

Installation Instructions

Original Instructions



Allen-Bradley
by ROCKWELL AUTOMATION



GuardShield Safety Light Curtain

Catalog Numbers 450L-B4FNxYD, 450L-B4HNxYD, 450L-E4FLxYD, 450L-E4HLxYD

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

Installation must be in accordance with the publication [450L-UM001](#) and implemented by qualified personnel exclusively.



WARNING: 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, humidity.

The 450L GuardShield safety light curtain cannot be used with machines that cannot be stopped electrically in an emergency.

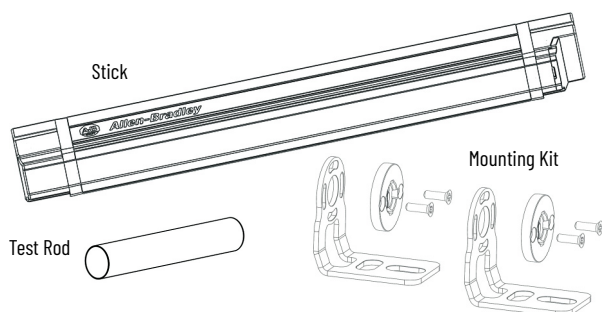


ATTENTION: Without additional measures (IEC 62998), GuardShield 450L-B safety light curtains are not designed to be used for the following applications:

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

The protective system must be tested for proper operation after each change to the configuration.

Figure 1 - Package Content



Installation



ATTENTION: This package content is intended for replacement cases. For new product installation, see publication [450L-UM001](#).

Figure 2 - Remove Red Slot Cover

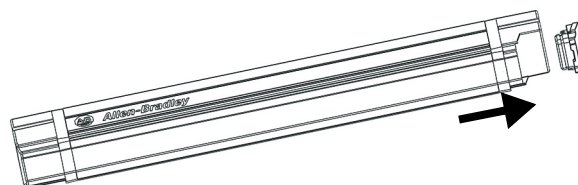
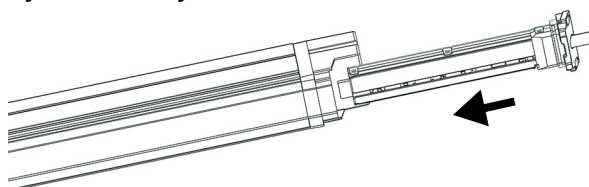


Figure 3 - Check DIP Switches on Connection Plug-in



Figure 4 - Insert Plug-in



If a 450L-E 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.



ATTENTION: Do not insert or remove plug-ins when power is applied to the plug-in.

Figure 5 - Tighten Screws

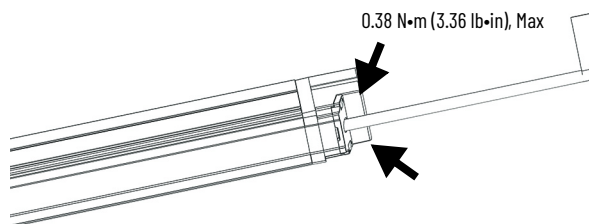
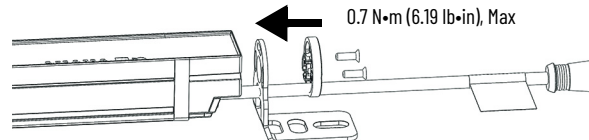


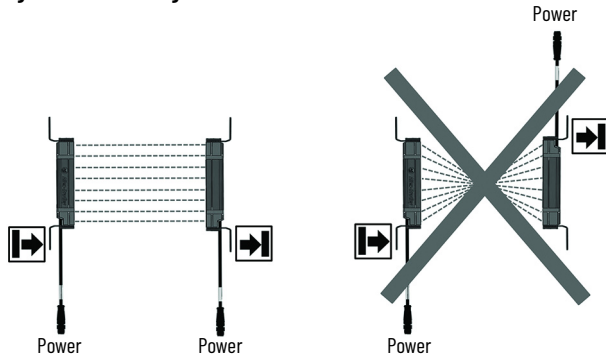
Figure 6 - Install Mounting Kit





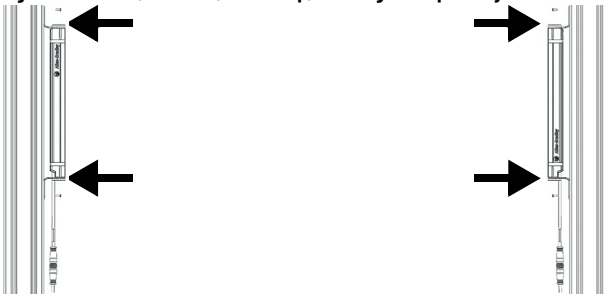
ATTENTION: Damage occurs to the safety light curtain when screws are overtightened. To avoid pollution or contamination, the implement the installation of a plug-in into a stick in a dry and clean area. Verify that the rubber seal at the plug-in does not shift out of place when the plug-in is inserted in the safety light curtain.

Figure 7 - Positioning of Transmitter and Receiver Sticks



Confirm that both connection plug-ins are at the same end of the installation.

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



The 450L-E safety light curtain sticks have an integrated laser alignment system. Place a finger on the optical switch (the square next to the hand symbol on the front window) to switch the alignment system on and off.

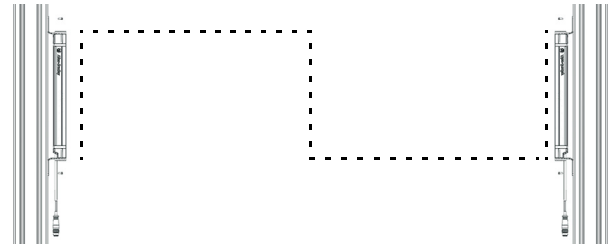
Figure 9 - Use the Integrated Laser Alignment System for Positioning



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

For 450L-B safety light curtain sticks, an optional laser alignment tool (catalog number 440L-ALAT) and clamp (catalog number 450L-ALAT-C) are available.

Figure 10 - Test Resolution with Test Rod



Verify that while the test rod is anywhere within the protective field, the OSSD safety outputs remain in the off-state. Move the test rod as indicated in [Figure 10](#) with a maximum speed of 0.3 m/s (11.8 in/s). Be sure that the intensity indicator indicates a continuous protective field interruption (minimum one intensity indicator is off).



ATTENTION: Always maintain the required safety distance (see publication [450L-UM001](#)) between the 450L GuardShield safety light curtain and a dangerous machine movement. Additional mechanical protective devices must 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 to connect, for example, 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 GuardShield safety light curtain. Removal of either of the gray GuardShield end caps or the transparent front window voids the warranty terms of this product.

Verify that the power supply is protected against overload (fuse with 3 A in the 24V DC circuit).

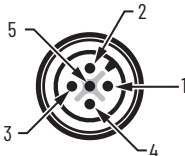
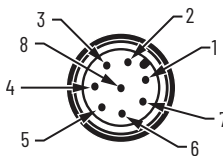
Table 1 - 450L Safety Light Curtain Status Indicators for Normal Operation

Marking	Status Indicator Name	Color		Behavior	Description
STS	Status indicator	Green		On	Power on and system is OK
		Green	Red	Blinking	Configuration that is changed or receiver was operated previously with another transmitter. See publication 450L-UM001 .
		Green	Off	Blinking (98:2)	Interference rejection is enabled
		Green	Red	Blinking (90:10)	Optical interference is detected (this status is indicated even if interference rejection is already enabled)
		Green	Off	Blinking	See publication 450L-UM001
		Off	Red	Blinking	
		Red	On		
	Transmitter	Green	On	Plug-in identifies stick as a transmitter	
			Blinking 1 Hz (50:50)	See publication 450L-UM001	
			Blinking 1 Hz (98:2)	Reduced range is activated	
			Off	Stick is receiver	
	Receiver	Green	On	Plug-in identifies the stick as a receiver	
			Blinking 1 Hz (98:2)	Reduced range is activated	
			Off	Stick is transmitter	
			Off	Stick is receiver	
OUT	Safety outputs	Green	On	Safety outputs are on (receiver)	
		Red	On	Safety outputs are off (receiver)	
			Off	Transmitter	
	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	
			Off	Bottom half zone interrupted	
	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	
			Off	Top half zone interrupted	
RES	Start	Amber	On	Start required (receiver)	
			Off	No start is required (receiver)	
MUT	Muting	Orange	Off	Light curtain not muted	MUT
			On	Light curtain muted	
			Blinking	Muting error	
BLK	Blanking	Orange	Off	No blanking feature selected	BLK
			On	Blanking feature selected	
			Blinking	Blanking error	
CAS	Cascading	Red	Off	No cascading plug-in inserted or Tx or OSSDs of connected cascade are in on-state (Rx only)	CAS
			On	OSSDs of connected cascade are in off-state (Rx only)	
			Blinking	Plug-in cascade error	

Table 2 - DIP Switch Functionality

450L-APR-ON-5:	DIP 1...4	450L-APR-BL-8:	DIP 1..8
450L-APR-EDM-8:	DIP 1..8	450L-APR-MU-8:	DIP 1..12
450L-APU-UN-8:	DIP 1..12		
Switch Number	Switch Function	Default	Description
1	—	Off	—
2	Low range activation	Off	Off: Disabled On: Enabled
3	Beam coding (450L-E only)	Off	Off: Disabled On: Enabled
4	Interference rejection (450L-E only)	Off	Off: Disabled On: Enabled
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: Manual (re) start DIP 5: Off, DIP 6 On: Manual cold start
6		Off	DIP 5: On, DIP 6 On: Manual start with off function
7	External device monitor	Off	Off: Disabled On: Enabled
8	Muting or blanking (450L-E only)	Off	—
9		Off	For details, see publication 450L-UM001
10		Off	
11		Off	
12	—	Off	—

Table 3 - Pin Assignment Connection Plug-in ⁽¹⁾

						
	Plug-type	Tx ⁽²⁾	Rx ⁽³⁾	Tx ⁽²⁾	Rx ⁽³⁾	Tx ⁽²⁾
Pin	450L-APT-PW-5	450L-APR-ON-5 450L-APR-BL-5	450L-APT-PW-8	450L-APR-ED-8 ⁽⁴⁾ 450L-APR-MU-8 ⁽³⁾	450L-APU-UN-8	
1	+24V DC	+24V DC	Do not connect	Auxiliary output (OSSD emulation) ⁽⁴⁾	Do not connect	Auxiliary output (OSSD emulation)
2	Do not connect	OSSD1	+24V DC	+24V DC	+24V DC	+24V DC
3	0V (ground)	0V (GND)	Earth PE	Earth PE	Earth PE	Earth PE
4	Do not connect	OSSD2	Do not connect	EDM (input) ⁽¹⁾	⁽⁵⁾	EDM (input) ⁽⁶⁾
5	Earth PE	Earth PE	Do not connect	OSSD1	Do not connect	OSSD1
6	—	—	Auxiliary output (lockout)	OSSD2	Auxiliary output (lockout)	OSSD2
7			0V (GND)	0V (GND)	0V (GND)	0V (GND)
8			Do not connect	Start ⁽⁴⁾	⁽⁵⁾	Start ⁽⁴⁾

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

(2) Tx=Transmitter

(3) Rx=Receiver

(4) If set with DIP switches.

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

(6) For muting applications, see publication [450L-UM001](#).

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.

Additional Resources

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 Rockwell Automation® 450L-B and 450L-E safety light curtain system.
450L GuardShield Safety Light Curtain Quick Start, publication 450L-QS001	Provides a summary of the basic steps that are required to configure and run a system using 450L light curtains.
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](#).

Your comments help us serve your documentation needs better. If you have any suggestions on how to improve our content, complete the form at [rok.auto/docfeedback](#).

For technical support, visit [rok.auto/support](#).

Rockwell Otomasyon Ticaret A.Ş. Kar Plaza İş Merkezi E Blok Kat:6 34752, İçerenköy, İstanbul, Tel: +90 (216) 5698400 EEE Yönetmeliğine Uygundur

Connect with us.    

rockwellautomation.com — expanding human possibility®

AMERICAS: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

EUROPE/MIDDLE EAST/AFRICA: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640

ASIA PACIFIC: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

UNITED KINGDOM: Rockwell Automation Ltd. Pitfield, Kiln Farm Milton Keynes, MK11 3DR, United Kingdom, Tel: (44)(1908) 838-800, Fax: (44)(1908) 261-917

Allen-Bradley, expanding human possibility, Guardmaster, GuardShield, and Rockwell Automation are trademarks of Rockwell Automation, Inc.

Trademarks not belonging to Rockwell Automation are property of their respective companies.

Publication 450L-IN004B-EN-P - March 2022 | Supersedes Publication 450L-IN004A-EN-P - December 2017

Copyright © 2022 Rockwell Automation, Inc. All rights reserved. Printed in the U.S.A.

PN-306702
10001601201 Ver 02