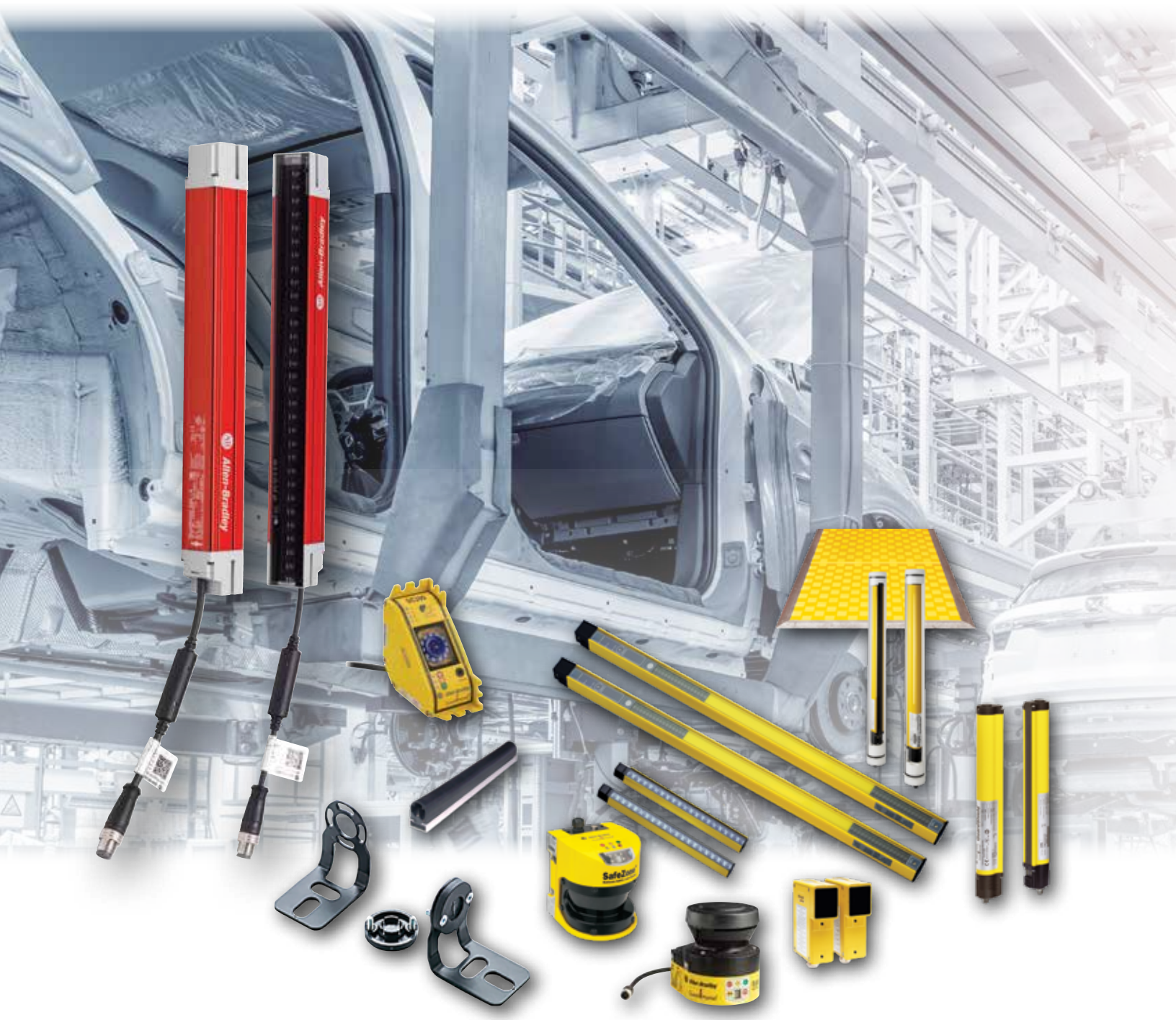


# Presence Sensing Safety Devices

Optimal Safety and Productivity



LISTEN.  
THINK.  
SOLVE.®

Allen-Bradley • Rockwell Software




**Rockwell  
Automation**

# ROCKWELL AUTOMATION TAKES SAFETY SERIOUSLY

Allen-Bradley® GuardShield™ presence sensing safety devices from Rockwell Automation® help protect personnel and equipment by detecting the presence of people and objects within a guarded area around machinery. Presence sensing safety devices are ideal for applications where personnel need frequent and easy yet safe access to hazardous areas near robotic welding, machining centers, stamping, hydraulic presses, filter presses or packaging equipment. Whether the need is finger, hand or whole body protection, our knowledgeable team of experts understand how to apply a comprehensive safety solution for your manufacturing facility.

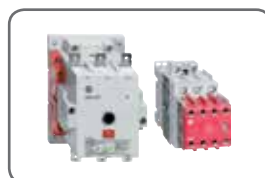
Built to global standards for high reliability, stability and quality, Rockwell Automation solutions are ideally suited for applications where personnel safety is a priority. Our innovative products and services help protect your people, machinery, and environment while maximizing uptime.

## PRESENCE SENSING SAFETY DEVICES

	GuardShield 450L-B	GuardShield 450L-E	GuardShield 440L-Type4 POC	SC300 Hand Detection Safety Sensor	Micro 400 with MSR41 Controller	Micro 400 with MSR42 Controller	GuardShield 440L-Type4 PAC	445L Safe4 PAC	Area Access Control (AAC) Single Beam	SafeZone Safety Laser Scanners	MatGuard Safety Mats	Safedge Safety Edges
Finger Detection 	●	●	●		●	●						●
Hand Detection 	●	●	●	●	●	●				●		●
Whole Body Detection 							●	●	●	●	●	●
<b>Functionality</b>												
Point of Operation Control (POC)	●	●	●	●	●	●				●		●
Perimeter Access Control (PAC)							●	●		●		
Area Access Control (AAC)								●	●	●		
<b>Advanced Features</b>												
Transceiver Architecture – One stick can be transmitter or receiver	●	●										
Fixed Blanking		●	●			●						
Floating Blanking/Reduced Resolution		●	●			●						
Integrated Laser Alignment		●	●				●	●				
Beam Coding		●	●				●					
External Device Monitoring (EDM)	●	●	●	●		●	●			●		
Auto/Manual Restart Selection	●	●	●	●		●	●	●	●	●	●	
Auxiliary Output	●	●	●			●	●					
Cascading – Series connection of multiple safety light curtains		●	●		●	●						
Integrated Muting – Temporary automatic disabling of the safety function		●				●						



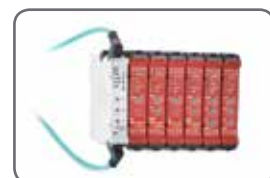
Variable speed and servo drives



Safety contactors



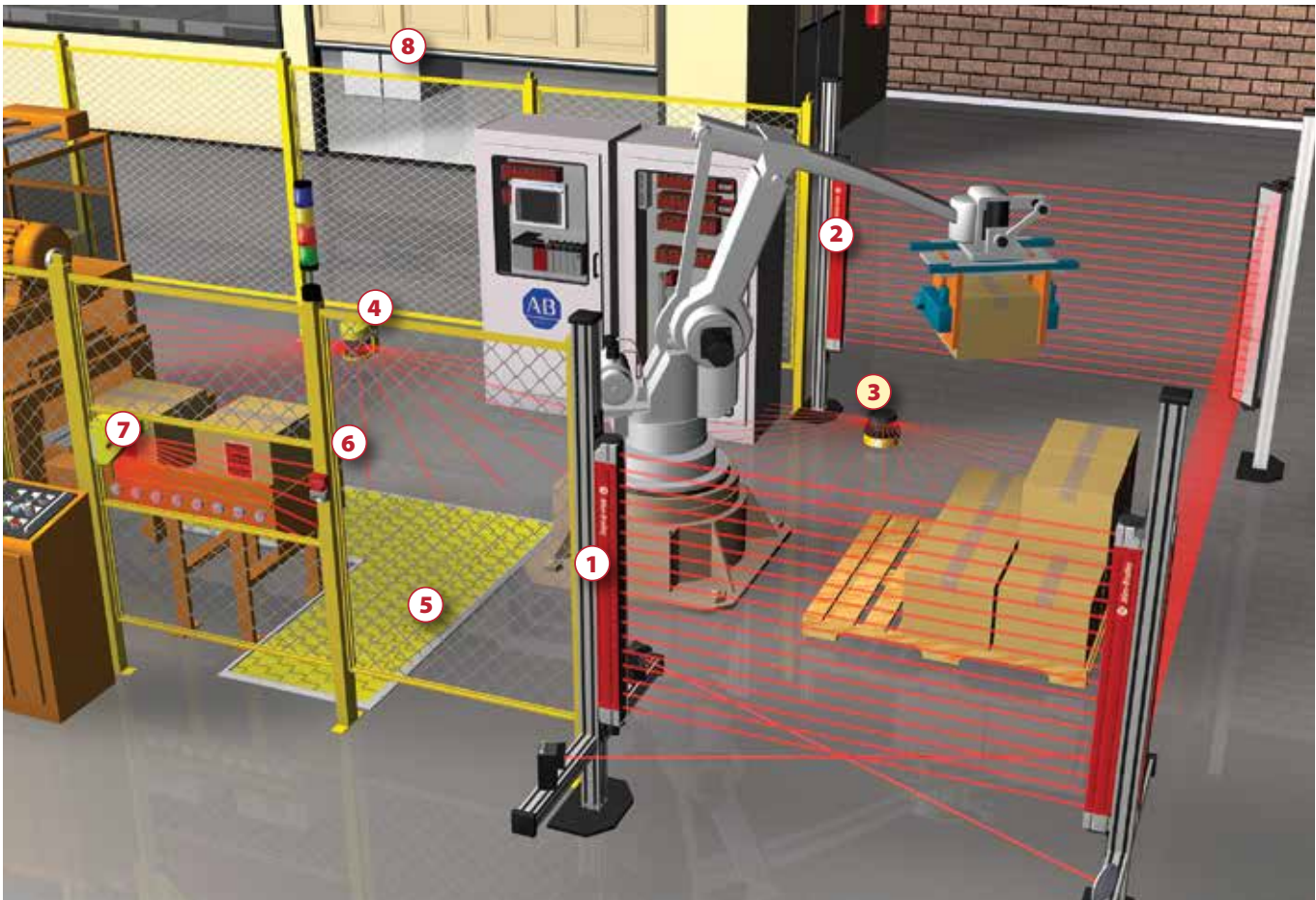
GuardLogix® and Compact GuardLogix



Safety relays



# PRESENCE SENSING SAFETY APPLICATIONS



**Note:** Representative applications only. Actual solutions may vary.

**1**

GuardShield™ safety light curtain with two retroreflective muting sensors allows work cell access without stopping all processes. This design allows a fork truck to enter the work cell to remove the empty pallet and replace it with a fully loaded pallet.

**2**

Safety light curtain with corner mirror provides perimeter guarding for the work cell. This configuration allows elimination of fencing or hard guarding and offers detection of personnel if they interrupt the sensing field.

**3  
&  
4**

SafeZone™ safety laser scanners mounted horizontally provide area detection inside the work cell. Safety laser scanners can be easily configured to scan irregular areas inside of the work cell. They are a non-contact alternative to pressure-sensitive safety mats.

**5**

MatGuard™ pressure sensitive safety mats around the entry area of a machine process help to detect the presence of personnel inside of the work cell.

**6**

Gate interlock safety switches help to stop hazardous motion inside of the work cell if personnel attempt to enter through the gate area.

**7**

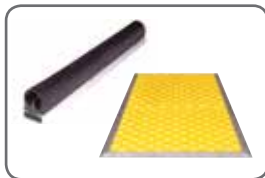
The SC300 safety sensor is used for hand detection at a hazardous machine access point of the work cell. The SC300 is a reflective safety sensor that creates a detection plane in openings of various shapes and sizes.

**8**

A Safedge™ pressure-sensitive safety edge is mounted to a moving piece of machinery such as the bottom of a powered garage door to prevent personnel from bodily injury. Light pressure from any direction through 90° on the profile will trip the system.



Safety light curtains and scanners



Pressure sensitive devices



Tongue and hinge switches



Cable pull switches

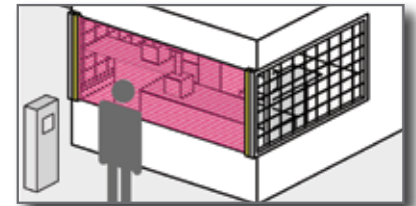


Enabling switches

# FUNCTIONALITY AND ADVANCED FEATURES

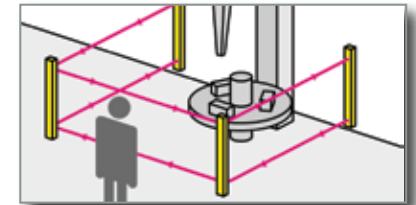
## Point of Operation Control (POC)

POC safety light curtains are typically designed to detect the presence of a finger or hand. These devices are usually positioned in front of the point of operation hazard, close to the machine opening. However, they may also be used for perimeter guarding applications. They can be mounted vertically or horizontally.



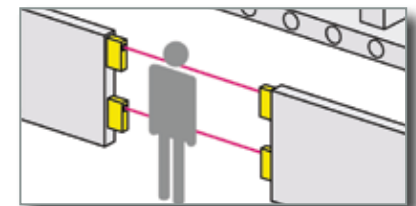
## Perimeter Access Control (PAC)

PAC safety light curtains are used as whole body detection devices for detection of personnel or large objects when they pass through the sensing field. They are typically positioned around an area or in front of a process entry or exit area. Typically they do not require frequent interaction between personnel and the hazard during regular operation. Multi-sided access control is attained through the use of corner mirrors.



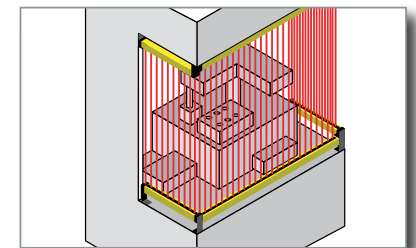
## Area Access Control (AAC)

AAC uses a single-beam emitter and receiver unit to create a protective barrier around hazardous machines including robotic cells, transfer stations, palletizers and loading machines. Two-beam or multi-sided access control is attained through the use of corner mirrors.



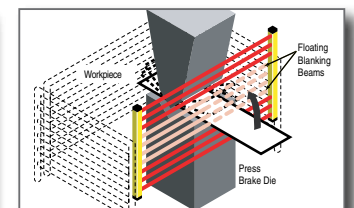
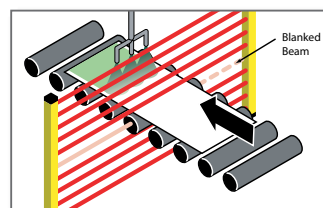
## Cascaded Safety Light Curtains

With a single cascaded light curtain system, the user can safeguard two adjacent points of entry. Using the cascade configuration, up to four pairs of light curtain segments can combine to offer protection in different planes. Often cascaded safety light curtains are used to combine vertical protection against reaching in with horizontal protection to detect someone standing behind the vertical light curtain.



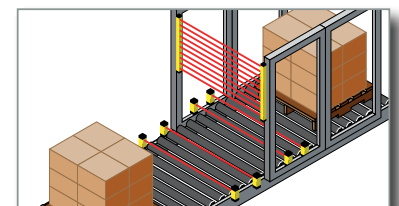
## Fixed and Floating Blanking

The blanking function is a means of disabling one or more sections of a POC light curtain's sensing field. There are two blanking modes: fixed for static and floating for moving disabled sections.



## Muting

This function allows access for parts or objects to enter a hazardous area without stopping the machine. However, if a person enters the dangerous zone, the machinery will stop.



Power isolators



Trapped key switches




E-stops





Non-contact switches


# PRESENCE SENSING SAFETY DEVICES


Learn more about  
[Allen-Bradley Guardmaster safety products](#)


**GuardShield 450L-B** 


	Description
	<ul style="list-style-type: none"> <li>• ON/OFF functionality</li> <li>• Transmitter or receiver via innovative plug-in modules</li> <li>• Active protective field over the entire length of a transceiver</li> <li>• Compact design 30 mm x 30 mm (1.18 in. x 1.18 in.)</li> <li>• Operating range: up to 7.0 m (22.97 ft)</li> <li>• Protection heights 150...1950 mm (5.9...76.7 in.) in increments of 150 mm (0.5 ft)</li> <li>• Finger 14 mm (0.55 in.) or hand 30 mm (1.18 in.) detection</li> <li>• Start mode, external device monitoring (EDM), scanning range are configured easily by DIP switches</li> <li>• IP65 enclosure rating</li> </ul>


**GuardShield 450L-E** 


	Description
	<ul style="list-style-type: none"> <li>• Advanced features and functionality                             <ul style="list-style-type: none"> <li>– Cascading, built-in muting and blanking, start mode, external device monitoring (EDM)</li> </ul> </li> <li>• Enhanced Integrated Laser Alignment System (ILAS)</li> <li>• Transmit or receive via an innovative plug-in module</li> <li>• Active protective field over the entire length of a transceiver</li> <li>• Compact design 30 mm x 30 mm (1.18 in. x 1.18 in.)</li> <li>• Operating range: up to 16.2 m (53.15 ft)</li> <li>• Finger 14 mm (0.55 in.) or hand 30 mm (1.18 in.) detection</li> <li>• IP65 standard</li> <li>• Flexible mounting options</li> </ul>


**Micro 400 with MSR41 or MSR42 controller** 


	Description
	<ul style="list-style-type: none"> <li>• Slim (15 mm x 20 mm) (0.59 in. x 0.78 in.) profile</li> <li>• ON/OFF (MSR41) or advanced functions (MSR42) controller</li> <li>• Cascadeable</li> <li>• Range: 5 m (16.4 ft)</li> <li>• Finger 14 mm (0.55 in.) or hand 30 mm (1.18 in.) detection</li> <li>• M12 QD connectors on 20 inch integrated cable</li> <li>• IP54 standard /IP69K option</li> </ul>


**GuardShield 440L Type 4** 


	Description
	<ul style="list-style-type: none"> <li>• Advanced features and functionality                             <ul style="list-style-type: none"> <li>- Fixed and floating blanking, EDM (External Device Monitoring), beam coding, Start/Restart interlock</li> </ul> </li> <li>• Range: 16 m (52.5 ft)</li> <li>• Integrated laser alignment options</li> <li>• Auxiliary output</li> <li>• Finger 14 mm (0.55 in.) or hand 30 mm (1.18 in.) detection</li> <li>• Cascadeable</li> <li>• M12 QD connectors</li> <li>• IP65 standard/IP67 kits available</li> </ul>

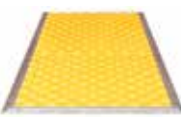
**GuardShield 440L Type4 PAC** 


	Description
	<ul style="list-style-type: none"> <li>• 2-beam with 500 mm (19.68 in.) and 3-beam with 400 mm (15.74 in.) spacing</li> <li>• Range: 16 m (52.49 ft)</li> <li>• Integrated laser alignment and DeviceNet safe connectivity options</li> <li>• Beam coding</li> <li>• External Device Monitoring (EDM)</li> <li>• Start/Restart interlock</li> <li>• Auxiliary output</li> </ul>


**445L Safe4 PAC** 


	Description
	<ul style="list-style-type: none"> <li>• ON/OFF functionality standard</li> <li>• 2-beam, 3-beam and 4-beam options</li> <li>• Range: 30 m (98.42 ft)</li> <li>• Integrated laser alignment system</li> <li>• M12 QD connectors</li> </ul>


**MatGuard™ Safety Mats** 

	Description
	<ul style="list-style-type: none"> <li>• Specially hardened steel plate construction</li> <li>• Active sensing over entire mat surface</li> <li>• Four-wire system for fault detection</li> <li>• Minimum detection weight of 66 lbs. (29.9 Kg)</li> <li>• Variety of aluminum trim options</li> <li>• Special sizes and shapes are possible</li> <li>• IP67</li> </ul>

**Safedge™ Safety Edges** 


	Description
	<ul style="list-style-type: none"> <li>• Conductive rubber profiles</li> <li>• 5 mm, 19 mm or 41 mm (0.19 in., 0.74 in. or 1.61 in.) cushion factors available</li> <li>• 50 m (164.04 ft) maximum lengths</li> <li>• Variety of profile shapes</li> <li>• IP65</li> </ul>


**Area Access Control Single Beam (AAC)** 

	Description
	<ul style="list-style-type: none"> <li>• ON/OFF functionality</li> <li>• Short range 20 m (65.61 ft) or long range 70 m (229.65 ft) options</li> <li>• Whole body detection</li> <li>• Heated front lens</li> <li>• PG 13.5 cable gland connection</li> <li>• IP65/IP67</li> </ul>

**SafeZone™ Safety Laser Scanners** 

	Description
	<ul style="list-style-type: none"> <li>• 190° or 270° scan angle</li> <li>• Safety field range: 2 m (6.56 ft), 3 m (9.8 ft), 4 m (13.12 ft) or 5 m (16.4 ft)</li> <li>• Configurable resolutions, 30 mm to 150 mm (1.18 in. to 5.9 in.)</li> <li>• Multiple sampling (2 to 16 scans)</li> <li>• Configurable restart delay</li> <li>• Horizontal or vertical mounting</li> <li>• Seven segment display for diagnostic information</li> <li>• IP65</li> </ul>

**SC300 Hand Detection Safety Sensor** 

	Description
	<ul style="list-style-type: none"> <li>• ON/OFF functionality</li> <li>• EDM, restart interlock functionality</li> <li>• Fits openings up to 1.5 m X 1.5 m (4.92 ft x 4.92 ft)</li> <li>• 24 mm or 30 mm (0.94 in. or 1.18 in.) resolution tape kits</li> <li>• Vertical or horizontal mounting</li> <li>• IP54</li> </ul>



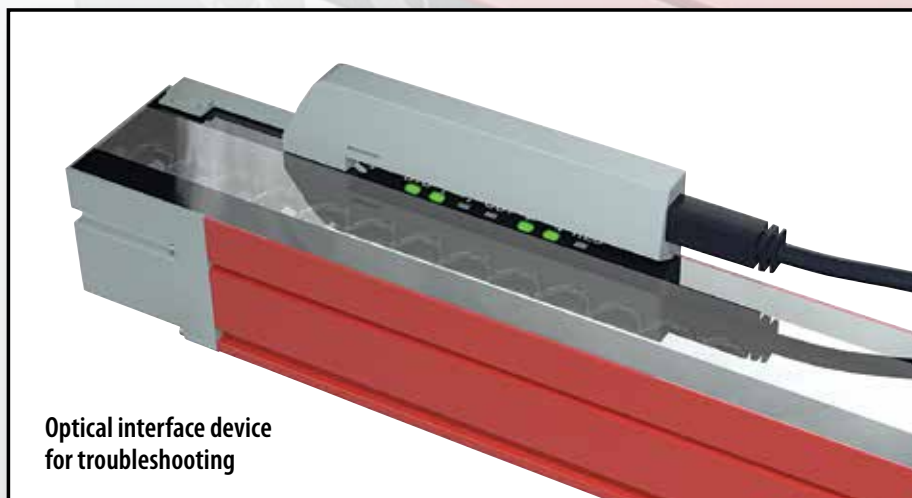
# PRODUCT SPOTLIGHTS

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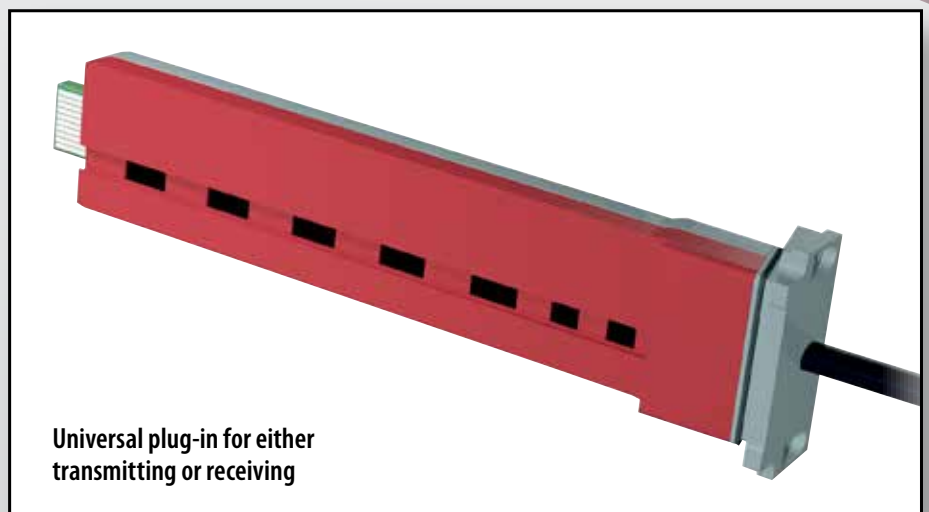
## **GuardShield 450L-B and GuardShield 450L-E Safety Light Curtains**

### **Point of Operation Control (POC) for finger or hand protection**

Allen-Bradley® GuardShield POC safety light curtains are unlike traditional safety light curtains, which are based on separate transmitter and receiver units. Patented technology allows each transceiver to be used as a transmitter or receiver via an innovative plug-in module. The 450L-B is the basic model with on/off functionality. The advanced 450L-E model features integrated laser alignment, cascading, blanking and integrated muting. Both are TÜV certified Plc, Type 4 IEC 61496-1/-2, SILcl3 per EN ISO 13849-1 and IEC 62061.



**Optical interface device  
for troubleshooting**



**Universal plug-in for either  
transmitting or receiving**



### GuardLink™ Technology

GuardLink is a safety-based communications protocol that links safety to The Connected Enterprise. Allen-Bradley Guardmaster smart safety devices featuring GuardLink technology deliver information, advanced functionality and flexibility, while enhancing safety and increasing efficiency machine- and plant-wide. GuardLink enabled devices offer advanced features and diagnostics that can only be accessed through a GuardLink connection tap.

### GuardLink provides access to diagnostic data when the safety function occurs

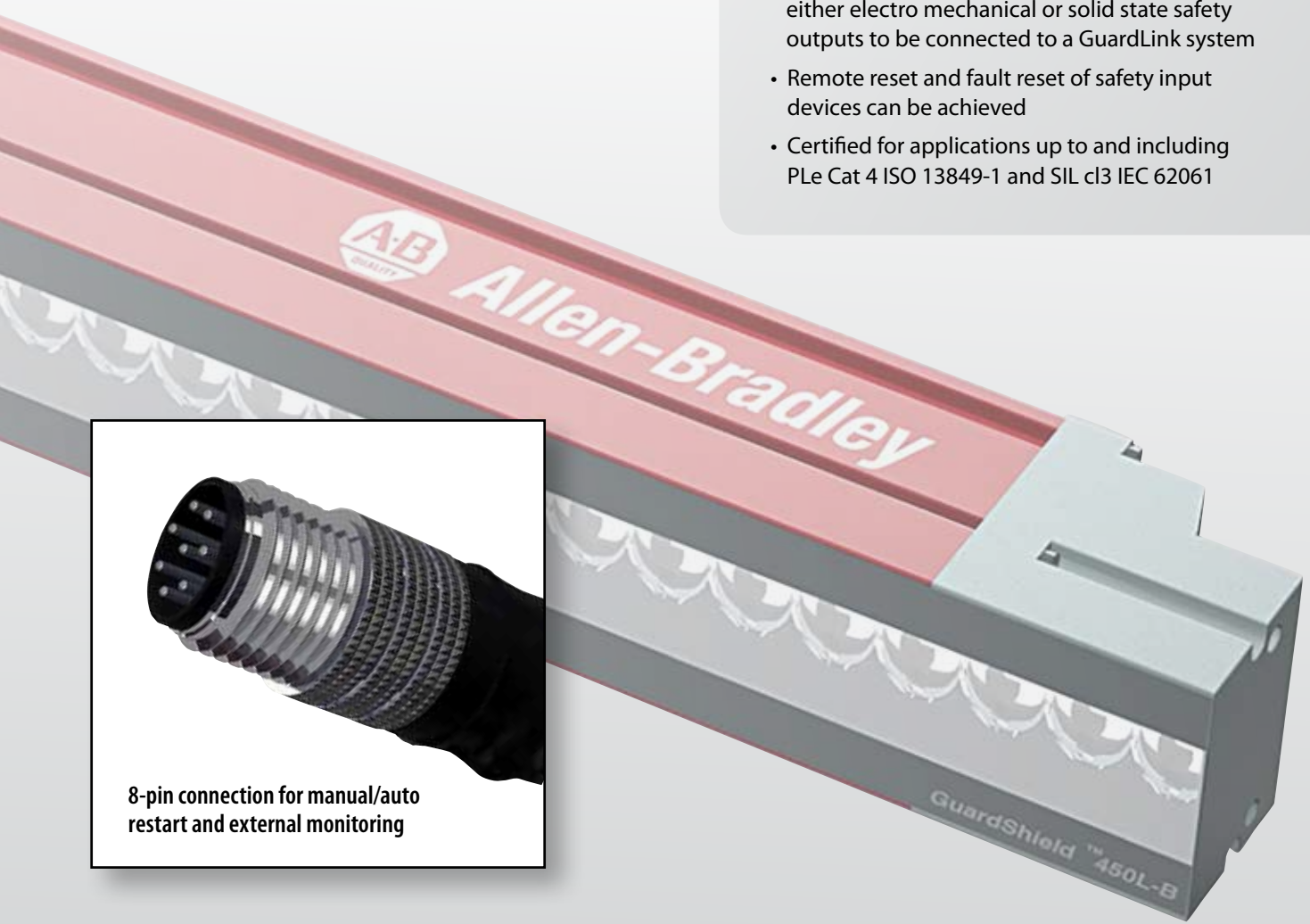
- No configuration is required, with wiring achieved through the use of multi-core cabling with M12 connectors
- A maximum of 32 safety input devices can be connected in series over 1000 m
- The Smart Taps allow safety input devices with either electro mechanical or solid state safety outputs to be connected to a GuardLink system
- Remote reset and fault reset of safety input devices can be achieved
- Certified for applications up to and including PLe Cat 4 ISO 13849-1 and SIL cl3 IEC 62061

### GuardShield 450L-B

- Innovative plug-in modules (available separately) for application flexibility and reduced inventory costs
- Protection heights 150...1950 mm (5.9...76.7 in.) in increments of 150 mm (0.5 ft)
- Compact design 30 mm x 30 mm (1.18 in. x 1.18 in.)







### GuardShield 450L-E

- Innovative plug-in modules (available separately) enable functionality for muting and blanking
- Cascading plug-ins for serial connection of safety light curtains
- Protective height is equal to mechanical length (full active design)
- Integrated laser alignment system helps provide quick and more reliable installation



8-pin connection for manual/auto restart and external monitoring

# PRESENCE SENSING SAFETY ACCESSORIES

		GuardShield 450L-B	GuardShield 450L-E	GuardShield 440L Type4	Micro 400 with MSR41 Controller	Micro 400 with MSR42 Controller	GuardShield 440L Type4 PAC	GuardShield 445L Safe 4 PAC	Area Access Control (AAC) Single Beam
<b>Corner Mirrors</b> <i>Offer multi-sided guarding</i>		•	•	•	•	•	•	•	•
<b>Washdown Enclosures</b> <i>Environmentally protective enclosures</i>				•	•	•	•		
<b>Weld Shields</b> <i>Protection for front window</i>		•	•	•			•		
<b>Optical Interface</b> <i>Provides fast diagnostic with CCW</i>		•	•						
<b>Shock Mounts</b> <i>Protect internal optical and electronic components</i>		•	•	•			•	•	
<b>Mounting Stand</b>		•	•	•	•	•	•	•	•

Rockwell Automation offers a breadth of quality Allen-Bradley products to fit your specific needs. In order to assist you with your product selection, we offer a variety of configuration and selection tools.



#### Rockwell Automation Online Product Directory

Our extensive product portfolio is designed to improve your processes through every stage of your manufacturing cycle. <http://www.rockwellautomation.com/products/>



#### Essential Components Selection Guide

Within this catalog you'll find an extensive selection of your Allen-Bradley safety products.

[http://literature.rockwellautomation.com/idc/groups/literature/documents/ca/ec-ca100\\_-en-p.pdf](http://literature.rockwellautomation.com/idc/groups/literature/documents/ca/ec-ca100_-en-p.pdf)



#### Product Selection Toolbox

Our powerful range of product selection and system configuration tools assist you in choosing and applying our products. <https://www.rockwellautomation.com/global/support/product-selection-configuration/overview.page?>



#### SISTEMA

SISTEMA Product Library is available to download to aid in safety performance level calculations.

<http://discover.rockwellautomation.com/>

SISTEMA software tool: Available for free download on BGIA website.

<http://www.dguv.de/bgia/en/prs/softwa/sistema/index.jsp>

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