

Installation Instructions

Original Instructions



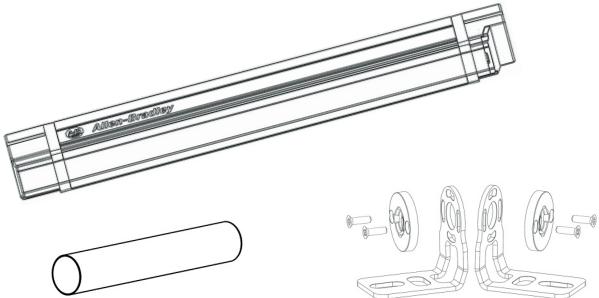
Allen-Bradley
by ROCKWELL AUTOMATION

GuardMaster®

GuardShield 450L PAC Safety Light Curtain

Catalog Numbers 450L-E4A1L0150YD, 450L-E4A2L0600YD, 450L-E4A3L0900YD, 450L-E4A4L1050YD

Figure 1 - Package Content (Stick, Mounting Brackets, and Test Rod)



IMPORTANT See [450L-UM001](#) in [Additional Resource on page 4](#) for in-depth instructions and technical information.

Figure 2 - Remove Red Slot Cover

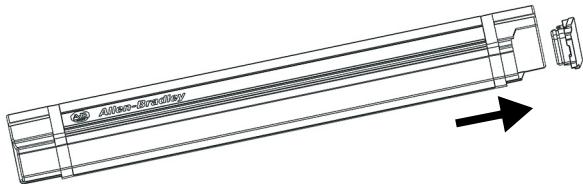
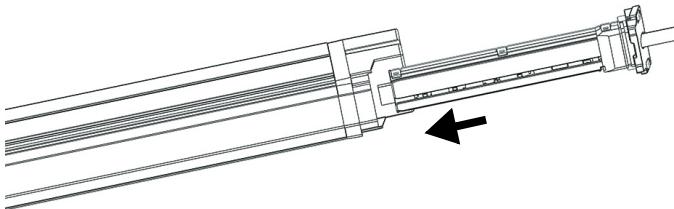


Figure 3 - Check DIP Switches on Connection Plug-in



Figure 4 - Insert Plug-in



If a 450L PAC safety light curtain is used and operated with a cascading plug-in, remove the gray slot cover insert and mount the cascading plug-in, similar to the connection plug-in.

IMPORTANT The plug-in must be ordered and supplied separately.

Figure 5 - Tighten Screws (0.38 N·m [3.36 lb·in], Max)

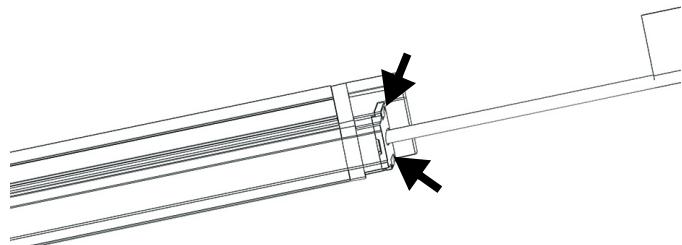
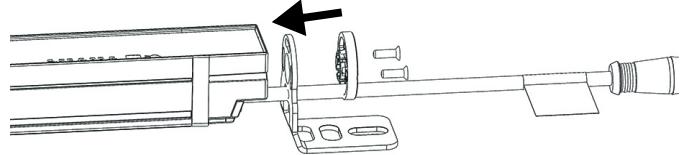


Figure 6 - Install Mounting Kit (0.7 N·m [6.19 lb·in], Max)



Confirm that both connection plug-ins are at the same end of the light curtain sticks.

Figure 7 - Position of Transmitter and Receiver Sticks

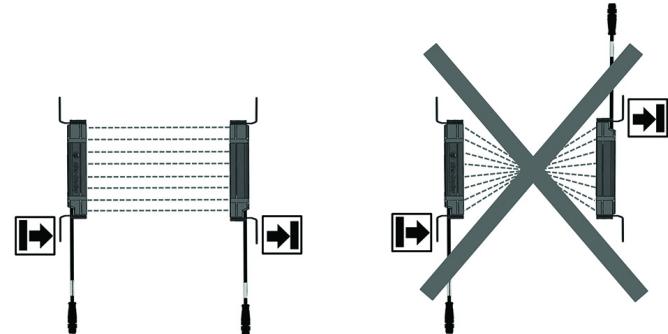
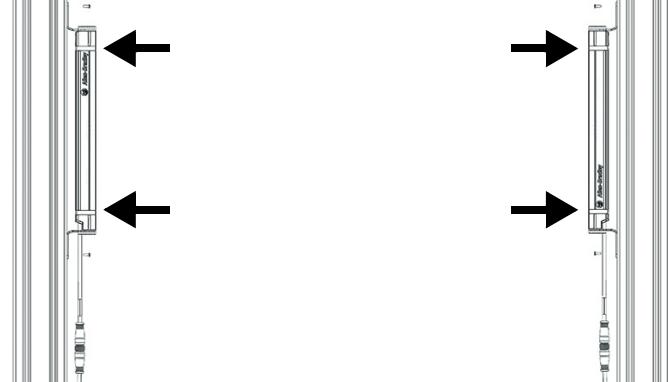
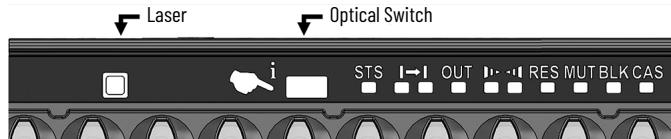


Figure 8 - Install, Connect, Power-up, and Align Complete System

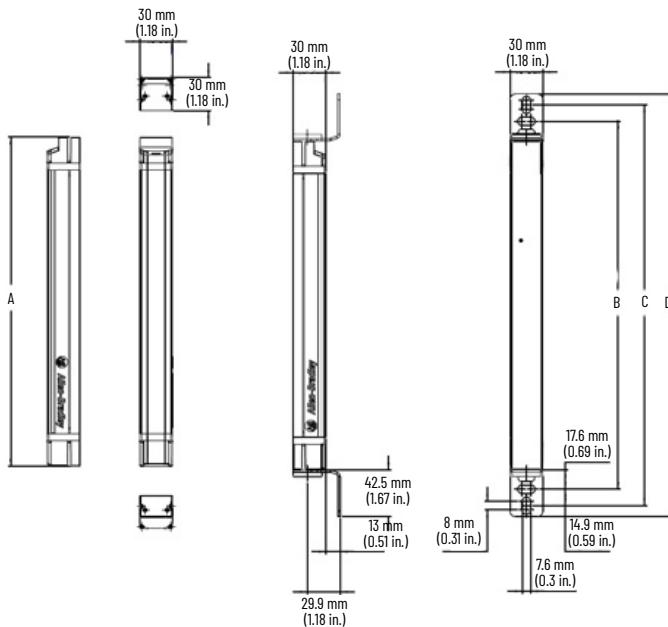


The 450L PAC safety light curtain sticks have an integrated laser alignment system. This system can be switched on/off by placing a finger on the optical switch, which is the square next to the hand symbol on the front window.

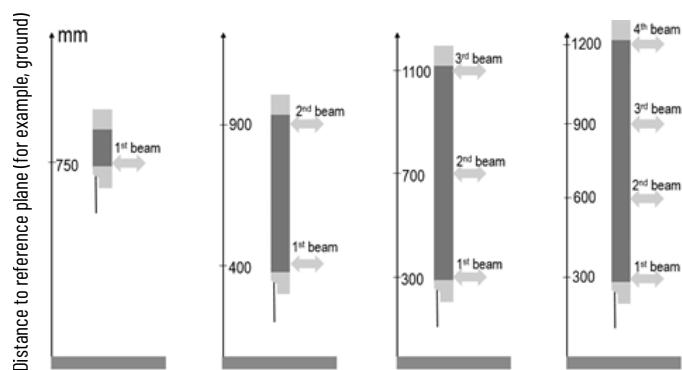
Figure 9 - Use the Integrated Laser Alignment System for Positioning

ATTENTION: Do not stare into the beam. Laser Class 2.
Conforms to 21 CFR 1040.10.

The 450L PAC is a Perimeter Access Control safety light curtain that is designed for whole body detection to create a safety perimeter around a machine or hazardous location. To verify correct operation, first place the machine or hazardous location in a safe state. Then interrupt the beams, refer to [Figure 11](#) for the beam positions of different models. Confirm that the OSSD safety output switches to the OFF state (refer to [Table 2 on page 3](#) for the indicator status) and remains OFF for as long as the beams are interrupted.

Figure 10 - 450L PAC Overall and Mounting Dimensions

Cat. No.	Number of Beams	A Protective Height	B Mounting Value	C Mounting Value	D Total Length
450L-E4A1L0150YD	1	150 mm (5.91 in.)	185.5 mm (7.3 in.)	215 mm (8.46 in.)	235 mm (9.25 in.)
450L-E4A2L0600YD	2	600 mm (23.62 in.)	635.5 mm (25.02 in.)	665 mm (26.18 in.)	685 mm (26.97 in.)
450L-E4A3L0900YD	3	900 mm (35.43 in.)	935.5 mm (36.83 in.)	965 mm (37.99 in.)	985 mm (38.78 in.)
450L-E4A4L1050YD	4	1050 mm (41.34 in.)	1085.5 mm (42.74 in.)	1115 mm (43.9 in.)	1135 mm (44.68 in.)

Figure 11 - 450L PAC Beam Heights**Table 1 - DIP Switch Functionality**

450L-APR-ON-5: DIP 1...4
450L-APR-EDM-8: DIP 1...8

50L-APU-UN-8: DIP 1...12
450L-APR-MU-8: DIP 1...12

Switch Number	Switch Function	Default	Description
1	—	OFF	—
2	Low range activation	OFF	OFF: Disabled ON: Enabled
3	Beam coding	OFF	OFF: Disabled ON: Enabled
4	—	OFF	OFF: Disabled ON: Invalid selection (error)
5	Combination activation of the following start modes: Automatic start Manual (re) start Manual cold start Manual start with off function	OFF	DIP 5: OFF DIP 6: OFF Automatic start (Default) DIP 5: ON DIP 6: OFF
6		OFF	Manual (re) start DIP 5: OFF DIP 6: ON Manual cold start DIP 5: ON DIP 6: ON Manual start with off function DIP 5: ON DIP 6: OFF
7	External Device Monitor	OFF	—
8	Muting	OFF	For details, see publication 450L-UM001 in Additional Resource on page 4
9		OFF	
10		OFF	
11		OFF	
12	—	OFF	—

Table 2 – Status Indicators on a 450L PAC GuardShield Light Curtain (Colors and Functions) for Normal Operation

No.	Marking	Status Indicator Name	Color	Behavior	Description
1	STS	Status indicator	Green	On	Power on and system is OK
			Green	Blinking	Configuration that is changed or receiver was operated previously with another transmitter (see 450L-UM001 in Additional Resource on page 4)
			Green	Off	See Troubleshooting in 450L-UM001 in Additional Resource on page 4
			Off	Blinking	
2	▶	Transmitter	Green	On	Plug-in identifies stick as a transmitter
				Blinking 1 Hz (50:50)	See Troubleshooting in 450L-UM001 in Additional Resource on page 4
				Blinking 1 Hz (98:2)	Reduced range and/or beam coding is activated
				Off	Stick is receiver
3	▶	Receiver	Green	On	Plug-in identifies stick as a receiver
				Blinking 1 Hz (98:2)	Reduced range and/or beam coding is activated
				—	Stick is transmitter
4	OUT	Safety outputs	Green	On	Safety outputs are on (receiver)
			Red	On	Safety outputs are off (receiver)
			—	Off	Transmitter
5		Regional light intensity level 1	Green	On	Bottom half zone is not interrupted, and intensity is OK
				Blinking 1 Hz (50:50)	Bottom half zone intensity is at the limit
				—	Bottom half zone interrupted
6		Regional light intensity level 2	Green	On	Top half zone is not interrupted, and intensity is OK
				Blinking 1 Hz (50:50)	Top half zone intensity is at the limit
				—	Top half zone interrupted
7	RES	Start	Amber	On	Start required (receiver)
			—	Off	No start is required (receiver)
8	MUT	Muting	Orange	Off	Light curtain that is not muted
				On	Light curtain that is muted
			Orange Off	Blinking	Muting error
9	BLK	Blanking (not supported on 450L PAC)	— —	—	—
			— —	—	—
			— —	—	—
10	CAS	Cascading	Red	Off	No cascading plug-in that is inserted or Tx OSSDs of connected cascade are in ON state (Rx only)
				On	OSSDs of connected cascade are in OFF state (Rx only)
			Red Off	Blinking	Error cascading plug-in



ATTENTION: A 450L GuardShield™ safety light curtain system is intended to be part of the safety-related control system of a machine. Before installation, perform a thorough risk assessment to determine whether the specifications of this device are suitable for all foreseeable operational and environmental characteristics of the application.

The following applications and/or environmental conditions can lead to misuse and potentially cause severe injuries or death (for more information see IEC 62046):

- Machines that eject materials, swarf, or component parts
- Risk of injury from thermal or other radiation
- Unacceptable noise levels
- Transparent objects are detected
- An environment that exceeds the specification limits provided in publication 450L-UM001.

Some but not all possible limits are electrostatic discharge, radio frequency interference, vibration/shock, ambient light, pollution, temperature, and humidity.

Without additional measures (IEC 62998), 450L-PAC GuardShield safety light curtains are not designed to be used in the following applications:

- Outdoors
- Under water
- Explosive atmospheres
- Altitudes over 3000 m (1.86 miles) above sea level
- With enhanced ionizing or radar radiation



ATTENTION: The protective system must be tested for proper operation after each change to the configuration. The 450L GuardShield safety light curtain cannot be used with machines that cannot be stopped electrically in an emergency. Always maintain the required safety distance (see publication [450L-UM001](#) in [Additional Resource on page 4](#)) between the 450L GuardShield safety light curtain and a dangerous machine movement. Additional mechanical protective devices have to be installed if hazardous machine elements can be reached without passing through the protective field. Improper installation can result in serious injury or death. Never connect the safety outputs (OSSDs) to +24V DC. The Auxiliary output is only a status output for diagnosis purposes, for example, to connect an indicator lamp. Do not connect this output to fulfill safety functions. If the safety outputs are connected to +24V DC, they are in the ON state and cannot stop hazardous machine/application movements. Do not open or attempt to repair or modify the 450L safety light curtain. Removal of either of the gray safety light curtain end caps or the transparent front window voids the warranty terms of this product. Do not insert or remove plug-ins when power is applied to the plug-in. Make sure that the power supply is protected against overload (fuse with 3 A in the 24V DC circuit). Installation must be in accordance with the publication [450L-UM001](#) in [Additional Resource on page 4](#) and implemented by qualified personnel exclusively.

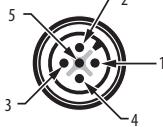
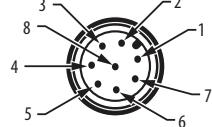
Damage occurs to the light curtain when screws are overtightened. To avoid pollution or contamination, the installation of a plug-in into a stick must be implemented in a dry and clean area. Make sure that the rubber seal at the plug-in does not get out of place when the plug-in is inserted in the light curtain.

CE Marking and EC Conformity

The present product complies with the requirements of the current European and national directives: 2006/42/EC (Machinery); 2014/30/EU (EMC); 2011/65/EU (ROHS) Conformity has been verified. The corresponding declaration can be downloaded at [rok.auto/certifications](#). Rockwell Automation B.V.; Rivium Promenade 160; 2909 LM Capelle aan den IJssel; The Netherlands.

Table 3 - Pin Assignment Connection Plug-in

For cascading plug-in (catalog number 450L-APC-IO-8, see publication [450L-UM001](#)).

Plug Type						
Stick Behavior	Tx ⁽¹⁾	Rx ⁽¹⁾	Tx ⁽¹⁾	Rx ⁽¹⁾	Tx ⁽¹⁾	Rx ⁽¹⁾
Plug-in Cat. No.	450L-APT-PW-5	450L-APR-ON-5	450L-APT-PW-8	450L-APR-ED-8 ⁽²⁾ 450L-APR-MU-8 ⁽³⁾	450L-APU-UN-8	
Pin 1	+24V DC	+24V DC	Do not connect	Auxiliary output (OSSD emulation) ⁽²⁾	Do not connect	Auxiliary output (OSSD emulation)
Pin 2	Do not connect	OSSD1	+24V DC	+24V DC	+24V DC	+24V DC
Pin 3	0V (Ground)	0V (GND)	Earth PE	Earth PE	Earth PE	Earth PE
Pin 4	Do not connect	OSSD2	Do not connect	EDM (Input) ⁽²⁾	(4)	EDM input ⁽³⁾
Pin 5	Earth PE	Earth PE	Do not connect	OSSD1	Do not connect	OSSD1
Pin 6	-	-	Auxiliary output (Lockout)	OSSD2	Auxiliary output (Lockout)	OSSD2
Pin 7			0V (GND)	0V (GND)	0V (GND)	0V (GND)
Pin 8	-	-	Do not connect	Start ⁽²⁾	(4)	Start ⁽²⁾

(1) Tx=Transmitter, Rx=Receiver

(2) If set with DIP switches.

(3) For muting applications, see publication [450L-UM001](#) in [Additional Resource](#).

(4) Pin 4 connected to pin 8 (short circuited).

Additional Resource

To download publications, visit [rok.auto/literature](#) and search for the following publication numbers.

Resource	Description
GuardShield Safety Light Curtain User Manual, publication 450L-UM001	Provides product-specific guidelines for installing the 450L-B and 450L-E POC and 450L-PAC safety light curtain systems.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

Waste Electrical and Electronic Equipment (WEEE)



At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental compliance information on its website at [rok.auto/pec](#).

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