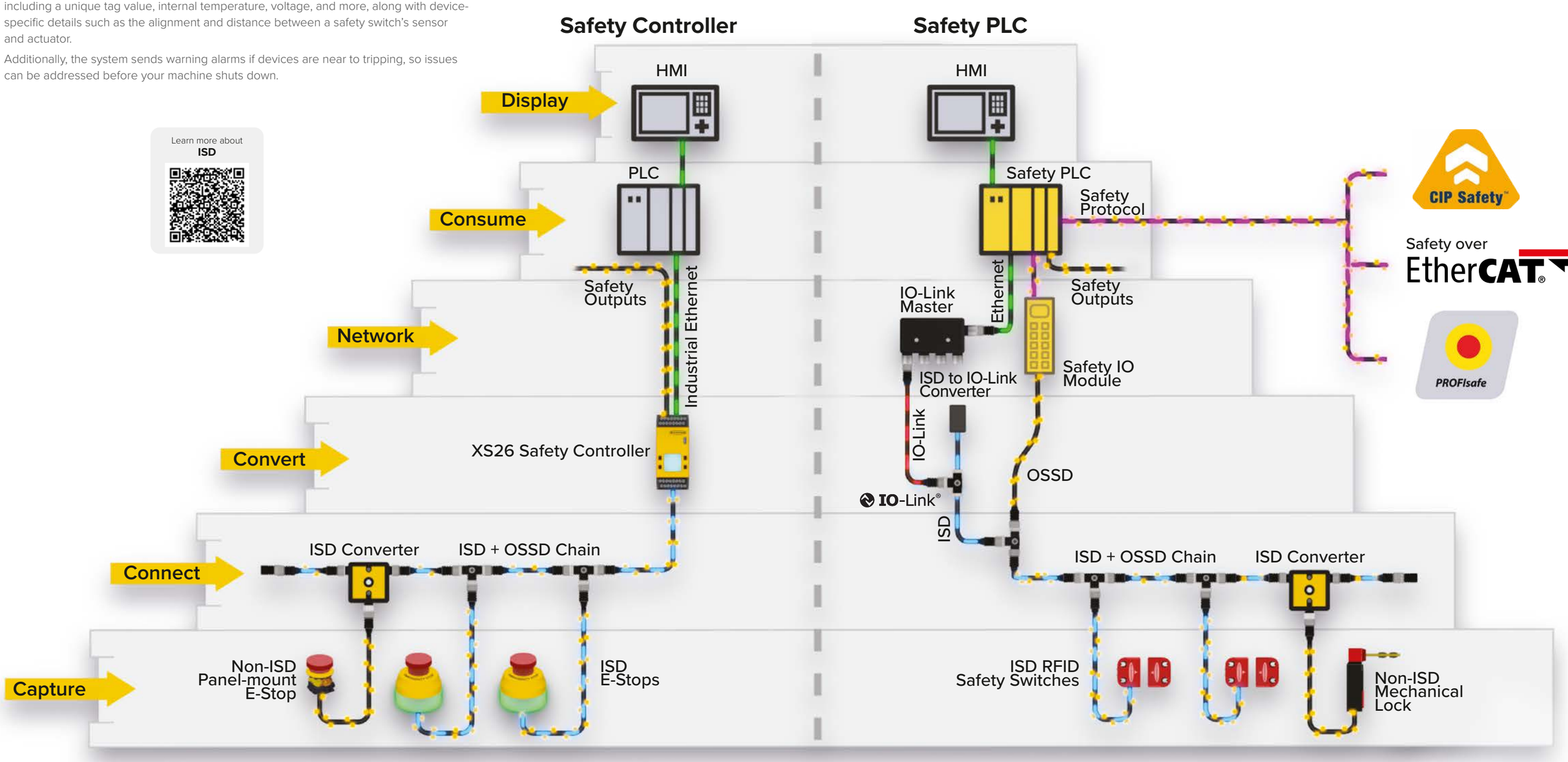
Additionally, the system sends warning alarms if devices are near to tripping, so issues can be addressed before your machine shuts down.

Learn more about **ISD**

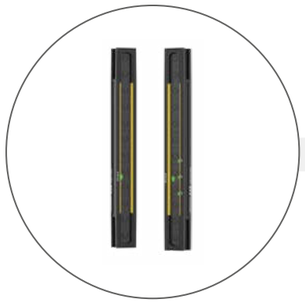
Cut Costs

Simplify Installation & Troubleshooting

Prevent & Reduce Downtime



# Choosing a Banner Safety Light Curtain



Start with the S4B

- Heavy-duty housing
- 30mm resolution
- Zone & alignment indication

If the following are needed:
- Cascade
- 14mm resolution
- Blanking
- EDM
- IP67



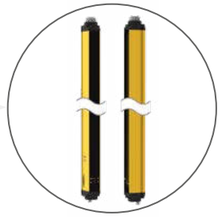
select EZ-SCREEN LS

If the following are needed:
- Up to 18 m range
- Reduced resolution
- Latch



select EZ-SCREEN

If the following is needed:
- Up to 60 m range



select SGS Grids

If the following are needed:
- Compact



select EZ-SCREEN LP

If the following is needed:
- Very compact



select SLC4

| |  S4B |  EZ-SCREEN LS |  EZ-SCREEN LP |
|---|---|---|---|
| **Resolution (mm)** | 30 | 14, 23, 40 | 14, 25 |
| **Range (m)** | 12 | 12 | 7 |
| **Defined Area (mm)** | 300 to 1800 | 280 to 2380 | 270 to 1250 |
| **Integral Muting** | | | ✓ |

|  SLC4 |  EZ-SCREEN |  SGS Grids |
|---|---|---|
| 14, 24 | 14, 30 | 300, 400, 500 |
| 2 | 6, 18 | 8, 30, 60 |
| 160 to 320 | 150 to 2400 | 500 to 1200 |
| | | ✓ |

# Safety Light Curtain Selection Guide



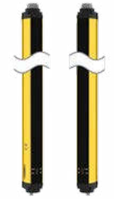








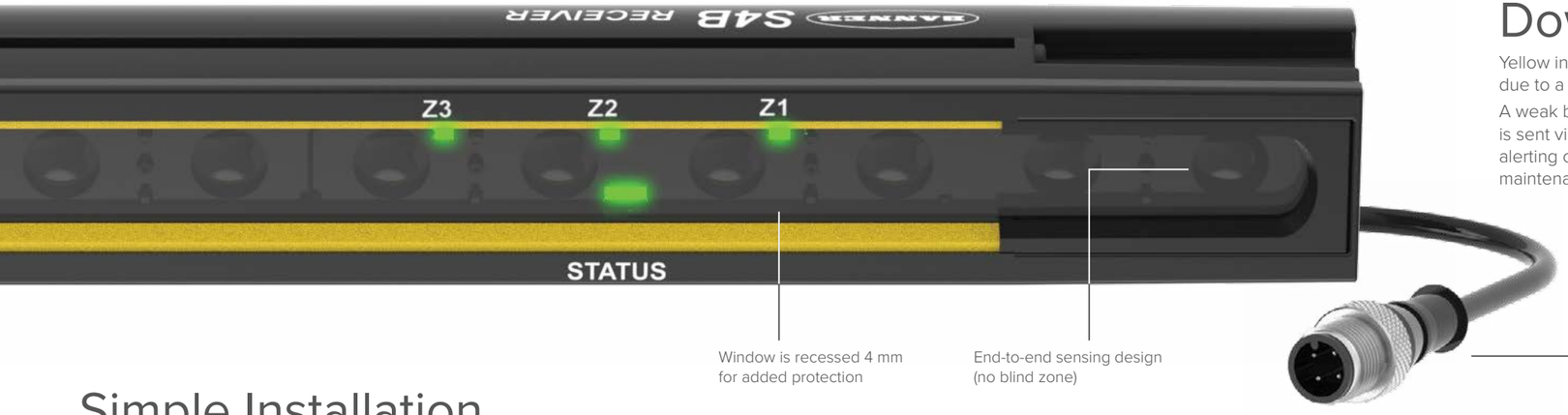




| | S4B | EZ-SCREEN LS | EZ-SCREEN 14/30 | | EZ-SCREEN LP | SLC4 | EZ-SCREEN LS2 | SGS Grids |
|---|---|---|---|---|---|---|---|---|
| | p. 14 | p. 16 | p. 20 | | p. 22 | p. 24 | p. 26 | p. 28 |
| **Type IEC 61496-1, -2** | Type 4 | Type 4 | Type 4 | | Type 4 | Type 4 | Type 2 | Type 4 |
| **Safety Rating EN ISO 13849-1; IEC 61508; IEC 62061** | Category 4 PL e; SIL3 | Category 4 PL e; SIL3 | Category 4 PL e; SIL3 | | Category 4 PL e; SIL3 | Category 4 PL e; SIL3 | Category 2 PL c | Category 4 PL e; SIL3 |
| **IP Rating** | IP65 | IP65, IP67, IP69 | IP65 | | IP54, IP65 | IP65 | IP65 | IP65 |
| **Dimensions W x D (mm)** | 38 x 38 | 36 x 45 | 36 x 45 | | 28 x 26 | 27 x 22 | 25 x 32 | 52 x 56.9 |
| **Resolution (mm)** | 30 | 14, 23, 40 | 14 | 30 | 14, 25 | 14, 24 | 30 | 300, 400, 500 |
| **Max Sensing Range (m)** | 12 | 12 | 6 | 18 | Basic: 4<br>Standard: 7 | 2 | 15 | Standard: 30<br>Long Distance: 60 |
| **Defined Area (mm)** | 300 to 1800 | 280 to 2380 | 150 to 1800 | 150 to 2400 | Basic: 270, 410, 550, 690<br>Standard: 270 to 1250 | 160, 240, 320 | 150 to 1800 | 500 to 1200 |
| **Increments (mm)** | 150 | 70 | 150 | | Standard: 140 | 80 | 150 | 2, 3, 4 Beams |
| **Functions** | | | | | | | | |
| **Hand Detection** | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| **Finger Detection** | | ✓ | ✓ | | ✓ | ✓ | | |
| **Body Detection** | | | | | | | | ✓ |
| **Cascade** | | SLLC | SLSC | | SLPC | | | |
| **Scan Codes** | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| **Fixed Blanking** | | ✓ | ✓ | | ✓ | | | |
| **Reduced Resolution** | | | ✓ | | ✓ | | | |
| **EDM** | | ✓ | ✓ | | ✓ | | ✓ | ✓ |
| **Reset** | | | ✓ | | ✓ | | ✓ | ✓ |
| **Integrated Muting** | | See page 18 | | | ✓ | | | ✓ |
| **LED on Top** | | Accessory | | | | | | ✓ |

# S4B Type 4 Heavy-Duty Light Curtains

Designed for a broad range of applications, the next generation of safety light curtains has essential features including remote indication for predictive maintenance.



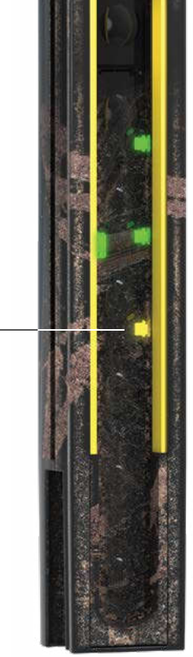

Window is recessed 4 mm for added protection

End-to-end sensing design (no blind zone)

## Prevent Downtime

Yellow indicates a weak signal due to a dirty lens.

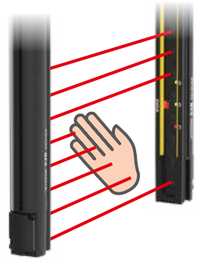
A weak beam strength output is sent via pin 5 to a PLC or HMI alerting operators to preventive maintenance needs.






### Eliminate Costly Repairs

Removable cordset with 5-pin M12 QD allows for cost effective replacement of only the damaged component



### Reliable Hand Detection

The S4B features a 30-millimeter resolution for reliable hand detection

## Simple Installation

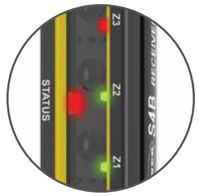
The S4B is designed and optimized for easy and intuitive installation, operation, and troubleshooting. Zone LEDs aid troubleshooting and help reduce downtime.




Rotating and locking brackets

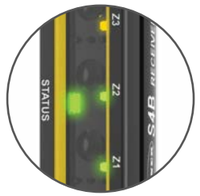


### Alignment Zone Indicators



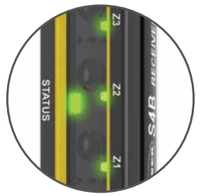

**Misaligned**

Red indicates a loss of signal due to a blocked beam or significant misalignment




**Weak**

Yellow indicates a weak signal due to a slight misalignment




**Aligned**

Green indicates a strong signal, proper alignment, and clear of obstruction

### Intuitive Setup and Swap-out

Select and save scan code setting without a PC for easy setup and swap-out



## 1. Select Emitter and Receiver

| Family | Feature Set | Device Type | Resolution | | Defined Area | | Termination |
|---|---|---|---|---|---|---|---|
| **S4** | **B** | **E** | **30** | – | **900** | – | **S** |
| | **B** = Basic | **E** = Emitter only<br>**R** = Receiver only | **30** = 30 mm | **300** = 300 mm<br>**450** = 450 mm<br>**600** = 600 mm<br>**750** = 750 mm | **900** = 900 mm<br>**1050** = 1050 mm<br>**1200** = 1200 mm<br>**1350** = 1350 mm | **1500** = 1500 mm<br>**1650** = 1650 mm<br>**1800** = 1800 mm | **S** = Emitter or Receiver only (S4B bracket(s) and S4B cordset(s) sold separately) |

## 2. Add S4B Brackets (required)



**S4BA-MBK-16**

- Side mount bracket
- Rotation: +/- 15°
- Includes 2 brackets and hardware
- Each bracket supports 900 mm of length

## 3. Add S4B Cordsets (required)

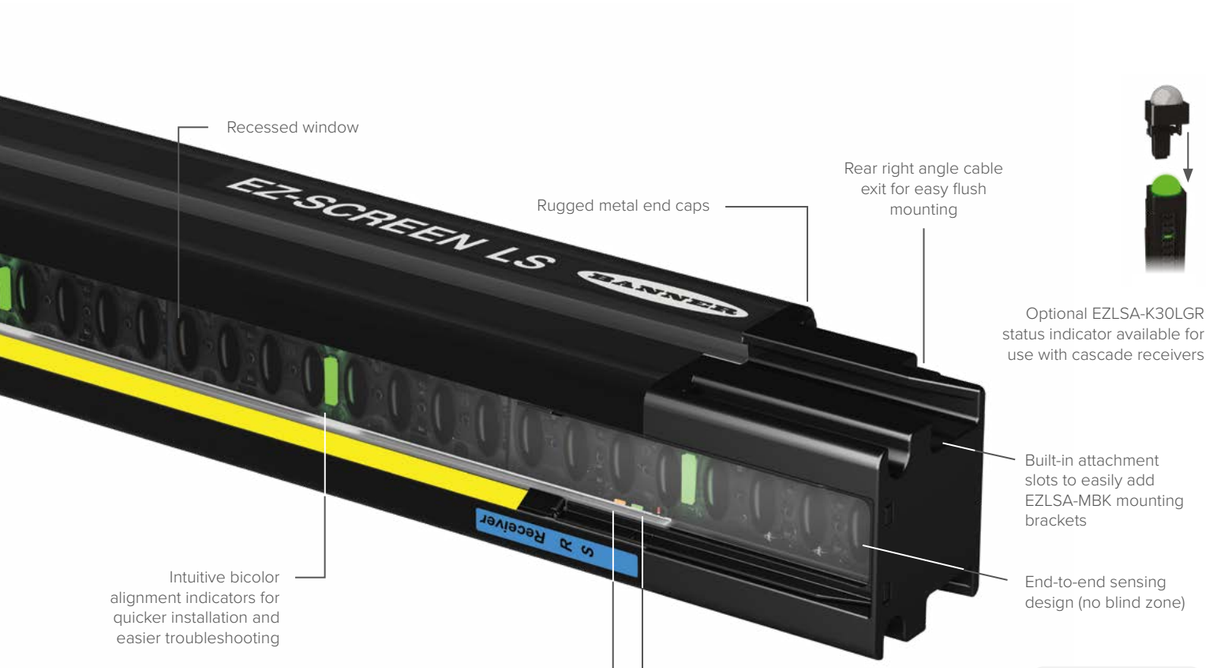


**DES4E-51D**

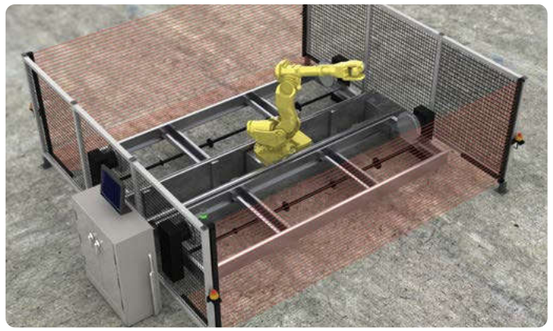
- S4B removable 5-pin M12 QD pigtail
- Includes one

# EZ-SCREEN LS Type 4 Heavy-Duty Light Curtains

The LS is a full-feature family of light curtains providing greater capabilities for cascading, blanking, EDM and more.




Learn more about our **cascade advantage**



Due to its robust design, the EZ-SCREEN LS is the perfect fit in large robotic cell applications that require sturdy safety devices and heavy duty enclosures.



EZ-SCREEN LS light curtains in hygienic tubular enclosures successfully protect operators from injury and remain hygienic for easy cleaning procedures.



## 1. Select Emitter, Receiver, or Pair

| Family | Cascade | System Type | Resolution | | Defined Area | | Termination |
|---|---|---|---|---|---|---|---|
| **SLL** | | **E** | **14** | – | **910** | – | **S** |

**Cascade**
- **Blank** = Standard
- **C** = Cascade

**System Type**
- **E** = Emitter only
- **R** = Receiver only
- **P** = Pair (Emitter and Receiver)

**Resolution**
- **14** = 14 mm
- **23** = 23 mm
- **40** = 40 mm

**Defined Area**
- **280** = 280 mm*
- **350** = 350 mm
- **420** = 420 mm
- **490** = 490 mm
- **560** = 560 mm
- **630** = 630 mm
- **700** = 700 mm
- **770** = 770 mm
- **840** = 840 mm
- **910** = 910 mm
- **980** = 980 mm
- **1050** = 1050 mm
- **1120** = 1120 mm
- **1190** = 1190 mm
- **1260** = 1260 mm
- **1330** = 1330 mm
- **1400** = 1400 mm
- **1470** = 1470 mm
- **1540** = 1540 mm
- **1610** = 1610 mm
- **1680** = 1680 mm
- **1750** = 1750 mm
- **1820** = 1820 mm
- **1960L** = 1960 mm**
- **2100L** = 2100 mm**
- **2380L** = 2380 mm**

*Not available in cascade models
**23 mm resolution, IP65, 10 m range

**Termination**
- **S** = emitter or receiver only (LS bracket(s) and LS cordset(s) ordered separately)
- **P5** = Emitter or receiver includes one LS M12 double ended cordset (5-pin) and LS brackets (-11 and -12)
- **P55** = Pair includes two LS M12 double ended cordsets (5-pin) and LS brackets (-11 and -12)
- **P8** = Emitter or receiver includes one LS M12 double ended cordset (8-pin) and LS brackets (-11 and -12)
- **P88** = Pair includes two LS M12 double ended cordsets (8-pin) and LS brackets (-11 and -12)
- **Blank** = Emitter, receiver or pair includes LS brackets (-11 and -12), LS cordset ordered separately

## 2. Add LS Brackets (for "-S" termination)



**EZLSA-MBK-11**
- End mount slotted steel bracket
- Rotation: 360° in 23° increments
- Includes two brackets
- Slotted mounting holes spaced 20 mm on-center



**EZLSA-MBK-12**
- Center mount steel bracket
- Rotation: +/- 15°
- Includes one bracket
- Use with EZLSA-MBK-11/-20 with a max of 980 mm unsupported



**EZLSA-MBK-16**
- Side mount die-cast bracket
- Rotation: +15° and -20°
- Includes one bracket
- Use one or multiple with a max of 980 mm unsupported



**EZLSA-MBK-20**
- End mount universal steel bracket
- Rotation: 360° in 23° increments
- Includes two brackets
- Universal mounting slots

## 3. Add LS Cordsets (for "-S" or "Blank" termination)



**LS-Custom to M12 Double Ended**

**DELSE-51D (5-Pin)**
0.3 m (1')
**DELSE-81D (8-Pin)**
0.3 m (1')



**Single Ended LS-Custom to Flying Leads**

**RDLS-515D (5-Pin)**
4.6 m (15')
**RDLS-815D (8-Pin)**
4.6 m (15')
**RDLS-825D (8-Pin)**
8 m (26')
**RDLS-850D (8-Pin)**
15.3 m (50')



**Double-Ended RD to RD Cordsets for Cascade Systems**

**DELS-111E**
0.3 m (1')
**DELS-113E**
1 m (3.3')
**DELS-1115E**
4.6 m (15.1')

## IP69 Hygenic

| Family | | System Type | Resolution | | Defined Area | | Termination |
|---|---|---|---|---|---|---|---|
| **EZLSA-HTE** | – | **R** | **23** | – | **910** | – | |



**E** = Emitter
**R** = Receiver

**23** = 23 mm

**280** = 280 mm*
**350** = 350 mm
**420** = 420 mm
**490** = 490 mm
**560** = 560 mm
**630** = 630 mm
**700** = 700 mm
**770** = 770 mm
**840** = 840 mm
**910** = 910 mm
**980** = 980 mm
**1050** = 1050 mm

*Not available with remote fixed blanking option

**Blank** = 7.6 m, 8-wire high durometer PVC cordset
**F** = Remote Fixed Blanking Receiver model with additional 7.6 m cordset for blanking configuration

## Brackets



**EZLSA-MBK-HTE-1**

- Stamped stainless steel bracket
- 360° rotation for IP69 enclosure models
- Two brackets per optional kit



**EZLSA-MBK-HTE-2**

- Hygienic stainless steel bracket
- 360° rotation for IP69 enclosure models
- Two brackets per optional kit

## Mute Arm Kits

Create a turn-key muting solution for your EZ-SCREEN LS Safety Light Curtain

- With a 300 mm (1 ft) PVC cable with a 8-pin M12 male quick disconnect
- **Needs EZ-SCREEN LS Hardware Adaptor Kit EZLSA-MCB-HW**

### L-Configuration



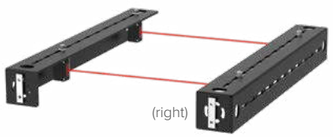

**SGSA-ML-L-LPQ20**
Includes 2 mute arms, 2 SGSA-Q20PLPQ5 mute sensors, and 2 retroreflectors

### T-Configuration



**SGSA-MT-LPQ20**
Includes 4 mute arms, 4 SGSA-Q20PLPQ5 mute sensors, and 4 retroreflectors

### X-Configuration

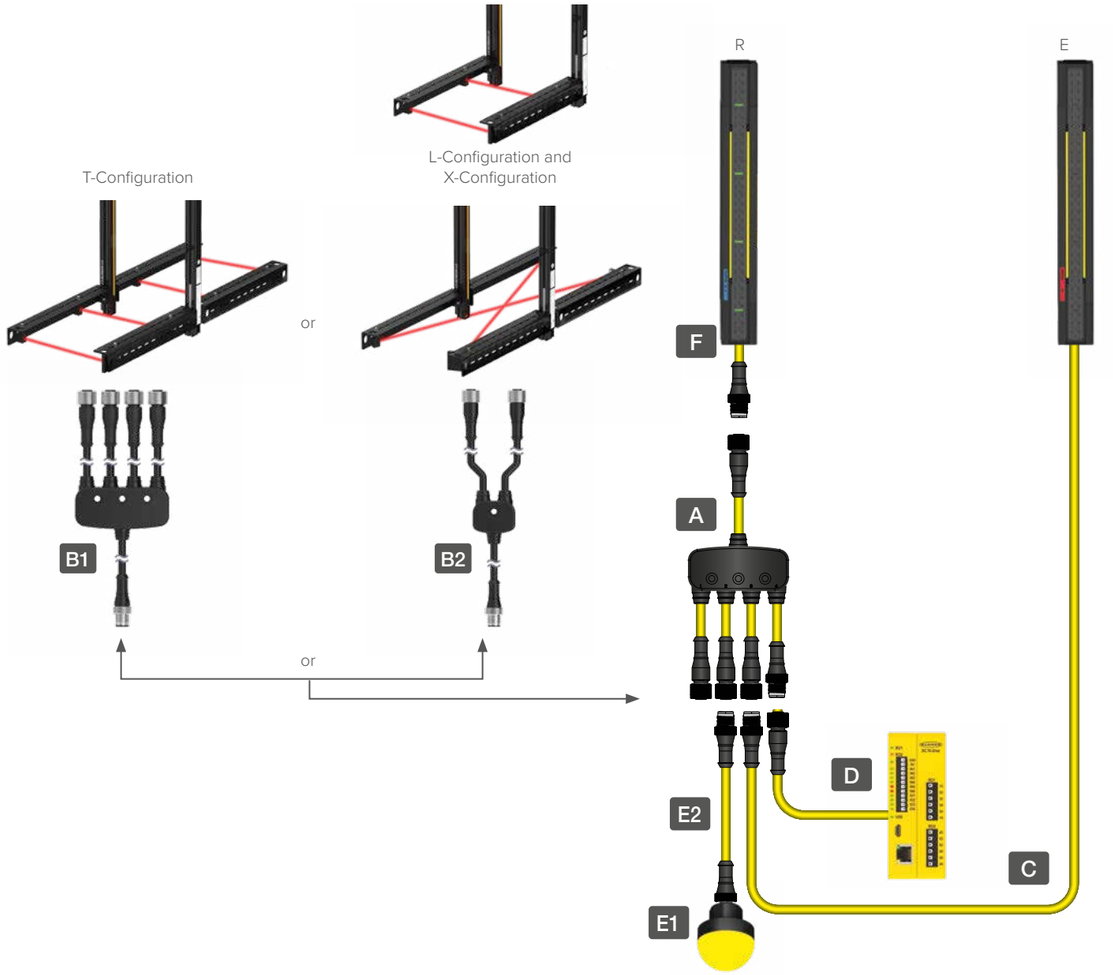



**SGSA-ML-R-LPQ20**
Includes 2 mute arms, 2 SGSA-Q20PLPQ5 mute sensors, and 2 retroreflectors



**SGSA-MX-LPQ20**
Includes 4 mute arms, 2 SGSA-Q20PLPQ5 mute sensors, and 2 retroreflectors

## Muting System Diagram




### Connection Cables

| | |
|---|---|
| **A** | **CSM4-M1281M1251M1281**<br>LS muting connection cable |
| **B** | SGS mute arm kit connection cable (select one)<br>B1: T-Muting: **CSA4-M1251M1251M1251M1251**<br>B2: L-Muting or X-Muting: **CSA-M1241M1241** |
| **C** | **DEE2R-8xxD**<br>LS emitter connection cable (xx is the length in feet) |
| **D** | **QDEG-12xxE**<br>Safety controller connection cable (xx is the length in feet) |
| **F** | **DELSE-81D (8-Pin)**<br>LS receiver connection cable (M12) |

### Mute Lights and Cables

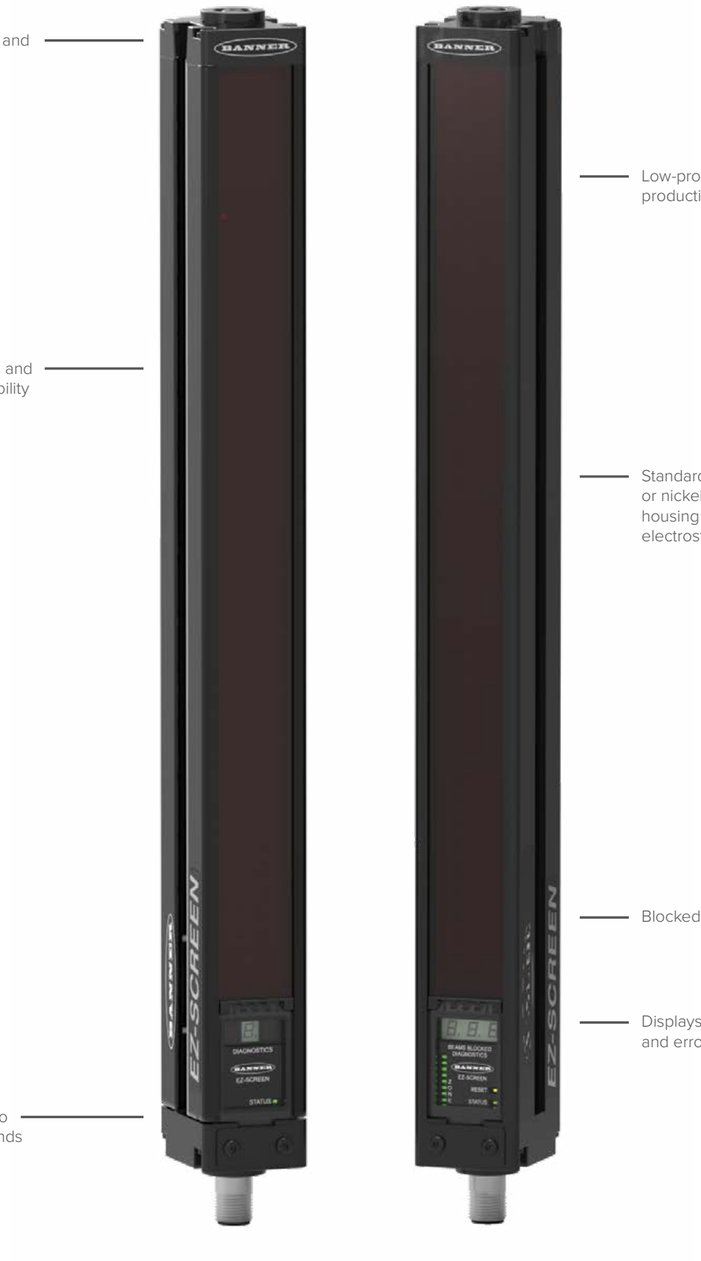
| | |
|---|---|
| **E1** | **TL50WQ, TL50YQ, K50LWXXPQ, K50LYXXPQ**<br>Mute lights (xx is the length in feet) |
| **E2** | **DEE2R-5xx**<br>Mute light cable (xx is the length in feet) |

### Interface options

Interface Modules (see page 52)

# EZ-SCREEN 14/30 Type 4 Light Curtains

Banner's traditional light curtain, the EZ-Screen 14/30 provides the longest sensing range, reduced resolution, and includes trip or latch/reset functionality.




Durable aluminum housing and metal end caps

Offers optional lens shields and enclosures for added durability

Low-profile compact package for smaller production machines

Standard nickel-plated housing or nickel-plated ESD-safe housing for protection against electrostatic discharges

Blocked beam zone indicators

Displays operating status, configuration and error codes

Offers optional cascading to create a system that responds to a single stop command

Learn more about our **cascade advantage**

## 1. Select Emitter and Receiver

| Family | Cascade | System Type | Resolution | | Defined Area | Finish | Termination |
|---|---|---|---|---|---|---|---|
| SLS | C | P | 14 | – | 150 | | Q88 |

**C** = Cascade
**Blank** = No cascading

**E** = Emitter
**R** = Receiver
**P** = Pair

**14** = 14 mm
**30** = 30 mm

**150** = 150 mm*
**300** = 300 mm
**450** = 450 mm
**600** = 600 mm
**750** = 750 mm
**900** = 900 mm
**1050** = 1050 mm
**1200** = 1200 mm
**1350** = 1350 mm
**1500** = 1500 mm
**1650** = 1650 mm
**1800** = 1800 mm
**1950** = 1950 mm**
**2100** = 2100 mm**
**2250** = 2250 mm**
**2400** = 2400 mm**

*Not available in cascade models
**Only available in 30 mm resolution

**Blank** = Yellow powder coat
**N** = Nickel-plated ESD
(ESD-safe models are not available with pigtail QD)
**A** = Clear anodized aluminium

**Q8** = 8-pin M12 QD (individual Emitter or Receiver models)
**P8** = 8-pin M12 pigtail QD (individual Emitter or Receiver models)
**Q88** = For Pair – Emitter with 8-pin M12 QD, Receiver with 8-pin QD
**P88** = For Pair – Emitter with 8-pin M12 pigtail QD, Receiver with 8-pin M12 pigtail QD

## 2. Add Brackets



**EZA-MBK-11**

- Standard mounting L-bracket



**EZA-MBK-12**

- Center mounting bracket



**EZA-MBK-20**

- Retrofit bracket for mounting to engineered/slotted aluminum framing

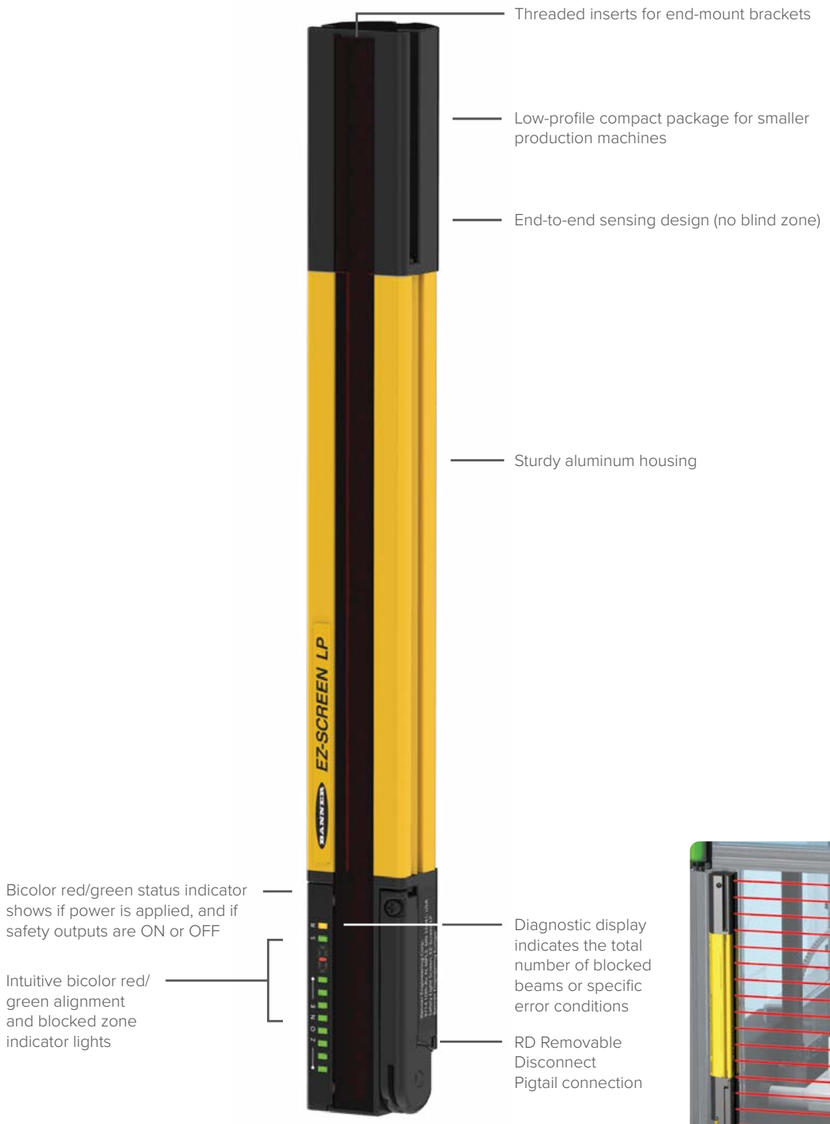


**EZA-MBK-21**

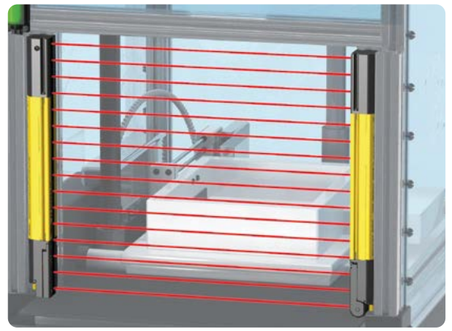
- Mounting bracket system for L configuration of two cascaded light screens
- One EZA-MBK-21 kit contains brackets for one side of an L-mounting configuration

# EZ-SCREEN LP Type 4 Compact Light Curtains

Banner's compact full-feature family of light curtains providing capabilities for cascading, blanking, integral muting, latch/reset, EDM, and more.




Learn more about our
**cascade advantage**



The EZ-SCREEN LP safety light screen is compact and mounts in tight spaces with its continual end-to-end sensing that leaves no gaps.

## 1. Select Emitter and Receiver

### EZ Screen LP

| Family | Cascade | System Type | Resolution | | Defined Area | Termination |
|---|---|---|---|---|---|---|
| **SLP** | **C** | **P** | **14** | — | **410** | **P88** |

**C** = Cascade*
**Blank** = Standard
**VA** = LP Basic

**P** = Pair (Emitter and Receiver)
**E** = Emitter only
**R** = Receiver only

**14** = 14 mm
**25** = 25 mm

**270** = 270 mm**
**410** = 410 mm
**550** = 550 mm
**690** = 690 mm
**830** = 830 mm†
**970** = 970 mm†
**1110** = 1110 mm†
**1250** = 1250 mm†

Note: LP Basic contains individual emitter and/or receiver only. Brackets and cordset ordered separately

**P8** = 300 mm 8-Pin M12 pigtail QD (individual Emitter or Receiver models)
**P88** = 300 mm 8-Pin M12 pigtail QD (on BOTH Emitter and Receiver models)
**Blank** = no pigtail, RD connection (for RDLP-8..D cordset)

*8-pin connection required for cascade models and to enable EDM, Aux Output and Reset features
**Not available in cascade models
†Not available in LP Basic models

### EZ Screen LP with Muting

| Family | Resolution | | Defined Area | Finish | Termination |
|---|---|---|---|---|---|
| **SLPMP** | **14** | — | **410** | | |

**SLPE** = Emitter
**SLPMR** = Receiver
**SLPMP** = Pair

**14** = 14 mm
**25** = 25 mm

**410** = 410 mm
**550** = 550 mm
**690** = 690 mm
**830** = 830 mm
**970** = 970 mm
**1110** = 1110 mm
**1250** = 1250 mm

**Blank** = Yellow powder coat
**N** = Nickel-plated ESD
**A** = Clear anodized aluminium

**Blank** = Integral Removable Disconnect
**P8** = 8-pin pigtail QD (SLPE)
**P12** = 12-pin pigtail QD (SLPMR)
**P128** = For SLPMP (Pair)
Emitter with 8-pin M12 pigtail QD
Receiver with 12-pin M12 pigtail QD

## 2. Add Brackets



**LPA-MBK-10**

- End mount bracket
- Rotation: 40°
- Includes 2 brackets and hardware
- 14 ga. steel, black zinc-plated



**LPA-MBK-11**

- Standard end mount bracket
- Rotation: 360°
- Includes 2 brackets and hardware
- 14 ga. steel, black zinc-plated



**LPA-MBK-12**

- Standard side mount bracket
- Rotation: +10° and -30°
- Includes 1 bracket and hardware
- 14 ga. steel, black zinc-plated



**LPA-MBK-16**

- Side mount bracket
- Rotation: +15° and -20°
- Includes 1 bracket and hardware
- Black zinc die-cast



**LPA-MBK-21**

- Pivoting cascade mounting bracket
- Includes 2 brackets and hardware
- 14 ga. steel, black zinc-plated

## 3. Add Cordsets

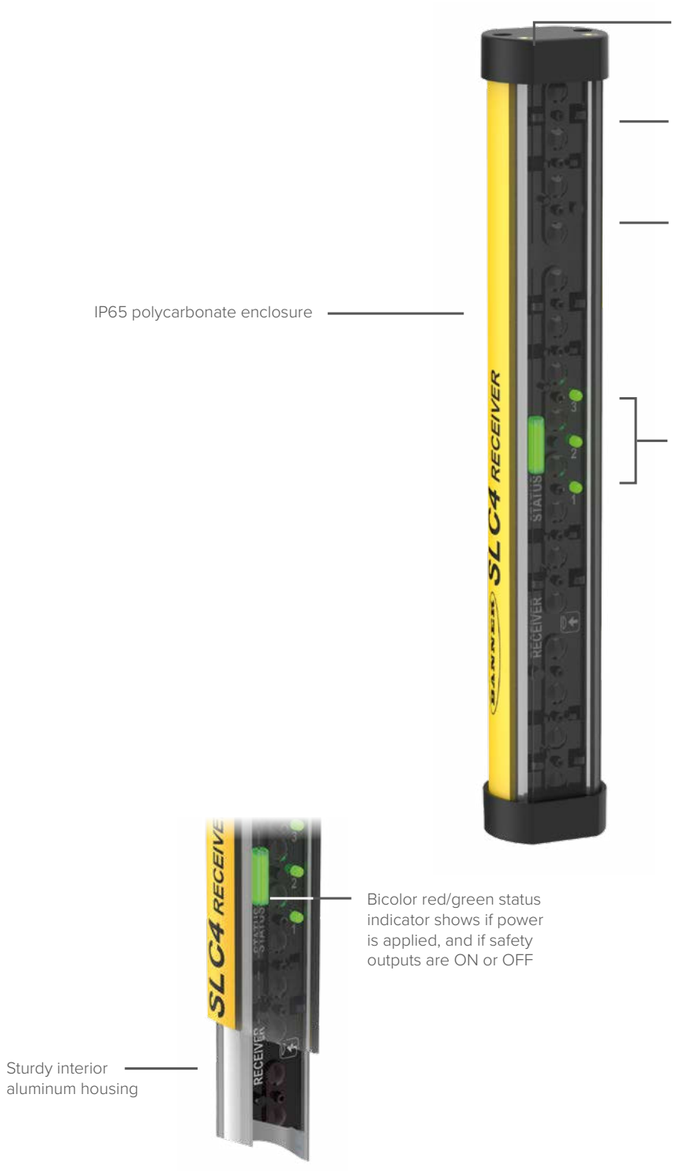


**LP-Custom to M12 Male QD**

**DELPE-51D (5-pin)**
0.3 m (1 ft)
**DELPE-81D (8-pin)**
0.3 m (1 ft)

# SLC4 Type 4 Ultra Compact Light Curtains

Banner's shortest, most compact light curtain is built with today's essential features including 14 mm and 24 mm resolution, zone/alignment indicators, and more.




## 1. Select Emitter and Receiver

| Family | System Type | Resolution | | Defined Area | Termination |
|---|---|---|---|---|---|
| SLC4 | P | 14 | – | 160 | P44 |

- **P** = Pair (Emitter and Receiver)
  **E** = Emitter only
  **R** = Receiver only
- **14** = 14 mm
  **24** = 24 mm
- **160** = 160 mm
  **240** = 240 mm
  **320** = 320 mm
- **P4** = 300 mm 4-Pin M12 pigtail QD (individual Emitter or Receiver models)
  **P44** = 300 mm 4-Pin M12 pigtail QD (Pair)

## 2. Add Brackets



**SLC4A-MBK-10**

- End mount bracket
- Rotation: +/- 20°
- Includes 4 brackets and hardware
- 14 ga. steel, black zinc-plated



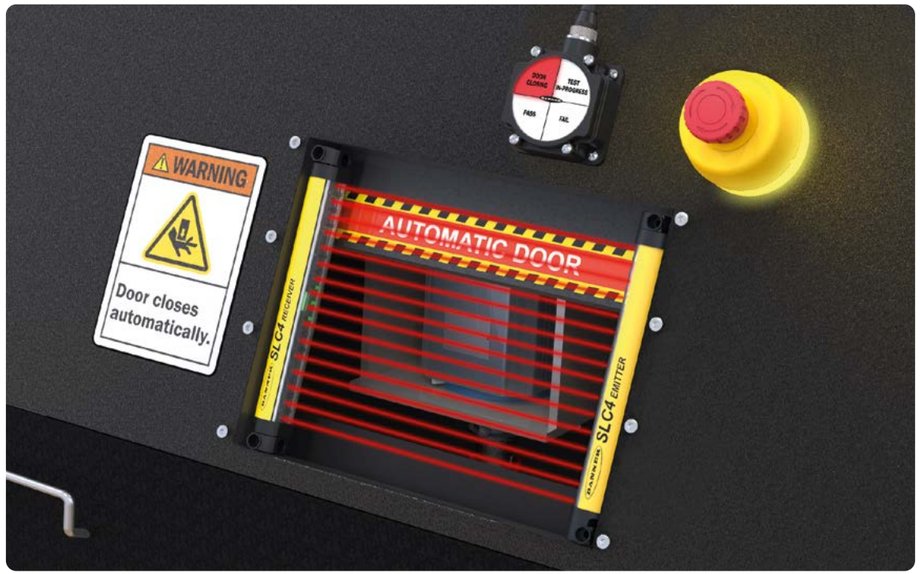
**SLC4A-MBK-11**

- End mount bracket
- Rotation: Fixed
- Includes 4 brackets and hardware
- Glass-filled polycarbonate



**SLC4A-MBK-12**

- Side mount bracket
- Rotation: +/- 15°
- Includes 2 brackets
- Glass-filled polycarbonate




SLC4 are Type 4 safety light curtains specifically designed to safeguard smaller points of operation and access on compact machines.

# EZ-SCREEN LS2 Type 2 Light Curtains

Designed for lower-risk applications such as bump or bruise, knock-down, trapping but not crushing, or minor cuts and abrasions.

Economical and compact




Features simple, two-piece integrated system with no control box

Available in trip (auto reset) or latch (manual reset) models

## 1. Select Emitter and Receiver

| Family | System Type | Resolution | | Defined Area | | Termination |
|---|---|---|---|---|---|---|
| **LS2** | **TP** | **30** | — | **150** | | **Q88** |
| | **E** = Emitter | **30** = 30 mm | | **150** = 150 mm | **1050** = 1050 mm | **Q8** = 8-pin QD (individual Emitter or Receiver models) |
| | **TR** = Trip Receiver | | | **300** = 300 mm | **1200** = 1200 mm | **Q88** = For pair: Emitter with 8-pin M12 QD, Receiver with 8-pin M12 QD |
| | **TP** = Trip Pair | | | **450** = 450 mm | **1350** = 1350 mm | |
| | **LR** = Latch Receiver | | | **600** = 600 mm | **1500** = 1500 mm | |
| | **LP** = Latch Pair | | | **750** = 750 mm | **1650** = 1650 mm | |
| | | | | **900** = 900 mm | **1800** = 1800 mm | |

## 2. Add Brackets



**USMB-5**

- Retrofit mounting bracket
- 2.3 mm thickness, black zinc-plated, chromate dip finish
- Mounting hardware included: 1 kit required per emitter or receiver



**USMB-6**

- Universal mounting bracket kit
- 2.3 mm thickness, black zinc-plated, chromate dip finish
- Mounting hardware included: 1 kit required per emitter or receiver



**USMB-8**

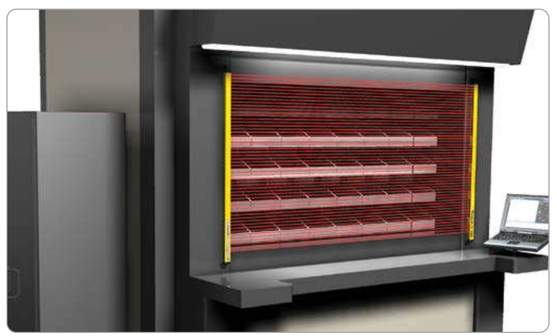
- Low profile mounting plate for 90°sensor direction
- Black anodized aluminum
- Uses two M4 screws (user supplied) for through-hole mounting
- 1 kit required per emitter or receiver

## 3. Add Cordsets

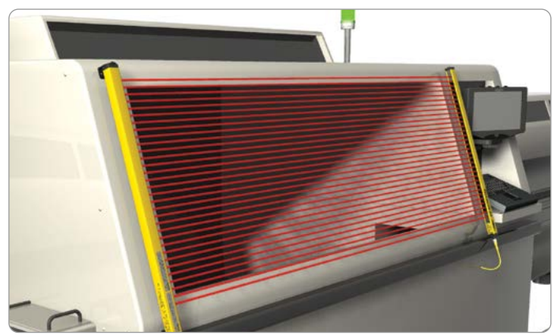


**8-Pin M12 with Flying Leads**

**QDE-815D**
4.5 m (15')
**QDE-825D**
7.6 m (25')
**QDE-850D**
15.2 m (50')



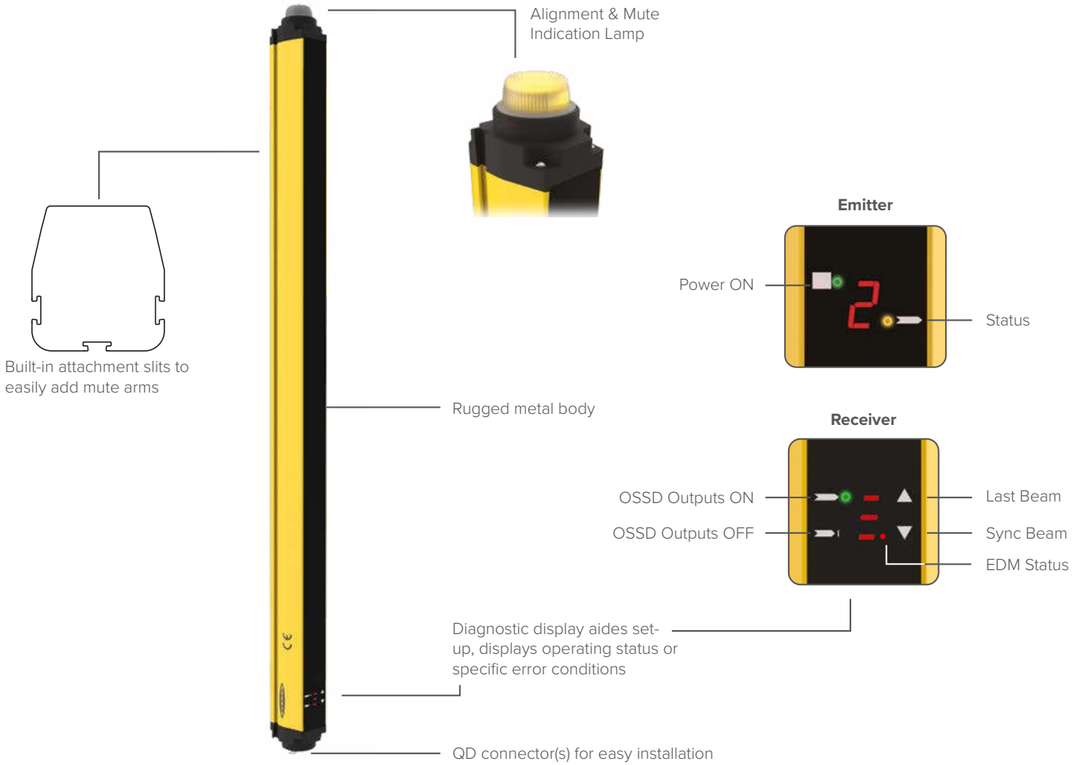
The Type 2 EZ-SCREEN safety light screen protects hands and fingers from being bumped, bruised, or pinched by the moving parts of a carousel.

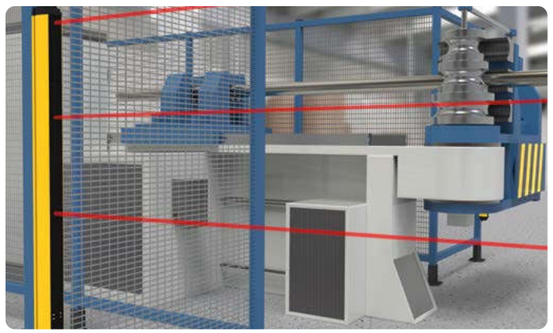


The Type 2 EZ-SCREEN safety light screen guards the opening to a chip shooter, which has moving parts that can cause painful but usually temporary injuries.

# SGS Type 4 Safety Light Grids

Two to four beam Type 4 safety light grids protect personnel from injury and machines from damage by guarding access, areas, and perimeters. Able to detect a body in a cost-effective and heavy-duty safety light curtain package.



SGS Safety Grid Systems, with two, three, or four beams, are used to monitor the perimeter of the work area.

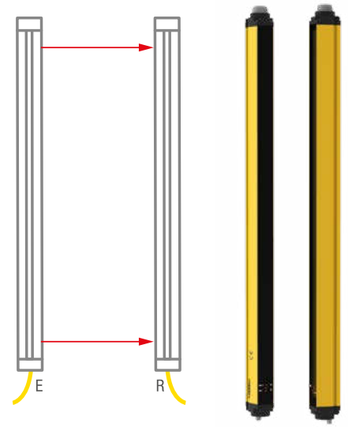


SGS Safety Grid Systems are available in Emitter/Receiver models capable of safeguarding over very long distances and in easy-to-deploy Active/Passive models.



## SGS Emitter/Reveiver

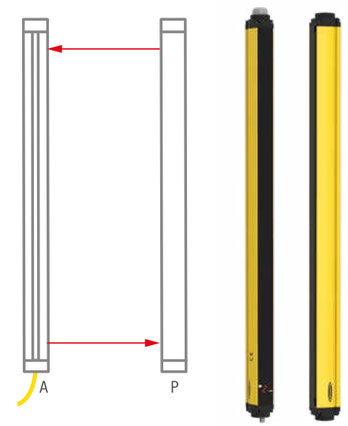
- When compared to higher resolution light screens, a lower cost option for body detection applications
- Available with integral muting
- Long range, up to 60 m




| Type | Range (m) | Integral Muting | Protective Height (mm) | Models |
|---|---|---|---|---|
| Emitter & Receiver | 6 to 60 | No | 500 (2 beams) | **SGSXP2-500Q88** |
| | | | 800 (3 beams) | **SGSXP3-400Q88** |
| | | | 900 (4 beams) | **SGSXP4-300Q88** |
| | | | 1200 (4 beams) | **SGSXP4-400Q88** |
| | 0.5 to 30 | No | 500 (2 beams) | **SGSSP2-500Q88** |
| | | | 800 (3 beams) | **SGSSP3-400Q88** |
| | | | 900 (4 beams) | **SGSSP4-300Q88** |
| | | | 1200 (4 beams) | **SGSSP4-400Q88** |
| | 0.5 to 30 | Yes | 500 (2 beams) | **SGSMP2-500Q128** |
| | | | 800 (3 beams) | **SGSMP3-400Q128** |
| | | | 900 (4 beams) | **SGSMP4-300Q128** |
| | | | 1200 (4 beams) | **SGSMP4-400Q128** |

## SGS Active/Passive

- Active transceiver contains emitter and receiver
- Reduces overall wiring costs
- Available with integral muting
- Up to 8 m range




| Type | Range (m) | Integral Muting | Protective Height (mm) | Models |
|---|---|---|---|---|
| Active Transceiver | 0.5 to 8 | No | 500 (2 beams) | **SGSSA2-500Q8** |
| | | | 800 (3 beams) | **SGSSA3-400Q8** |
| | 0.5 to 6.5 | | 900 (4 beams) | **SGSSA4-300Q8** |
| | 0.5 to 8 | | 1200 (4 beams) | **SGSSA4-400Q8** |
| | 0.5 to 8 | Yes | 500 (2 beams) | **SGSMA2-500Q12** |
| | | | 800 (3 beams) | **SGSMA3-400Q12** |
| | 0.5 to 6.5 | | 900 (4 beams) | **SGSMA4-300Q12** |
| | 0.5 to 8 | | 1200 (4 beams) | **SGSMA4-400Q12** |

**Passive Mirror**

| Type | Range (m) | Protective Height (mm) | Models |
|---|---|---|---|
| Passive Mirror Assembly | Pair with Active Transceivers with matching beams and protective heights | 500 (2 beams) | **SGSB2-500** |
| | | 800 (3 beams) | **SGSB3-400** |
| | | 900 (4 beams) | **SGSB4-300** |
| | | 1200 (4 beams) | **SGSB4-400** |

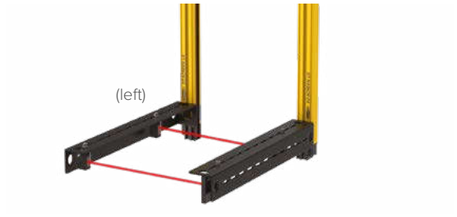
# SGS Safety Light Grids Continued

## Mute Arm Kits

Preassembled (with mounting hardware) for plug-and-play connection to the SGS grid and LS Safety Light Curtains

- Wiring connection block or cable accessories available
- Adjusts easily for line changes
- Hardware kit to attach mute arms to LS curtains, EZLSA-MCB-HW, ordered separately from mute arm kits

### L-Configuration




**SGSA-ML-L-LPQ20**
Includes 2 mute arms, 2 SGSA-Q20PLPQ5 mute sensors, and 2 retroreflectors

### T-Configuration



**SGSA-MT-LPQ20**
Includes 4 mute arms, 4 SGSA-Q20PLPQ5 mute sensors, and 4 retroreflectors

### X-Configuration




**SGSA-ML-R-LPQ20**
Includes 2 mute arms, 2 SGSA-Q20PLPQ5 mute sensors, and 2 retroreflectors



**SGSA-MX-LPQ20**
Includes 4 mute arms, 2 SGSA-Q20PLPQ5 mute sensors, and 2 retroreflectors



Integral muting models have muting technology built into the device eliminating the need for an external muting controller. Preassembled muting arm kits are available in T, L and X configurations. The muting kits use premounted hardware and Q20 retroreflective sensors and reflectors.

### Benefits of Muting

- Maintain high safety standards while allowing for a predetermined object to break a beam
- Limit downtime by not unnecessarily shutting down a conveyor or robot cell

### Applications

- Assembly and packaging machines
- Automated production equipment
- Robotic work cells
- Automated warehouses
- Palletizers



## Mute Connection Options

| Description | Models |
|---|---|
| Connection box for X, L or T mute arm kits | **SGSA-MCB** |
| Connection cable for X and L mute arm kits | **SGSA-MCS-2** |
| Connection cable for T mute arm kits | **SGSA-MCS-4** |
| Optional hardware kit for mounting mute connection box, or mute connection cable to the t-slot of SGS Receiver or Active Unit | **SGSA-MCB-HW** |

## Stands and Corner Mirrors



**SGSA-S Series Enclosures**

| Fits SGS Models | # of Windows | Enclosure Height | Distance from Floor to Bottom Window | Distance between Beams | Enclosure Models |
|---|---|---|---|---|---|
| SGS..4-300Q.. | 4 | 1543 mm (60.75") | 300 mm (11.8") | 300 mm (11.8") | **SGSA4-S300** |
| | | | | | **SGSA4-S300-M** |
| SGS..3-400Q.. | 3 | 1238 mm (48.78") | 300 mm (11.8") | 400 mm (15.8") | **SGSA3-S400** |
| | | | | | **SGSA3-S400-M** |
| SGS..4-400Q.. | 4 | 1618 mm (63.69") | 300 mm (11.8") | 400 mm (15.8") | **SGSA4-S400** |
| | | | | | **SGSA4-S400-M** |
| SGS..2-500Q.. | 2 | 1035 mm (40.75") | 400 mm (15.8") | 500 mm (19.7") | **SGSA2-S500** |
| | | | | | **SGSA2-S500-M** |



**SSM Series Corner Mirrors**

| Fits SGS Models | Reflective Area | Mounting Area | Mirror Height | Mirror Models |
|---|---|---|---|---|
| SGS..2-500.. | 550 mm (21.7") | 661 mm (26.0") | 628 mm (24.7") | **SSM-550** |
| SGS..3-400.. | 825 mm (32.5") | 936 mm (36.9") | 903 mm (35.6") | **SSM-825** |
| SGS..4-300.. | 975 mm (38.4") | 1086 mm (42.8") | 1053 mm (41.5") | **SSM-975** |
| SGS..4-400.. | 1275 mm (50.2") | 1386 mm (54.6") | 1353 mm (53.3") | **SSM-1275** |



**MSA Series Stands**

| Pole Height | Usable Stand Height | Stand Models |
|---|---|---|
| 1676 mm (66") | 1550 mm (61") | **MSA-S66-1** |
| 2134 mm (84") | 2007 mm (79") | **MSA-A84-1** |
| 2667 mm (105") | 2667 mm (100") | **MSA-S105-1** |

## Cables



**8-Pin M12 with Flying Leads**

**QDE-815D**
4.5 m (15')
**QDE-825D**
7.6 m (25')
**QDE-850D**
15.2 m (50')



**12-Pin M12 with Flying Leads**

**QDE-1215E**
4.5 m (15')
**QDE-1225E**
7.6 m (25')
**QDE-1250E**
15.2 m (50')

## Brackets



**SA-MBK-10-4**

End-mount bracket

# Choosing a Banner Safety Scanner



Start with
the SX5-B6

- 275° field of view
- 5.5 meter range
- Integral muting

If the following are needed:
- 2 OSSD pairs
- Master/remote
- 10 zone sets



select SX5-M10

If the following is needed:
- 3 OSSD pairs
- 70 zone sets
- Muting/bypass option



select SX5-M70

If the following is needed:
- Encoder inputs



select SX5-ME70

| |  SX5-B6 |  SX5-M10 |
|---|---|---|
| **Description** | Stand Alone | Master |
| **OSSD Pairs** | 1 | 2 |
| **Removable Memory** | | ✓ |
| **Replaceable Window** | ✓ | ✓ |
| **Zone Sets** | 6 | 10 |

|  SX5-M70 |  SX5-ME70 |  SX5-R |
|---|---|---|
| Master | Master | Remote |
| 3 | 3 | |
| ✓ | ✓ | ✓ |
| ✓ | ✓ | ✓ |
| 70 | 70 | Master |

# Safety Scanner Selection Guide

| |  SX5-B6 |  SX5-M10 |  SX5-M70 |  SX5-ME70 |  SX5-R |
|---|---|---|---|---|---|
| | p. 36 | p. 36 | p. 36 | p. 36 | p. 36 |
| **Dimensions W x D x H (mm)** | 102 x 112 x 152 | 102 x 112 x 152 | 102 x 112 x 152 | 102 x 112 x 152 | 102 x 112 x 152 |
| **Presence Detection** | 50/70 mm | 50/70 mm | 50/70 mm | 50/70 mm | 50/70 mm |
| **Body Detection** | 70/150 mm | 70/150 mm | 70/150 mm | 70/150 mm | 70/150 mm |
| **Hand Detection** | 30/40 mm | 30/40 mm | 30/40 mm | 30/40 mm | 30/40 mm |
| **Range** (depending on resolution) | 30 mm = 2.5 m<br>40 mm = 3 m<br>50 mm = 4 m<br>70/150 mm = 5.5 m | 30 mm = 2.5 m<br>40 mm = 3 m<br>50 mm = 4 m<br>70/150 mm = 5.5 m | 30 mm = 2.5 m<br>40 mm = 3 m<br>50 mm = 4 m<br>70/150 mm = 5.5 m | 30 mm = 2.5 m<br>40 mm = 3 m<br>50 mm = 4 m<br>70/150 mm = 5.5 m | 30 mm = 2.5 m<br>40 mm = 3 m<br>50 mm = 4 m<br>70/150 mm = 5.5 m |
| **Max. Zone Sets** (depending on configuration) | 6 | 10 | 70 | 70 | depending on master |
| **Master Remote** | | Master (up to 3 remotes) | Master (up to 3 remotes) | Master (up to 3 remotes) | Remote |
| **Removable Memory** | | SXA-RM-10 | SXA-RM-70 | SXA-RM-70 | |
| **Speed Monitoring** | | | | ✓ | |
| **Max. OSSD Outputs** (depending on configuration) | 1x 2 OSSD | 2x 2 OSSD | 3x 2 OSSD | 3x 2 OSSD | |
| **Inter Device Connection** | | 8-Pin M12 | 8-Pin M12 | 8-Pin M12 | 8-Pin M12 |
| **Integral Muting** | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Programmable Dust Filter** | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Measurement Data** | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Field-replaceable Window** | ✓ | ✓ | ✓ | ✓ | ✓ |

# Safety Scanner System

## Horizontal or vertical monitoring of both personnel and stationary or mobile systems

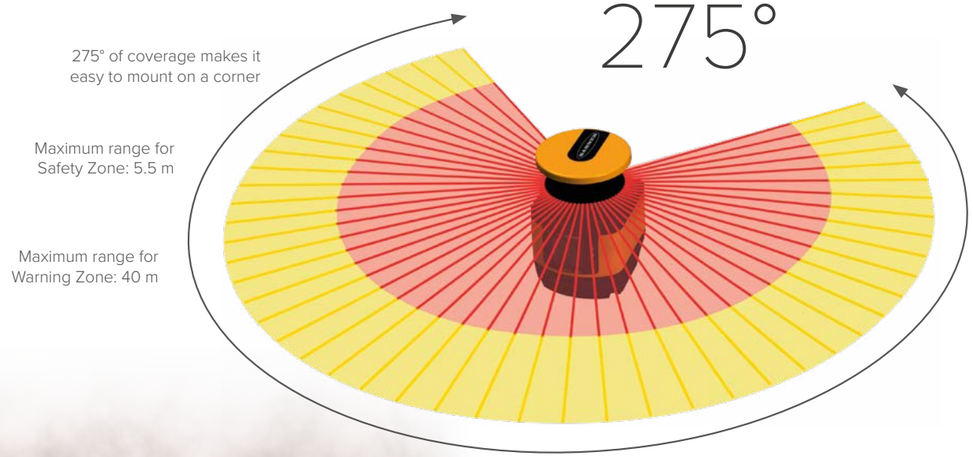
SX Series safety laser scanners protect personnel, equipment, and mobile systems by continuously scanning a user-defined area of up to 275° to create a two-dimensional protected zone.



SX5 software configuration allows zone switching for full, right-side and left-side safety protection during this forklift access application.

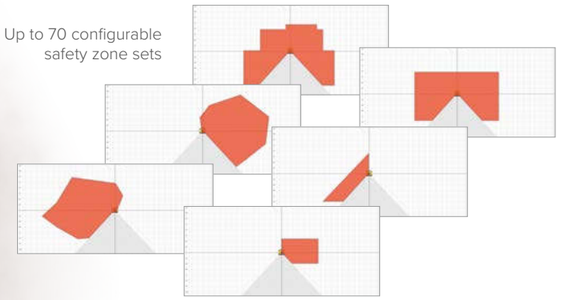


Software interface makes it easy to create custom safety and warning zones to safeguard large, complex, and irregularly shaped areas.



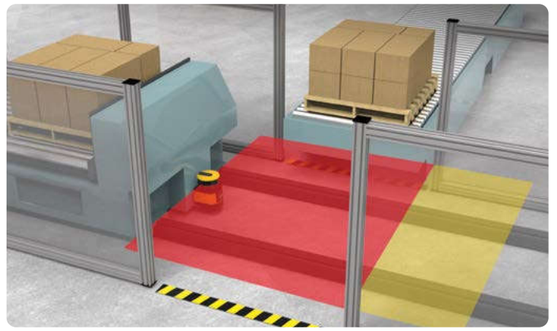



Light Immune and dust resistant – Best in class

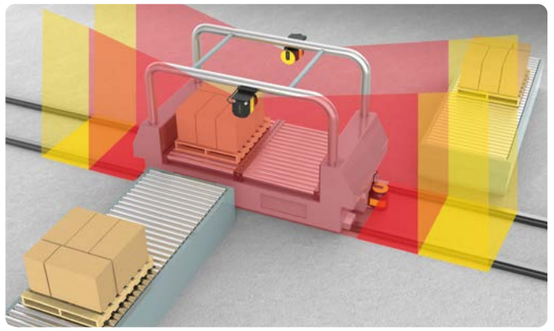



## Increased Machine Uptime

The SX5 has on-board LED indicators and a large multi-segment color display that provide at-a-glance system status information so users can quickly identify zone breaches and resolve issues with a minimal amount of equipment downtime.



Compact, one-piece safety device installs easily above and away from area hazards without requiring time-consuming alterations to area infrastructure.



An alert is triggered if an object enters the warning zone and equipment will come to a stop if the safety zone is breached.



# Safety Scanner System

## Removable memory for fast scanner replacement

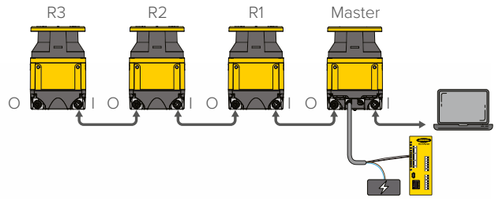
The system configuration is backed up in a removable memory unit. Install your replacement scanner fast and easy, without needing to reconfigure your system. The machine interface cables attach to this memory unit on the Master models.

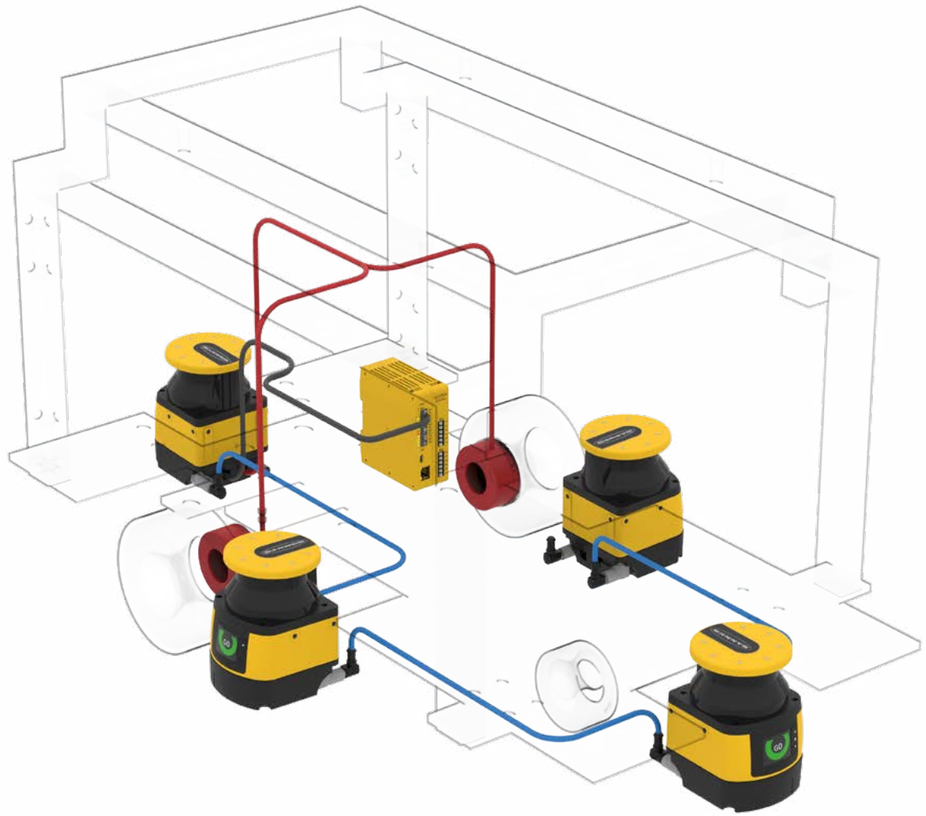


## Master and Remote connection reduces wiring

For applications that require monitoring multiple sides of an AGV, up to four scanners can be easily connected through an Ethernet-based safe communications bus, working as a single system.

Each remote unit is connected to the master by a single cable that provides them with power, and the memory of the entire system is stored in the master.

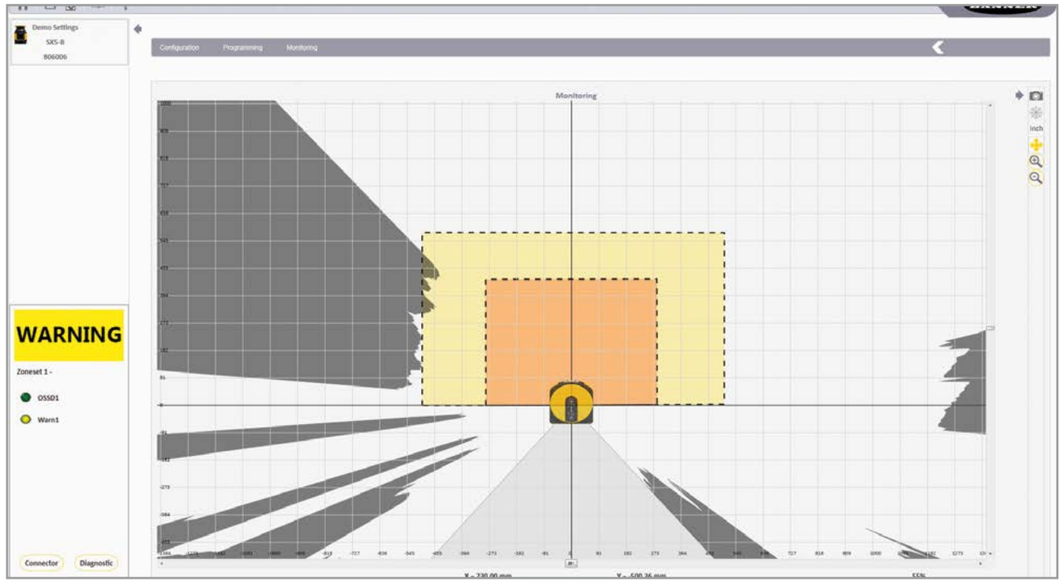


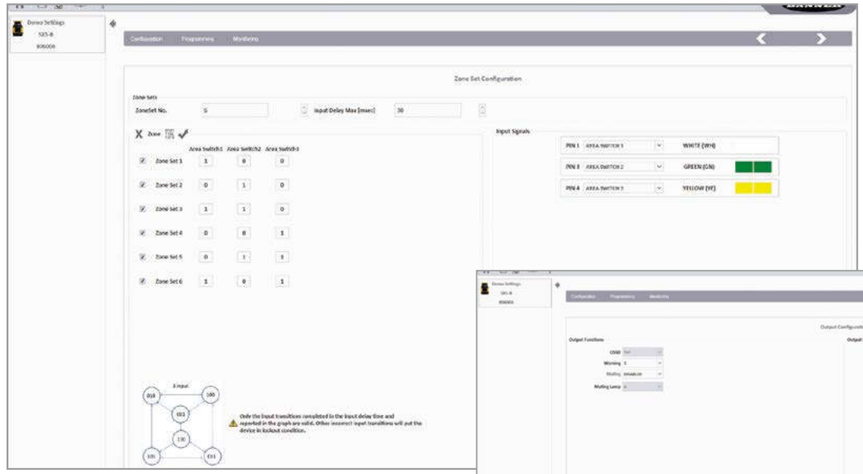



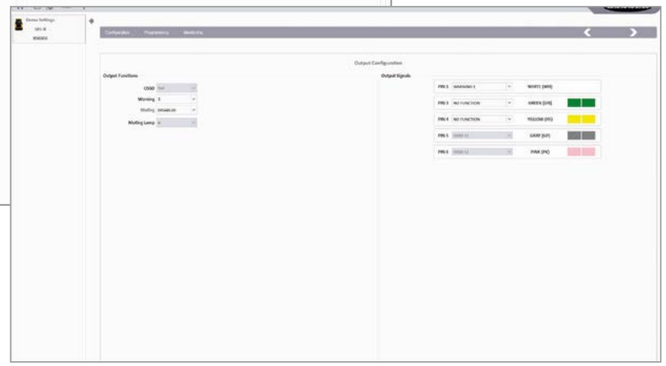
# Safety Scanner Software

## Simple setup for rapid deployment

The SX5 can be set up in just a few simple steps using Banner's free configuration software. This robust software features menu-driven tools that guide users through setup and make it easy to design custom safety and warning zones to accommodate existing infrastructure and meet the specific needs of any application.



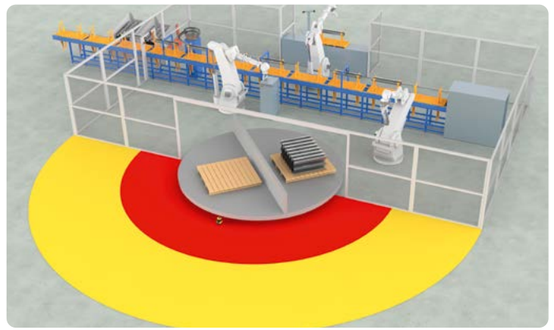



The software displays a graphic rendering of the monitored area and provides configuration and management tools, such as drop-down menus, function-specific worksheets, and more.

# Safety Scanner Fixed Applications

## Stationary area guarding

Stationary area guarding uses sensing fields such as safety or warning zones to continually sense an individual within a safeguarded area. Stationary area guarding can reduce or eliminate the possibility of a pass-through hazard that could result in an individual being exposed to unexpected machine startup or motion.



### Single-zone safeguarding

The safety scanner detects when a person approaches a hazard. When the person enters a warning zone, the hazardous motion is controlled safely. When the person enters the safety zone, the hazard is stopped.



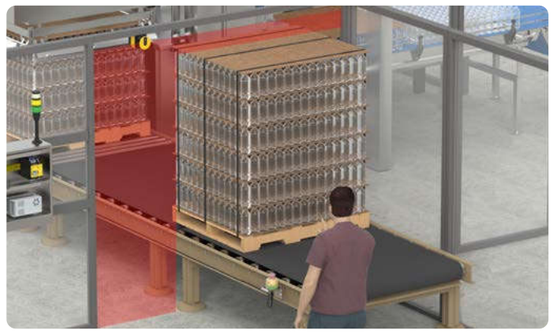

### Multi-zone safeguarding

Up to three safety zones can be monitored simultaneously and independently. This way, safety in the entire plant is optimized, ensuring increased productivity and improved ergonomics in the entire plant.



### Multi-zone safeguarding via master-remote

Manage multiple areas with master-remote architecture. Multiple safety zones stop different parts of the dangerous machine, without the need of an external controller.



### Safeguarding with dynamic and partial muting

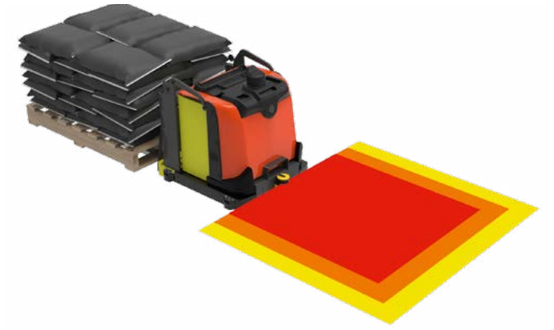
Muting sensors can be directly connected to the SX5, creating a tightly protected area around the muted object while muting is active. Each safety output can be configured with its own muting requirements.



# Safety Scanner Mobile Applications

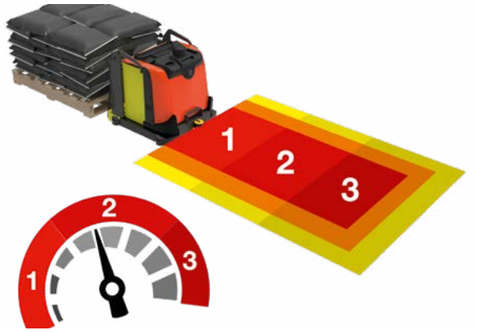
## Mobile area guarding

On mobile applications, the SX5 monitors the area directly ahead of the vehicle using both the warning and the safety zones. The vehicle slows down if something is detected in the warning zone and the vehicle stops when something is detected in the safety zone. If the speed increases or decreases, alternate zone sets can be used to adjust for varying stopping distances.



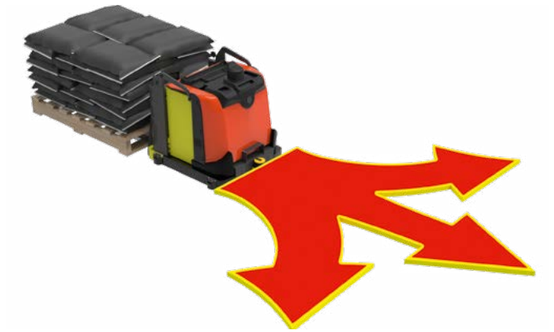
### Automated guided vehicle collision avoidance

Warning and safety zones can be used to alert operators, slow down the vehicle, or stop it. Up to 70 different zones can be set and activated per position, speed and movement of the vehicle.



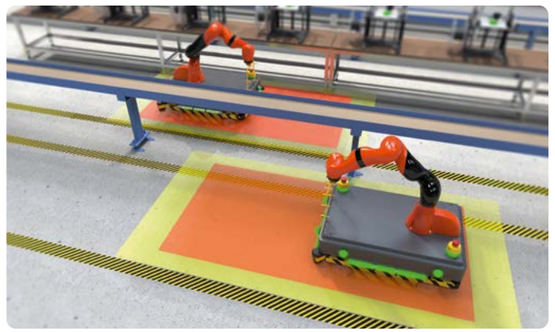

### Safe speed monitoring

Incremental encoders inputs can be directly read by the SX5 scanner in order to select the appropriate slow-down and stopping areas, based on the speed of the vehicle.



### Advanced measurement data for direct navigation

The SX5 has a direct transmission protocol over Ethernet. It can be used to read measurement data for vehicle navigation. Data includes active zone, I/O status, measured speed, intensity of beams, and diagnostic.



### Collaborative robot monitoring

Mobile collaborative robots (cobots) have built-in safety features that enable them to work alongside humans. Cobots can be programmed to slow down or stop when a human enters the warning or safety zone.

# Choosing a Banner Relay and Controller



Start with
the SC10

- PC configured logic
- 10 safe inputs
- 2 independent safe outputs
- In-Series Diagnostics
- Ethernet/IP, Profinet, Modbus TCP

If the following are needed:
- More than 10 safe inputs
- More than 2 safe outputs



select SC26

If the following is needed:
- Up to 138 safe inputs
- Up to 68 4 safe outputs
- EtherCAT
- In-Series Diagnostics



select XS26

If the following are needed:
- Pre-configured logic
- One safe input
- One safe output



select Safety Relays

| | SC10  | Safety Relay  |
|---|---|---|
| **Configurable Logic** | ✓ | |
| **Safe Inputs** | 10 | 1 |
| **Safe Outputs** | 2 | 1 |
| **ISD (In-Series Diagnostics)** | ✓ | |
| Modbus TCP/IP PROFINET EtherNet/IP | ✓ | |
| EtherCAT | | |

| | SC26  | XS26  |
|---|---|---|
| **Configurable Logic** | ✓ | ✓ |
| **Safe Inputs** | 26 | Up to 154 |
| **Safe Outputs** | 2 | Up to 64 |
| **ISD (In-Series Diagnostics)** | | ✓ |
| Modbus TCP/IP PROFINET EtherNet/IP | ✓ | ✓ |
| EtherCAT | | ✓ |

# Relay and Controller Selection Guide

| |  GM/ES |  UM |  SM |  AT |  MMD |  SSM |  SR |  IM |  EM |  SC10 |  SC26/XS26 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | p. 46 | p. 46 | p. 46 | p. 46 | p. 46 | p. 46 | p. 46 | p. 46 | p. 46 | p. 48 | p. 48 |
| **Device Type** | | Preconfigured Safety Relay Modules | | | | | Preconfigured Safety Relay Modules | | | Configurable Controllers | |
| **Self Testing Safety Device** | | ✓ | | | ✓ | | | | | ✓ | ✓ |
| **Self Testing Safety Device with EDM Function** | | ✓ | | | ✓ | | ✓ | ✓ | | ✓ | ✓ |
| **E-Stop** | ✓ | ✓ | | | ✓ (secondary function) | | | | | ✓ | ✓ |
| **Rope Pull** | ✓ | ✓ | | | ✓ (secondary function) | | | | | ✓ | ✓ |
| **Gate Switch (potential free contacts)** | ✓ | ✓ | | | ✓ | | | | | ✓ | ✓ |
| **RFID Gate Switch (OSSD contacts)** | | ✓ | | | ✓ | | | | | ✓ | ✓ |
| **ISD Functionality** | | | | | | | | | | 2 chains | 8 chains |
| Modbus TCP/IP, PROFINET, EtherNet/IP | | | | | | | | | | ✓ | ✓ |
| EtherCAT | | | | | | | | | | | ✓ |
| **Safety Mat Monitoring** | | | ✓ | | | | | | | ✓ | ✓ |
| **Two-Hand Control** | | | | ✓ | | | | | | ✓ | ✓ |
| **Enabling Device** | ✓ | ✓ | | | | | | | | ✓ | ✓ |
| **Expandable** | | | | | | | | | ✓ | | ✓ |
| **Muting** | | | | | ✓ | | | | | ✓ | ✓ |
| **ON/OFF Delay** | | | | | | | | | OFF delay available | ✓ | ✓ |
| **Speed Monitoring** | | | | | | ✓ | | | | | |
| **Safety Standard** | Cat. 4 PL e, per EN ISO 13849-1; SIL 3 per IEC 61508 and IEC 62061 | | | | | Cat. 4 PL e, per EN ISO 13849-1; SIL 3 per IEC 61508 and IEC 62061 | | | | | |
| **Inputs** | 1 NC and 1 NO (single or dual)<br>1 NC (single)<br>2 NC (dual) | 1 NC (single) or 2 NC (dual) or 2 PNP | 1 (or multiple in series)<br>4-wire safety mat | 2 STB or buttons with complementary contacts | 2 NC mutable (dual) and 2 NC SSI (dual) | 2 PNP | 2 NC (dual) or 2 PNP | 2 NC (dual) or 2 PNP | 1 NC (single) or 2 NC (dual) | 10 | SC26: up to 26<br>XS26: up to 154 |
| **Safety Outputs** | 2 NO, 3 NO, 4 NO | 2 NO or 3 NO | 4 NO | 2 NO | 2 PNP OSSD or 2 NO | 2 NO | 2 NO, 3 NO | 2 NO, 3 NO | 4 NO or 4 NO with delay | 2x 3 NO | SC: 2<br>XS: up to 68 |
| **Maximum Safety Output Rating** | 6A, 7A | 7A | 6A | 6A | 6A | 4A | 6A | 6A | 6A | 6A each | 0.5A each |
| **Auxiliary Outputs** | 1 NC or 1 NC and 2 PNP | 1 NC, depending on model | 1 NC and 2 PNP | | 1 PNP or 1 NC | 1 NC | 1 NC | 1 NC, depending on model | | depends on configuration | depends on configuration |
| **Power Supply** | 24 V AC/DC<br>115 V AC and 12-24 V DC<br>or 230 V AC and 12-24 V DC | 24 V AC/DC | 115 V AC and 12-24 V DC<br>or 230 V AC and 12-24 V DC | 24 V AC/DC | 24 V DC | 24 V DC | 24 V DC | 24 V DC | 24 V DC or 24 V AC/DC, depending on model | 24 V DC | 24 V DC |

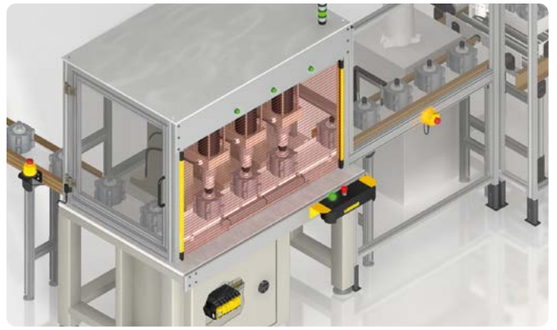
# Safety Relays and Controllers



Industrial safety controllers and relays provide an interface between safety devices and the machines and processes those devices monitor for a complete and easy-to-use safety control solution.



Safety controllers can be tailored for a wide variety of machines, including machines with multiple processes.



Configurable controllers monitor multiple safety devices, such as E-stop buttons, safety switches, safety light screens, two-hand controls, and rope pull switches.

## Safety Relays

SR-IM-9A





IM-T-9A

Cost-effective for simple safety circuits

- Preset functionality: Configuration not required
- Safety inputs: 1
- Independently controlled safety outputs: 1; 4 to 7A
- Choose from a variety of models:
  - Universal input safety relays
  - E-stop monitoring safety relays
  - Muting safety relays
  - Safe speed monitoring relays
  - Safety mat relays
  - Safety extension relays
  - Interface relays

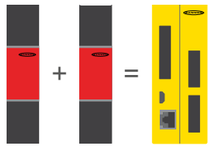
## Hybrid Safety Controller Plus 2 Safety Relays



SC10

Flexible and cost-effective solution for machines typically using 2 safety relays

- PC configurable: Flexible and easy-to-use
- Safety inputs: up to 10; up to 70 with ISD
- Independently controlled safety outputs: 2; 6A each
- Convertible safety inputs: 4
- Terminal LEDs for easy troubleshooting
- Industrial Ethernet
- Each output contains 3 NO redundant safety contacts



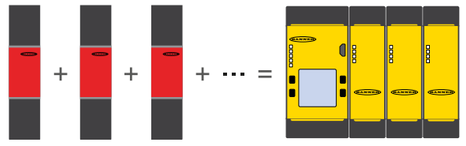
## Expandable Safety Controller



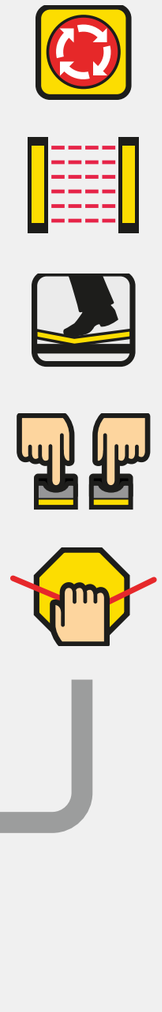
XS26

Expandable for complex safety applications where 3 or more safety relays are typically used

- PC configurable: flexible and easy-to-use
- Safety inputs: 26 (base unit) up to 154
- Independently controlled safety outputs: up to 68; 0.5A to 6A each
- Convertible safety inputs: 8 (Base Unit) up to 40
- LCD screen for easy troubleshooting
- Industrial Ethernet



Connect safety devices easily to the safety controller



# Safety Controllers

## XS26 Expandable Safety Controller

26 to 154
Safety Inputs



Safety Outputs
Safety Zones: 2 to 64
- 6A Relay 2 NO
- 0.5A Solid State

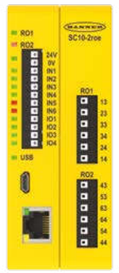
Industrial Ethernet

EtherNet/IP Modbus TCP/IP PROFINET EtherCAT

- Optional display screen allows local diagnostics for efficient troubleshooting
- Up to eight expansion I/O modules can be added as automation requirements grow or change
- Choose from six expansion module models with a variety of safety inputs, solid-state safety outputs and safety relay outputs
- Controller and input modules allow safety inputs to be converted to status outputs for efficient terminal use

## SC10 Safety Controller

10 Safety
Inputs



Safety Outputs
Safety Zone 1: 6A Relay 3 NO

Safety Zone 2: 6A Relay 3 NO

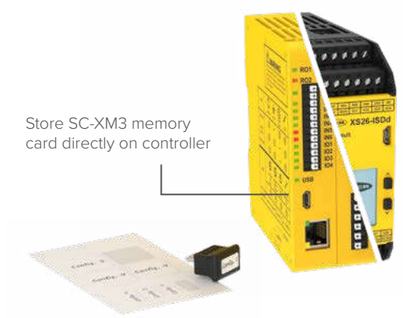
Industrial Ethernet

EtherNet/IP Modbus TCP/IP PROFINET

- 10 safety inputs
- 4 safety inputs allowed to be converted to status outputs for efficient terminal use
- 2 redundant safety outputs
- LED indication next to each output
- Industrial Ethernet two-way communication
- Programmable via USB connection
- In-Series Diagnostic capable

## Easy to Configure and Integrate with a PLC

Store SC-XM3 memory
card directly on controller



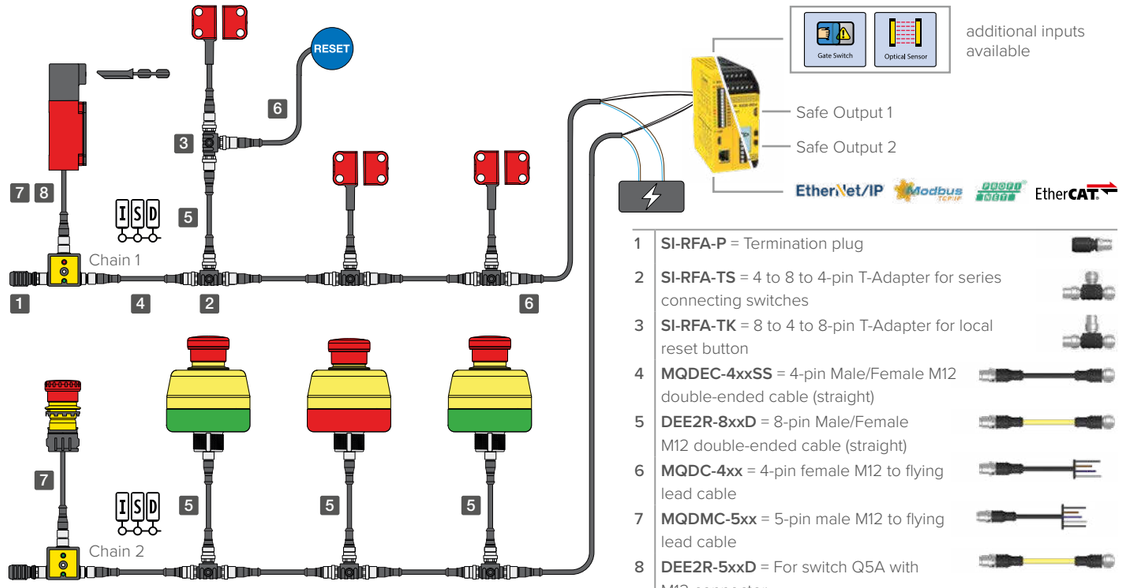
SC-XM3 Fast Programming and Swapout
- Backup copy of configuration, password, network settings
- Download configuration without a PC
- Save time during panel build
- Fast swapout minimizes downtime

- Free Software
- Intuitive PLC Integration



# In-Series Diagnostics Functionality

In-Series Diagnostics allows you to connect up to 32 devices with one in-series connection and communicate directly with the most commonly used PLCs. Achieves up to CAT4, SIL3, PLe safety rating.




| | |
|---|---|
| 1 | **SI-RFA-P** = Termination plug |
| 2 | **SI-RFA-TS** = 4 to 8 to 4-pin T-Adapter for series connecting switches |
| 3 | **SI-RFA-TK** = 8 to 4 to 8-pin T-Adapter for local reset button |
| 4 | **MQDEC-4xxSS** = 4-pin Male/Female M12 double-ended cable (straight) |
| 5 | **DEE2R-8xxD** = 8-pin Male/Female M12 double-ended cable (straight) |
| 6 | **MQDC-4xx** = 4-pin female M12 to flying lead cable |
| 7 | **MQDMC-5xx** = 5-pin male M12 to flying lead cable |
| 8 | **DEE2R-5xxD** = For switch Q5A with M12 connector |

## Compatible Devices



| Family | System Type | Reset | | Coding | Connection |
|---|---|---|---|---|---|
| **SI-RF** | **D** | **T** | – | **U** | **P8** |
| **RFID Safety Door Switch** | **D** = Cascade with (ISD) | **T** = Automatic (Trip)<br>**L** = Manual (Latch) | | **L** = Low<br>**H** = High<br>**U** = Unique | **P8** = 250 mm 8-pin M12 pigtail QD |



| Family | Color Armed | Color Pressed | Options | | Outputs | Enclosure Style | Reset |
|---|---|---|---|---|---|---|---|
| **SSA-EB1PL** | **Y** | **R** | | – | **0D** | **ECQ8** | **R** |
| **Illuminated**<br>**E-Stop** | **X** = Off<br>**Y** = Yellow Solid<br>**G** = Green Solid | **R** = Red Flashing | **Blank** = Standard<br>**S1** = Shroud Style 1 | | **0D** = OSSD Outputs with ISD | **ECQ8** = 30 mm Round<br>**ED1Q8** = Flush Mount (square) | **Blank** = Without Local Reset<br>**R** = With Local Reset |



| Family | | Device Input Type | Input Pin Configuration |
|---|---|---|---|
| **SSA-ISD** | – | **TC** | **A** |
| **ISD Connect** | | **TC** = 2 NC Sets of Dry Contacts | **A** = 5-Pin Config A |

| | Pin | | | | |
|---|---|---|---|---|---|
| **Config** | **1** | **2** | **3** | **4** | **5** |
| **A** | Ch1a | Ch1b | N/C | Ch2a | Ch2b |

# Configure Your System in Minutes

The feature-rich SC10 and SC/XS26 safety controller software provides a seamless user interface for setting up and managing safety systems. The software features an intuitive icon-based, drag-and-drop user interface to reduce the learning curve and speed up commissioning.

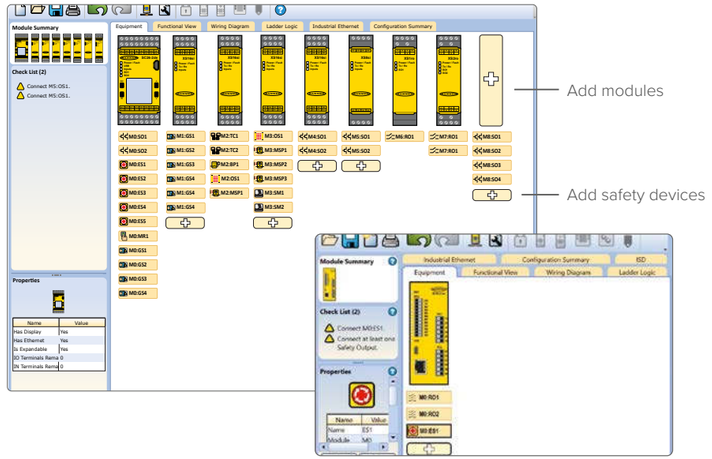
- Complex configurations made easy
- Simulate configurations before implementation
- Auto configure Industrial Ethernet for remote monitoring and diagnostics

Start using the **free software** today. Go to www.bannerengineering.com/safetycontroller

1. Choose Controller



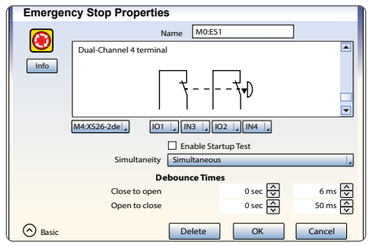

2. Equipment View



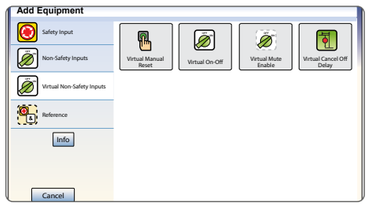

3. Add safety devices




4. Select safety device properties

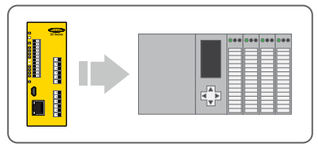



5. Add virtual non-safety inputs



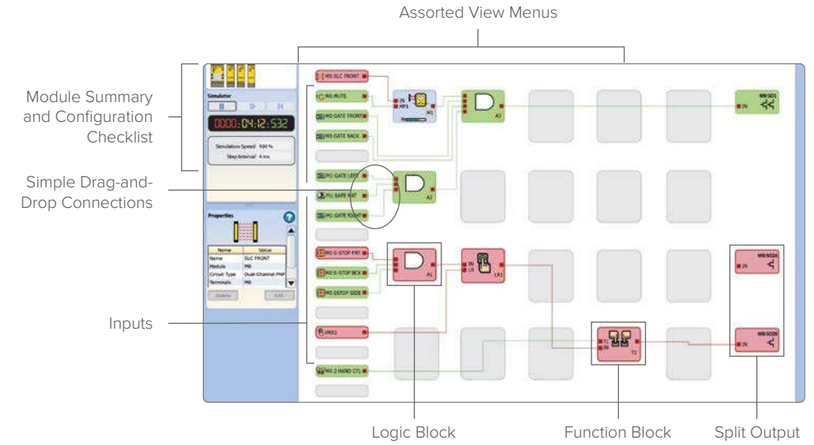

Intuitive setup and PLC integration

- Expedite PLC Integration with Tag Export Feature
- Eliminates error-prone manual entries
- Import tags to PLC via .csv or .xml files
- Defines actionable In-Series Diagnostic data within the PLC
- For more information visit bannerengineering.com/safetycontroller

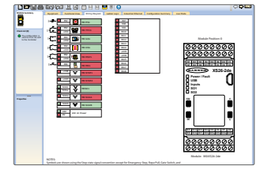




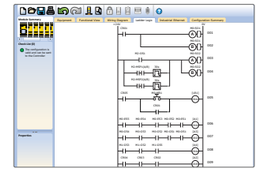
# System Software



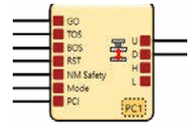

Wiring Diagram in Live Mode



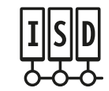
Ladder Logic



Preconfigured Press Control Function Block




## View Live Mode for Current System Status



Prevent Downtime:

Marginal — Alert to check Door 1 for misalignment **before** it causes downtime

Warning — Alert to check E-Stop 1 for low voltage **before** it causes downtime




Troubleshooting Made Easy:

Terminator missing



Actuator not taught



Up to 32 ISD safety devices in any order per chain

Reduce Downtime:
Local operator guidance to activated E-Stop

Additional uses for ISD

- Rotation/Indexing
- Tool Identification
- Position Verification

# Safety Relays

## E-Stop and Guard Safety Modules



| Supply Voltage | Inputs | Safety Outputs | Aux. Outputs | Output Rating | Output Response Time | Models |
|---|---|---|---|---|---|---|
| 24 V AC/DC | 1 NC & 1 NO (single or dual) | 2 NO | – | 6 A | 35 ms | **GM-FA-10J** |
| | 1 NC (single) or 2 NC (dual) | 3 NO | – | 6 A | 25 ms | **ES-FA-9AA** |
| | 1 NC (single) or 2 NC (dual) | 2 NO | 1 NC | 7 A | 25 ms | **ES-FA-11AA** |
| | 1 NC (single) | 3 NO | 1 NC | 6 A | 35 ms | **ES-FA-6G** |
| 115 V AC & 12-24 V DC | 1 NC (single) or 2 NC (dual) | 4 NO | 1 NC & 2 PNP | 6 A | 25 ms | **ES-UA-5A** |
| 230 V AC & 12-24 V DC | | | | | | **ES-VA-5A** |

## Universal Safety Input Modules



| Supply Voltage | Inputs | Safety Outputs | Aux. Outputs | Output Rating | Output Response Time | Models |
|---|---|---|---|---|---|---|
| 24 V AC/DC | 1 NC (single) or 2 NC (dual) or 2 PNP | 3 NO | – | 6 A | 25 ms | **UM-FA-9A** |
| | | 2 NO | 1 NC | 7 A | | **UM-FA-11A** |

## Modules for Specific Monitoring Applications



| Supply Voltage | Inputs | Safety Outputs | Aux. Outputs | Output Rating | Output Response Time | Models |
|---|---|---|---|---|---|---|
| 115 V AC & 12-24 V DC | 1 (or multiple in series) 4-wire safety mat | 4 NO | 1 NC & 2 PNP | 6 A | 50 ms | **SM-GA-5A** |
| 230 V AC & 12-24 V DC | | | | | | **SM-HA-5A** |
| 24 V AC/DC | 1 (2x2 complementary) for two-hand control | 2 NO | – | | 35 ms | **AT-FM-10K** |

## Muting Modules



| Supply Voltage | Input Device | Inputs | Safety Outputs | Aux. Outputs | Output Rating | Output Response Time | Models |
|---|---|---|---|---|---|---|---|
| 24 V DC | Electromechanical & solid state | 2 NC muteable (dual) & 2 NC SSI (dual) | 2 PNP OSSD | 1 PNP | 0.5 A | 10 ms | **MMD-TA-12B** |
| | | | 2 NO | 1 NC | 6 A | 20 ms | **MMD-TA-11B** |

## Safe Speed Monitoring Modules



| Supply Voltage | Inputs | Safety Outputs | Aux. Outputs | Output Rating | Ranges (impulses/minute) | Models |
|---|---|---|---|---|---|---|
| 24 V AC/DC | 2 PNP | 2 NO | 1 NC | 4 A | 5-40, 35-340, 300-2700, 1200-10500 | **SSM-FM-11A10** |
| | | | | | 10-80, 80-650, 600-5300, 2400-20000 | **SSM-FM-11A20** |

## Interface Modules

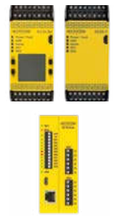


| Supply Voltage | Inputs | Safety Outputs | Aux. Outputs | Output Rating | Output Response Time | Models |
|---|---|---|---|---|---|---|
| 24 V DC | 2 NC | 3 NO | – | 6 A | 20 ms | **SR-IM-9A** |
| | | 2 NO | 1 NC | | | **SR-IM-11A** |
| | | 3 NO | – | | | **IM-T-9A** |
| | | 2 NO | 1 NC | | | **IM-T-11A** |



# Safety Controllers

## Non-expandable Safety Controllers



| Description | Housing H x W x D (mm) | Inputs/ Convertible | Independently Controlled Safe Outputs | Maximum Safety Output Rating | Features | Models (24 V DC) |
|---|---|---|---|---|---|---|
| SC26 Safety Controller | 110 x 45 x 128 | 26/8 | 2 Dual Channel PNP | 0.5A at 24 V DC | Display | **SC26-2d** |
| | | | | | Display, Ethernet | **SC26-2de** |
| | | | | | – | **SC26-2** |
| | | | | | Ethernet | **SC26-2e** |
| SC10 Safety Controller | 115 x 45 x 100 | 10/4 | 2 Dual Channel Relays | 2x 3 NO: 6A 250 V AC/ 24 V DC | ISD, Ethernet | **SC10-2roe** |

## Expandable Safety Controllers



| Description | Housing H x W x D (mm) | Inputs/ Convertible | Independently Controlled Safe Outputs | Maximum Safety Output Rating | Features | Models (24 V DC) |
|---|---|---|---|---|---|---|
| XS26 Expandable Safety Controller | 110 x 45 x 128 | 26/8 | 2 Dual Channel PNP | 0.5A at 24 V DC | Display | **XS26-2d** |
| | | | | | Display, Ethernet | **XS26-2de** |
| | | | | | – | **XS26-2** |
| | | | | | Ethernet | **XS26-2e** |
| | | | | | ISD | **XS26-ISDd** |
| Safety Input Module | W: 22.5 mm | 8/2 | – | – | – | **XS8si** |
| | | 16/4 | – | – | – | **XS16si** |
| Safety Output Module | | – | 2 Dual Channel PNP | 0.75A at 24 V DC | – | **XS2so** |
| | | – | 4 Dual Channel PNP | 0.5A at 24 V DC | – | **XS4so** |
| Safety Relay Output Module | | – | 1 Dual Channel Relay | 6A; 2 NO, 1 NC Aux (2.5A) | – | **XS1ro** |
| | | – | 2 Dual Channel Relays | 6A; 2x 2 NO, 2x 1 NC Aux (2.5A) | – | **XS2ro** |
| Network Expansion Module | | – | – | – | Ethercat | **XSeCAT** |

## Expansion Modules



| Supply Voltage | Inputs | Safety Outputs | Output Rating | Aux. Outputs | Output Response Time | Delay | Models |
|---|---|---|---|---|---|---|---|
| 24 V DC | 1 NC (single) or 2 NC (dual) | 4 NO | 6 A | – | 20 ms | – | **EM-T-7A** |
| | | | | – | 35 ms | – | **EM-F-7G** |
| 24 V AC/DC | 1 NC (single) | 4 NO w/delay | | – | – | 0.5 s | **EM-FD-7G2** |
| | | | | – | – | 1.0 s | **EM-FD-7G3** |
| | | | | – | – | 2.0 s | **EM-FD-7G4** |

## Accessories



**SC-USB2**
USB Cable



**SC-XM2**
Memory Card for XS26 and SC26



**SC-XM3**
Memory Card for SC10



**SC-XMP2**
SC-XM2/3 Configuration Tool

# Choosing a Banner Safety Switch



Start with
the SI-MAGB

- Non-contact safety switch
- 3 to 5 mm misalignment tolerance
- IP67 Rated
- Single sensor at SIL3, Ple, Cat 4

If the following are needed:
- Locking



select SI-GL42

If the following are needed:
- ISD
- Daisy Chain at SIL3, PLE Cat4
- 10 mm misalignment tolerance
- IP69 rated



select SI-RF

If the following are needed:
- Position detection



select SI-LS83

If the following are needed:
- Mechanical latch
- Hinge function



select SI-HG63
or Mechanical

| |  SI-MAGB Mag Switch |  SI-GL42 Locking Switch |  SI-RF RFID Switch |
|---|---|---|---|
| **Safety Rating (single sensor)** | Ple, CAT4 | Plc, CAT3* | Ple, CAT4 |
| **Environmental Rating** | IP67 | IP67 | IP69 |
| **ISD (In-Series Diagnostics)** | | ISD Connect Ready | ✓ |
| **Tamper Resistance - Coding Level** | Low | Low | Low, High, Unique |
| **Assured On Sao / Misalignment Tolerance (mm)** | 3 to 5 | | 10 |

*Ple/Cat 4 achieved with applicable second safety switch added

| |  SI-LS83 Limit Switch |  SI-HG63 Hinge Switch |  Mechanical Switches |
|---|---|---|---|
| **Safety Rating (single sensor)** | Plc, CAT3* | Plc, CAT3* | Plc, CAT3* |
| **Environmental Rating** | IP65 | Up to IP69 | IP65 |
| **ISD (In-Series Diagnostics)** | | ISD Connect Ready | ISD Connect Ready |
| **Tamper Resistance - Coding Level** | Low | Low | Low |
| **Assured On Sao / Misalignment Tolerance (mm)** | | | |

# Safety Switches Selection Guide

| |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|
| | **SI-MAG** | **SI-RF** | **SI-LS** | **SI-QS** | **SI-LM40** | **SI-GL42** | **SI-LS42** | **SI-LS83** | **SI-HG63** | **SI-HG80** |
| | p. 58 | p. 60 | p. 58 | p. 58 | p. 58 | p. 58 | p. 58 | p. 58 | p. 58 | p. 58 |
| **Device Type** | Magnetic | RFID | Lockable | | Lockable | | | | Hinge | |
| **Switch Style** | Non-Contact | Non-Contact | Separate Actuator | Separate Actuator | Separate Actuator | Separate Actuator | Separate Actuator | Limit | Hinge | Hinge |
| **Non-Locking** | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| **Locking** | | | | | | ✓ | ✓ | | | |
| **Position** | ✓ | ✓ | | | | | | Plunger, Roller, Spindle-mount, Lever | | |
| **Contacts** | 1 NC, 1 NO | OSSD PNP | 2 NC, 1 NO<br>1 NC, 1 NO<br>2 NC | 1 NC, 1 NO<br>2 NC<br>2 NC, 1 NO<br>1 NC | 1 NC, 1 NO<br>2 NC<br>2 NC, 1 NO | 1 NO<br>1 NC<br>1 NC, 1 NO<br>2 NC<br>2 NC, 1 NO<br>3 NC | 1 NC, 1 NO<br>2 NC, 1 NO<br>1 NC<br>2 NC<br>3 NC | 1 NC, 1 NO<br>2 NC<br>2 NC, 1 NO | 2 NC, 1 NO | SPDT |
| **Locking or Unlocking Power** | | | | | | 24 V AC/DC | 24 V AC/DC<br>110 V AC/230 V AC | | | |
| **Straight Rigid Inline** | | | ✓ | | ✓ | ✓ | ✓ | | | |
| **Rigid Inline** | | | ✓ | ✓ | | ✓ | | | | |
| **Flexible Inline** | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| **High-Force Accessory** | | | | ✓ | | | | | | |
| **LED Status Indication** | | ✓ | | | | | | | | |
| **Cascadable** | | ✓ | | | | | | | | |
| **ISD (In-Series Diagnostics)** | | ✓ | | | | | | | | |
| **Coding level / Manipulation protection EN ISO 14119** | Low coding | Unique/Low/High coding | Low coding | Low coding | Low coding | Low coding | Low coding | Uncoded | Uncoded | Uncoded |
| **Housing Material** | Plastic | Plastic | Plastic | Plastic | Metal | Head: Metal<br>Body: Plastic | Plastic | Plastic | Metal | Metal |
| **Locking** | | | | | | Spring lock<br>Solenoid lock | Spring lock<br>Solenoid lock | | | |
| **Actuation Extraction Force** | | | 10 N | 10 N<br>High-Force models: adjust. from 50-100 N | 10 N, 20 N | 1500 N<br>when locked | 2000 N<br>when locked | | | |

# Safety Switches







The SI-GL42D fail-safe guard locking switch has several guard locking options: manual, spring-to-lock, or power-to-lock.

The safety switch can manually be unlocked using a tool in case of maintenance work. Emergency or escape release are additional functions that allow for quick intervention when required.

In spring-to-lock models, the guard is locked by spring force. To unlock, the solenoid must be energized.

In power-to-lock models, the guard is locked when the solenoid is energized. To unlock, power must be switched off.

## Hinge Switches



- One-piece sensor and actuator with hinge function
- Fast installation and setup with repositionable safety switch point
- Stainless steel and IP69 available
- Matching hinges without sensing available for additional door support
- Available with up to 270° safety switch point operation range

## Non-Contact Switches



- Two-piece design where sensor and actuator do not contact
- Coded magnets/tags minimize the potential for intentional defeat
- A single pair can achieve up to Category 4/PLe safety rating
- Accommodating to misalignment
- Non contact solution minimizes device wear and tear, even in applications with persistent use
- Up to IP69 solutions available

## Mechanical Switches



- Two-piece design with mechanical operator feedback
- Flexible actuator options for misalignment
- Rotatable heads for flexible installation
- Mechanically coded actuator to minimize tampering
- Up to 15N latching force to reduce downtime due to vibrating doors
- One-piece limit switches available

## Locking Switches

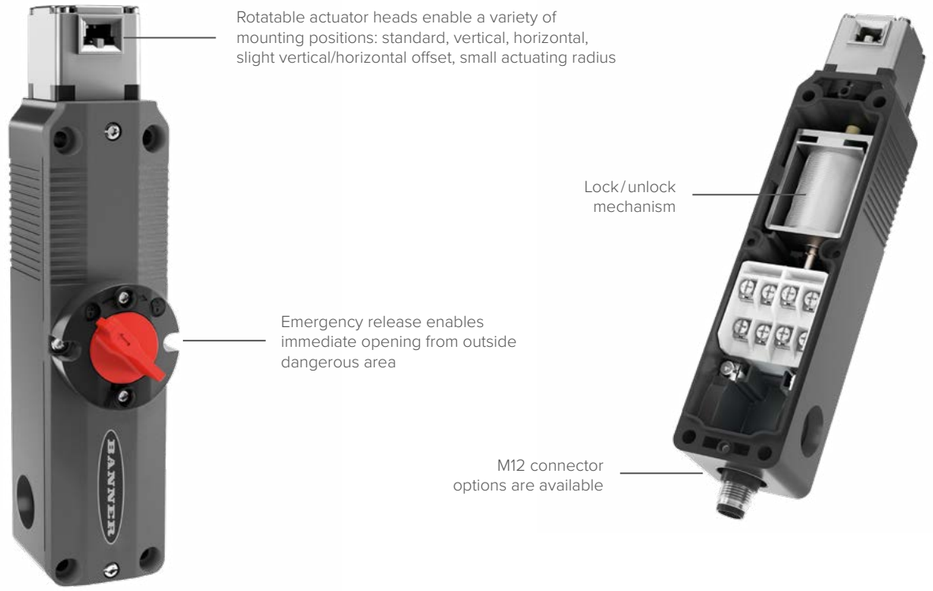


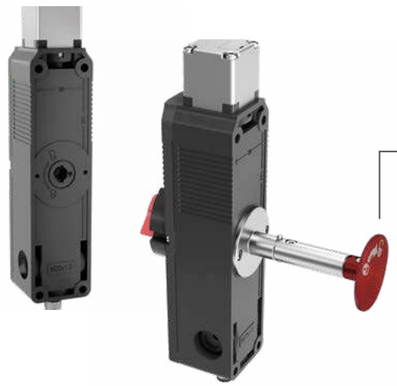
- Two-piece design with up to 2000N locking force for safety or process critical applications
- Flexible actuator options for misalignment
- Rotatable heads for flexible installation
- Mechanically coded actuator to minimize tampering
- Up to 15N latching force to position door prior to locking

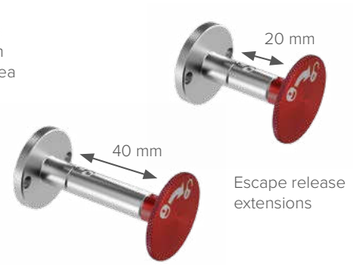
## Limit Switches



- Cost effective one piece sensor
- No actuator allows for fewer alignment issues
- Hideable making them more tamper resistant
- Rotating head and top or side engagement allows for eight different actuator positions
- Design meets positive opening requirements for safety switches



# Non-Contact RFID Safety Switches



Safety switches respond when a mechanical guard is opened. They feature “positive opening” contacts for high reliability regardless of environmental conditions and withstand attempts to override the switch and defeat the system.

## RFID SI-RF Switches



Single door RFID non-contact gate/door sensing solution

- Basic, medium, and high tamper resistance
- Misalignment tolerance of 10 mm
- Resistant to high vibration and operations with metallic shavings
- On-board LED for status and diagnostics

## RFID SI-RF Switches – Cascade



Multiple door RFID non-contact gate/door sensing solution

- Basic, medium, and high tamper resistance
- Misalignment tolerance of 10 mm
- Resistant to high vibration and operations with metallic shavings
- On-board LED for status and diagnostics
- Connect up to 32 sensors in cascade while maintaining the highest level of safety
- 4-pin QD connections for cost-effective, simple, error-free installation
- RFID cascade with In-Series Diagnostics available



# Enabling Devices




A two-hand control safeguarding system will prevent the operator from approaching the machine while a hazard is present. Duo-Touch Run Bar provides an all-in-one solution.



Handheld grip-styled switches are used for manual control of machine functions including visual observations, minor adjustments, calibration, and more.

## Two-Hand Control



**STB Self-Checking Touch Buttons**

| Connection | Touch Surface Material | Output | Power Supply | Models |
|---|---|---|---|---|
| 2 m cable | Polyetherimide (PEI) | Solid-state 2 Complementary PNP (1 ON, 1 OFF) | 10-30 V DC | **STBVP6** |
| 4-pin M12 QD | | | | **STBVP6Q5** |
| 2 m cable | | E/M Relay 2 Complementary SPST (1 NC, 1 NO) | 20-30 V AC/DC | **STBVR81** |
| 5-pin M12 QD | | | | **STBVR81Q6** |

STB buttons include yellow field cover to prevent unintended switching. To comply to safety standards, STB buttons must be used with appropriate Two-Hand control modules, SC26, XS26 or SC10 Safety Controller or comparable Type IIIC Two-Hand system.



**DUO-TOUCH Two-Hand Control Kits with STB Touch Buttons**
**2 NO safety outputs, no auxiliary outputs, 24 V AC/DC, Cat 4 and Type IIIC**

| Module | IP Rating | STB Buttons (2 pieces) | IP Rating | Connection | Kits |
|---|---|---|---|---|---|
| AT-FM-10K | IP20 | STBVP6 | IP66 | 2 m cable | **ATK-VP6** |
| | | STBVP6Q5 | | 4-pin M12 QD | **ATK-VP6Q5** |

Kit does not include run bar

## Two-Hand Control Run Bars



**Run Bars with STBVP6**

| Models | IP Rating | Models | IP Rating | Connection | E-Stop |
|---|---|---|---|---|---|
| **STBVP6-RB1** | IP20 | STBVP6-RB2 | IP65 | Terminal strip | Not included |
| **STBVP6-RB1Q8** | | STBVP6-RB2Q8 | | 8-pin 7/8 QD | Not included |
| **STBVP6-RB1E02** | | STBVP6-RB2E02 | | Terminal strip | SSA-EBM-02L |

## Enabling Devices



**ED1G Enabling Devices**

| Contact Configuration | Momentary Push Button | Models |
|---|---|---|
| 2 NO & 1 NC Aux | – | **ED1G-L21SM-1N** |
| 2 NO & 1 NC Aux | 1 NO | **ED1G-L21SMB-1N** |
| 2 NO | 2 NO | **ED1G-L20MB-1N** |

# Safety Switches

## Magnetic Switches



| Family | Housing | Device Type | Connection Orientation | Connection |
|---|---|---|---|---|
| **SI-MAGB** | **1** | **SM** | | |
| | **1** = Rectangular<br>**2** = Small<br>**3** = Round | **SM** = Sensor<br>**MM** = Magnet | **Blank** = Standard<br>**CO** = Opposite | **Blank** = 3 m cable<br>**QD** = 4-pin QD<br>**-W/30** = 9 m cable |

NOTE: When ordering housing 1 or 2 with a QD connection, you will receive an M8 Pico connector. When ordering housing 3 with a QD connection you will receive an M12 Euro connector.

## RFID Switches



**SI-RF-A** or **SI-RF-A2** actuator is required to complete a sensor solution (ordered separately)



SI-RF-A2

| Family | System Type | Reset | | Coding | Connection |
|---|---|---|---|---|---|
| **SI-RF** | **P** | **T** | — | **U** | **P8** |
| | **P** = Single<br>**S** = Cascade<br>**D** = Cascade with ISD | **T** = Automatic (Trip)<br>**L** = Manual (Latch) | | **L** = Low<br>**H** = High<br>**U** = Unique | **P8** = 250 mm pigtail, M12 8-pin QD<br>**2M** = 2 m cordset*<br>**P5** = 250 mm, M12 5-pin QD* |

*Available on single models only

**Tamper Resistant Coding**

Low (L): The SI-RF Safety Switch accepts any SI-RF-A actuator

High (H): The SI-RF Safety Switch only accepts the last taught-in actuator, a maximum of 12 teach-in processes are possible

Unique (U): The SI-RF Safety Switch only accepts the taught-in actuator, and only one teach-in process is possible

## Hinge Switches



| Family | Contact Configuration | Connection | Switch Position | Connection Exit | Washdown Rating |
|---|---|---|---|---|---|
| **SI-HG63** | **F** | **QD** | **R** | | **-W** |
| **SI-HG63** = Stainless Steel<br>**SI-HGZ63** = Zinc Die-cast | **F** = 2 NC/1 NO | **QD** = 6-pin Micro-style QD<br>**5M** = 5 m cable with flying leads | **R** = Switch mounted on right side of hinge<br>**L** = Switch mounted on left side of hinge<br>**B** = Switches mounted on both sides of hinge* | **Blank** = Inline QD/Cable<br>**R** = Right angle QD/Cable | **Blank** = IP67<br>**-W** = IP69 Washdown* |

*Stainless steel models only

## Brackets



**SI-HG80DQD**

Inline QD Fitting



**SI-HG80DQDR**

Right-angle QD Fitting



**SI-HG80A**

Blank Hinge



**SI-HG63A**

Blank Hinge

## Adaptor Cable



**MQEAC-601-Q5A**

SI-HG63 to ISD Connect Adaptor Cable

## Mechanical Switches



| Family | Body Style | Contact Configuration | Connection |
|---|---|---|---|
| **SI-LS** | **83** | **D** | |
| | **83** = 83 mm<br>**100** = 100 mm | **D** = 1 NO/1 NC (83 mm models only)<br>**E** = 2 NC (83 mm models only)<br>**F** = 2 NC/1 NO (100 mm models only) | **Blank** = Screw terminals<br>**Q5A** = M12 connector; ISD Connect Compatible (SI-LS83E-Q5A and SI-LS100F-Q5A only) |

## Actuators



**SI-QS-SSA-2**

Straight Rigid Inline Actuator



**SI-QS-SSA-3**

Right-Angle Rigid Inline Actuator



**SI-QS-SSU**

Flexible Inline Actuator



| Family | Body Style | Contact Configuration | Connection |
|---|---|---|---|
| **SI-LM** | **40MKH** | **D** | |
| | **40MKH** = Inline actuator | **D** = 1 NO/1 NC<br>**E** = 2 NC<br>**F** = 2 NC/1 NO | **Blank** = Screw terminals<br>**Q5A** = M12 connector; ISD Connect Compatible (SI-LM40KHE-Q5A only) |

## Actuators



**SI-QM-SSA**

Straight Rigid Inline Actuator



**SI-QM-SMFA**

Flexible Inline Actuator

# Safety Switches

## Locking Switches



| Family | Lock/Unlock | Actuator Contacts | Solenoid Monitors Contacts | Connection |
|---|---|---|---|---|
| SI-GL42D | S | 01 | 10 | |

**S** = Power to Unlock
**M** = Power to Lock

**01** = 1 NO
**10** = 1 NC
**11** = 1 NC/1 NO
**20** = 2 NC
**21** = 2 NC/1 NO
**30** = 3 NC

**10** = 1 NC
**11** = 1 NC/1 NO
**20** = 2 NC
**21** = 2 NC/1 NO

**Blank** = Screw terminals
**Q13** = M12 bottom connector; ISD Connect compatible and M12 side connector for lock/unlock function (SI-GL42DM01-20Q13 and SI-GL42DS01-20Q13 only)

### Actuators



**SI-QM-SSA-2**
Straight rigid actuator for sliding or removable guards



**SI-QM-SSA-2RA**
Flat rigid actuator for sliding or removable guards



**SI-QM-SMFA-2**
Flexible actuator for small hinged guards 150 mm or larger



**SI-QM-SMFA-3**
Flexible actuator for small hinged guards 400 mm or larger

## Unlock Mechanism



**SI-QM-SSA-SHER**
Sliding door handle with emergency release
(-SH model without emergency release)



**SI-GL42-ERS-F-1**
Front mount emergency release lever



**SI-GL42-ERS-B-1**
Back mount emergency release lever



**SI-GL42-ERBD-B-1**
Back mount escape release mechanism



**SI-GL42-EM20-1**
20 mm extension for escape release mechanism



**SI-GL42-EM40-1**
40 mm extension for escape release mechanism



## Locking Switches



| Family | Solenoid Voltage | Lock/Unlock | Contact Configuration |
|---|---|---|---|
| SI-LS42 | D | S | G |

**D** = 24 V AC/DC
**W** = 110 V/230 V AC

**S** = Power to Unlock
**M** = Power to Lock

| Actuator | Solenoid |
|---|---|
| **G** = 1 NO/1 NC | 1 NO/1 NC |
| **H** = 2 NC | 1 NO/1 NC |
| **I** = 2 NC/1 NO | 1 NC |
| **J** = 3 NC | 1 NC |

### Actuators



**SI-QM-SSA**
Straight Rigid Inline Actuator



**SI-QM-SMFA**
Flexible Inline Actuator

## Limit Switches



| Family | Body Style | Actuator Type | Contact Configuration |
|---|---|---|---|
| SI-LS | 83 | PB | D |

**PB** = Plunger
**RC10** = Roller
**LA18** = Spindle-mount lever (18 mm roller)
**LE13** = Lever (13 mm roller)

**D** = 1 NO/1 NC
**E** = 2 NC

# Choosing a Banner E-Stop Device



Start with the
Panel Mount E-Stop

If the following is needed:
- ISD



select ISD Connect

If the following is needed:
- Long Run



select 30 mm Mount, Flush
Mount, or Rope Pull

If the following are needed:
- ISD
- Daisy Chain at SIL3, PLE Cat4



select 30 mm Mount or
Flush Mount with ISD
or ISD Connect

If the following is needed:
- Handheld Machine Control



select ED1G





| | Panel Mounted E-Stop | 30mm Mount Illuminated E-Stop |
|---|---|---|
| **ISD (In-Series Diagnostics)** | ISD Connect Ready | ✓ |
| **Illumination** | Button Option | Base 360 Degrees |
| **Fully Assembled with M12 QD** | Option | ✓ |
| **Long Run (ie. conveyors)** | | ✓ (daisy chain) |
| **Shrouded & Lockable Option** | ✓ | ✓ |
| **Handheld Manual Control** | | |







| Flush Mount Illuminated E-Stop | Rope Pull | ED1G Enabling Device |
|---|---|---|
| ✓ | ISD Connect Ready | |
| Base 360 Degrees | K30 Option | |
| ✓ | Option | |
| ✓ (daisy chain) | ✓ (continuous) | |
| ✓ | | |
| | | ✓ |

# E-Stop Devices Selection Guide

| |  SSA-EBM |  SSA-EB |  SSA-EB1PL |  SSA-EB1P |  SSA-EB1M |  RP-RM83 |  RP-LS42 |  RP-QM(T)72 |  RP-LM40 |  RP-QM90 |
|---|---|---|---|---|---|---|---|---|---|---|
| | p. 70 | p. 70 | p. 70 | p. 70 | p. 70 | p. 71 | p. 71 | p. 71 | p. 71 | p. 71 |
| | Panel Mount Emergency Stop Buttons | | Emergency Stop Buttons | | | Rope Pull Emergency Stop Switches | | | | |
| **E-Stop** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| **Rope Pull** | | | | | | ✓ | ✓ | ✓ (only stop control) | ✓ (only stop control) | ✓ |
| **Button Size (mm)** | 40 mm | 40, 44, 60 mm | 40, 60 mm | 40, 60 mm | 44 mm | 32 mm | 32 mm | | | |
| **Illuminated Housing** | | | ✓ | | ✓ | | | | | |
| **Illuminated Button** | | ✓ | ✓ | ✓ | | | | | | |
| **Release** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| **Lock/Unlock Button** | | ✓ (SSA-EB1M only) | | | ✓ | | | | | |
| **Rope Length (m)** | | | | | | 38 m<br>70 m | 25 m<br>37.2 m<br>75 m | 6 m<br>12 m<br>20 m | 6 m | 50 + 50 m |
| **Rope Connection** | | | | | | Built-in turnbuckle or ring connection | Built-in turnbuckle or ring connection | Ring connection | Ring connection | Ring connection |
| **ISD (In-Series Diagnostics)** | | | ✓ | ✓ | | | | | | |
| **Safety Contacts** | 1 NC<br>2 NC | 1 NC<br>2 NC<br>3 NC<br>4 NC | 1 NC<br>2 NC<br>4 NC | 1 NC<br>2 NC<br>4 NC | 1 NC<br>2 NC<br>4 NC | 2 NC | 2 NC | 2 NC<br>4 NC | 2 NC | 2 NC |
| **Auxiliary Contacts** | 1 NO | 1 NO<br>2 NO | 1 NO<br>2 NO | 1 NO<br>2 NO | 1 NO<br>2 NO | 2 NO | 2 NO | 1 NO<br>(specific models) | | 2 NO |
| **OSSD Outputs** | | | ✓ | ✓ | | | | | | |
| **Connection** | Screw terminals | Screw terminals | M12 or Screw terminals | M12 or Screw terminals | M12 or Screw terminals | Screw terminals | Screw terminals | Screw terminals | Screw terminals | Screw terminals |
| **Panel/Bracket Hole (mm)** | 22 mm | 30 mm | 30 mm | 30 mm | | | | | | |

# E-Stop Devices

## E-Stop Buttons*

| Family | Version | Button Body | LED Function | Options | | Interface/Contact Configuration | Enclosure | Termination | Connection | Extension |
|---|---|---|---|---|---|---|---|---|---|---|
| SSA–E | B1 | M | | | – | 02 | EC | | | |

**B1** = Palm button, 40/44 mm button, 30 mm hole
**B2** = Palm button, 60 mm button, 30 mm hole



**Blank** = none
**L** = OFF/red solid
**LYR** = yellow/red
**LGR** = green/red
**LXR** = OFF/red flashing
**L2** = Illuminated push button; Push = ON

**Blank** = Standard
**P** = Padlock capable
**S1** = Shroud style 1

**EC** = Compact OTB-style enclosure, 30 mm mounting
**ED** = DX80-style enclosure

**M** = Metal lockable base button
**P** = Plastic base button

**02** = 2 NC
**04** = 4 NC
**11** = 1 NO/1 NC
**12** = 1 NO/2 NC
**13** = 1 NO/3 NC
**22** = 2 NO/2 NC
**0D** = 2 Solid-state with ISD

**Blank** = Bottom exit (1x QD)
**1** = One side exit (1x male QD if used)

**Blank** = Connection with terminals
**Q#** = number of pins/conductors

**Blank** = none
**A** = AB 1732DS Safety I/O
**B** = Siemens ET200pro/Turck
**R** = External manual reset for solid-state outputs

## Accessories



**SSA-EB1P-ECWC**

FDA Grade Silicone Washdown Cover, IP67 and IP69 rated



**SSA-MBK-EEC1**



**SSA-MBK-EEC2**



**SSA-MBK-EEC3**

## Panel Mount E-Stop Buttons*

| Family | Version | Button Body | | LED Function | Options | Interface/Contact Configuration | Connection |
|---|---|---|---|---|---|---|---|
| SSA–E | B1 | M | – | | | 02 | 02 |



**B1** = Palm button, 40/44 mm button, 30 mm hole
**B2** = Palm button, 60 mm button, 30 mm hole

**M** = Metal lockable base button
**P** = Plastic base button

**Blank** = none
**L1** = Illuminated push button Independent wire

**Blank** = Standard
**P** = Padlock capable
**S1** = Shroud style 1

**02** = 2 NC
**04** = 4 NC
**11** = 1 NO/1 NC
**12** = 1 NO/2 NC
**13** = 1 NO/3 NC
**22** = 2 NO/2 NC

**Blank** = Screw terminals
**A01** = M12 QD; ISD Connect compatible (SSA-EB1P-02-A01 only)



*Not all combinations are orderable. Visit bannerengineering.com for available models.

## E-Stop Button Kits



| Family | Version | Button Body | | Interface/Contact Configuration | Enclosure |
|---|---|---|---|---|---|
| SSA–E | B | M | – | 02 | L |

**B** = Palm button, 40 mm button, 22 mm hole

**M** = Metal base button

**02** = 2 NC
**11** = 1 NO/1 NC
**12** = 1 NO/2 NC

**L** = Yellow ring label "Emergency Stop", without enclosure
**E** = Yellow ring label "Emergency Stop", with enclosure

## Rope Pull E-Stop Devices



| Maximum Rope Length | Rope Connection | Safety Contacts | Auxiliary Contacts | Actuation | Housing Material | Models |
|---|---|---|---|---|---|---|
| 38 m | Built-in turnbuckle | 2 NC in | 2 NO in | Latch | Metal, IP67 | RP-RM83F-38LT |
| 75 m | | | | | | RP-RM83F-75LT |
| 38 m | Ring connection | | | | | RP-RM83F-38LR |
| 75 m | | | | | | RP-RM83F-75LR |
| 25 m | Built-in turnbuckle | | | | Plastic | RP-LS42F-25LE |
| 37.5 m | | | | | | RP-LS42F-38LE |
| 75 m | | | | | | RP-LS42F-75LE |

Note: For auxiliary status output models add E to the end of the model number (example, RP-RM83F-38LTE)

## Rope Pull Switches



| Maximum Rope Length | Rope Connection | Safety Contacts | Auxiliary Contacts | Actuation | Housing Material | Models |
|---|---|---|---|---|---|---|
| 25 m | Ring connection | 2 NC in | 2 NO in | Latch | Plastic | RP-LS42F-25L |
| 37.5 m | | | | | | RP-LS42F-38L |
| 75 m | | | | | | RP-LS42F-75L |
| 25 m | Built-in turnbuckle | | | | | RP-LS42F-25LF |
| 37.5 m | | | | | | RP-LS42F-38LF |
| 75 m | | | | | | RP-LS42F-75LF |
| 6 m | – | 2 NC in | – | Latch | Metal | RP-QM72D-6L |
| 12 m | | | | | | RP-QM72D-12L |
| 20 m | | | | | | RP-QM72D-20L |
| 12 m | | 4 NC in | 1 NO in | | | RP-QMT72F-12L |
| 6 m | | 2 NC in | – | Trip | | RP-QMT72E-12L |
| 100 m (50 m each side) | | | 2 NO in | Latch | | RP-LM40D-6 |
| | | | | | | RP-LM40D-6L |
| | | | | | | RP-QM90F-100L |

## Components for Wire Rope Assembly



**RPA-C**
Wire Ropes



**RPA-T**
Thimbles



**RPA-CC**
Clamps



**RPA-TA**
Turnbuckles



**RPA-EB**
Eye Bolts



**RPA-P**
Pulleys



**RPA-DP**
Deflection Pulleys



**RPA-S**
Tensioning Springs

Hardware kits are available (RPAK)

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