

# Installation Instructions

## 45DLA Discrete Light Array

**IMPORTANT: SAVE THESE INSTRUCTIONS FOR FUTURE USE.**

### Description

The Allen-Bradley 45DLA Discrete Light Array is an ON/OFF sensor that utilizes an array of transmitted beam photoelectric sensor pairs to detect objects over a much wider span than traditional sensors. The controls are integrated into the array housing and no separate controller is required. The emitter and receiver are optically synchronized and therefore do not need to be wired together. The 45DLA are packaged as transmitted beam pairs—the emitter and receiver arrays are both included.

### Features

- Integrated light array controller
- IP54
- Simple, flexible mounting
- Optically synchronized—no electrical connection between emitter and receiver required
- Push/pull (PNP/NPN) outputs—connect to sinking or sourcing inputs
- Wiring selectable range and output state (light or dark operate)
- 30 mm resolution
- Sensing height of 118...734 mm (4.6...28.9 in.)
- Packaged as transmitted beam pair (both emitter and receiver arrays included)

### Specifications

<b>Environmental</b>	
Certifications	cULus and CE Marked for all applicable directives
Operating Environment	IP54
Operating Temperature [C (F)]	-20...+55° (-4...+131°)
Vibration	2 g, 10...200 Hz; 20 sweeps each axis; meets or exceeds EN 60068-2-6
Shock	15 g, 11 ms, 3 x each axis; 10 g, 16 ms, 100 x each axis; meets or exceeds EN 60068-2-27 and EN 60068-2-29
Relative Humidity	5...95% (noncondensing)
Ambient Light Immunity	75,000 lux
<b>Optical</b>	
Sensing Modes	Transmitted beam pair
Sensing Range	200...1500 mm (7.9...59 in.) or 1000...8000 mm (39...315 in.)
Field of View	Emitter (long range selected): 15° @ 3.0 m (9.8 ft) Receiver (when emitter has long range selected): 35° @ 3.0 m (9.8 ft)
Light Source	Infrared LED (880 nm)
LED Indicators	Green (transmitter only) = Power, Orange (receiver only) = Target present
Adjustments	Selectable range (by wiring input)
Resolution	30 mm (1.2 in.)
Beam Pitch	22 mm (0.87 in.)
<b>Electrical</b>	
Voltage	14...30V DC
Current Consumption	Typ. 50 mA @ 24V DC without load connected
Sensor Protection	Short circuit (SCP), reverse polarity
Inrush Current (during power up)	< 2 A per array 10 ms
<b>Electrical</b>	
Response Time	25...165 ms by cat. no.
Power-On Time	100 ms + response time
Output Type	PNP/NPN (single push/pull output)
Output Mode	Dark or light operate selectable (by wiring)
Output Current	120 mA max.
<b>Mechanical</b>	
Housing Material	Aluminum
Lens Material	Polycarbonate
Cable Material	PVC
Connection Type	4-pin DC micro (M12) on 150 mm (6 in.) cable pigtail

### ATTENTION



These devices are intended for object recognition only and may not be used for protection of humans (access protection).

## Product Specifications

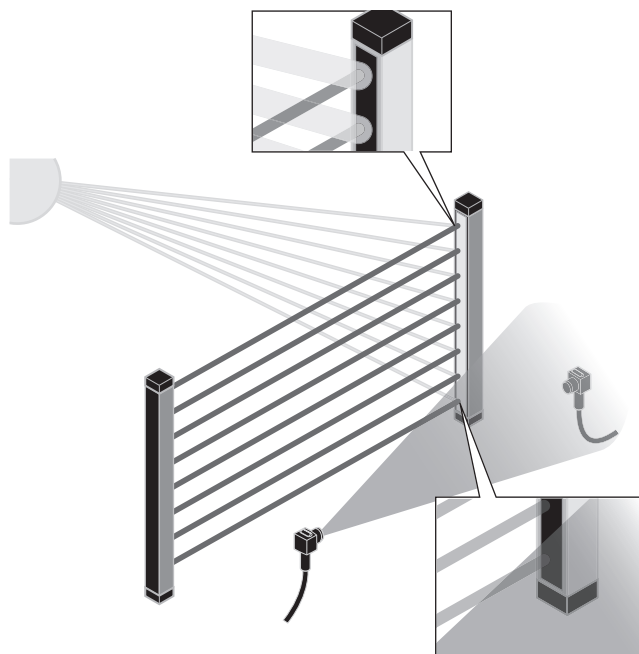
No. of Beams	Sensing Height [mm (in.)]	Response Time [ms]	Dimension [mm]	Cat. No.
4	118 (4.65)	25	12x16x266	45DLA-1LEB1T-F4
8	206 (8.11)	45	12x16x354	45DLA-1LEB2T-F4
16	382 (15.04)	85	12x16x530	45DLA-1LEB4T-F4
24	558 (21.97)	125	12x16x706	45DLA-1LEB6T-F4
32	734 (28.9)	165	12x16x882	45DLA-1LEB8T-F4

**Note:** The 45DLA is packaged as a transmitted beam pair—both the emitter and receiver arrays are included. The “T” in the cat. no. represents the transmitted beam pair. For individual parts, the “T” is replaced with an “E” for emitter or “R” for receiver, for example, 45DLA-1LEB1R-F4.

LED	Description	Color	Meaning
Emitter Array	Emitter Status	Off	No Power
		Green	Power OK
Receiver Array	Receiver Status	Off	No power or target not present
		Orange	Power OK and target present

## Mounting Instructions

1. The emitter and the receiver housing can be mounted onto a surface through mounting holes provided on either the front or the side. To mount using the front holes, use M4 flat head (counter sunk) screws (included). To mount using side holes, use M4 pan head screws.
2. The photosensor elements are positioned behind the round black plastic lens elements visible on the surface of the extrusion on the “front” sides of the emitter and receiver. Align the emitter and receiver such that these elements are face-to-face with the corresponding elements on the other part.
3. Please note that the receiver can be sensitive to interference light. No other source of external light, including the emitters of any photoelectric sensor, array, or light curtain, should be directed towards the receiver housing. Although the 45DLA is very tolerant of bright sunlight, it is better practice to mount the receiver housing such that no sun light shines directly into the curved front area of the receiver lens.



### ATTENTION



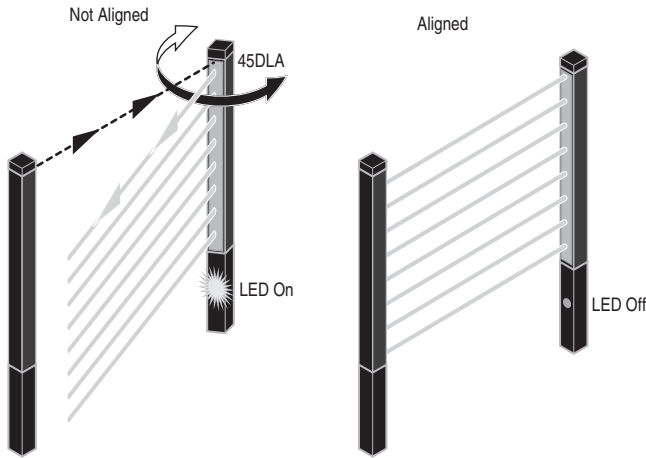
Turn power off before starting installation.

## Alignment

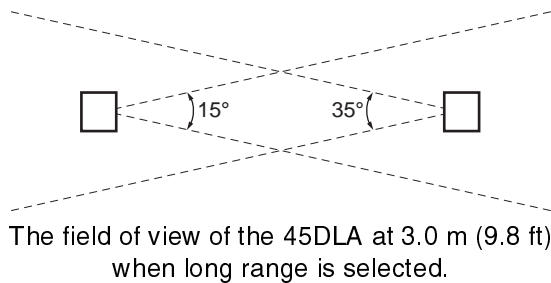
This is a crucial step in the setup since sensor operation is dependent on correct alignment of the source and receiver. This process is simplified by using the orange LEDs on the receiver units to serve as an indication of proper alignment.

1. Aim the receiver 90° away from the light source and verify that the orange LED on the receiver is On (confirming that the unit has power and that it does not detect light from the emitter).

- Now, slowly rotate the receiver to face the transmitter. The orange LED should turn Off as this is done. Note the point at which this happens.
- Continue to rotate the receiver away from the transmitter until it is 180° from the starting point. The orange LED should turn On as this is done. Note the point at which the orange LED turns On.
- To be certain the beam is centered, set the beam halfway between the two points at which the LED transitions state.

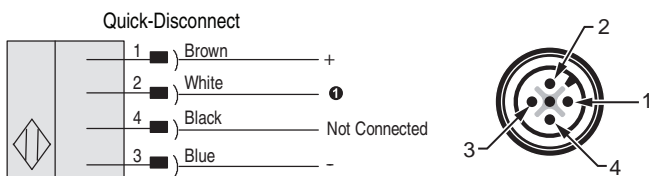


- Repeat this process in the vertical plane.



## Wiring Diagram

### Emitter



- Pin 2 (white wire) range selection: Connect to 0V or not connected for 1000...8000 mm (39...315 in.); connect to V+ (24V) for 200...1500 mm (7.9...59 in.).

**Note:** Black = N.C. (Not Connected)

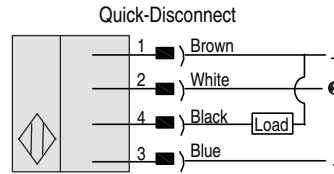
**Note:** In applications with multiple 45DLA pairs, it is recommended to use the shorter range option to reduce the potential for interference between separate pairs.

**Note:** For applications with a range of less than 1 m (3.3 ft), it is recommended to use the shorter range option to improve the response time.

### Receiver

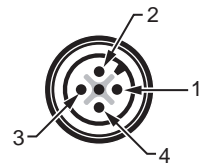
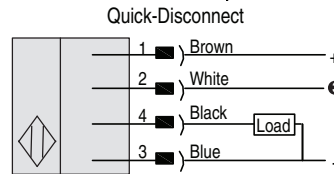
The 45DLA uses a Push/Pull transistor output that can be wired as either a PNP or NPN style output.

Wired as NPN output:



- Pin 2 (white wire): Connect to V+ (24V) or not connected for D.O.; connect to 0V for L.O.

Wired as PNP output:



- Pin 2 (white wire): Connect to V+ (24V) or not connected for L.O.; connect to 0V for D.O.

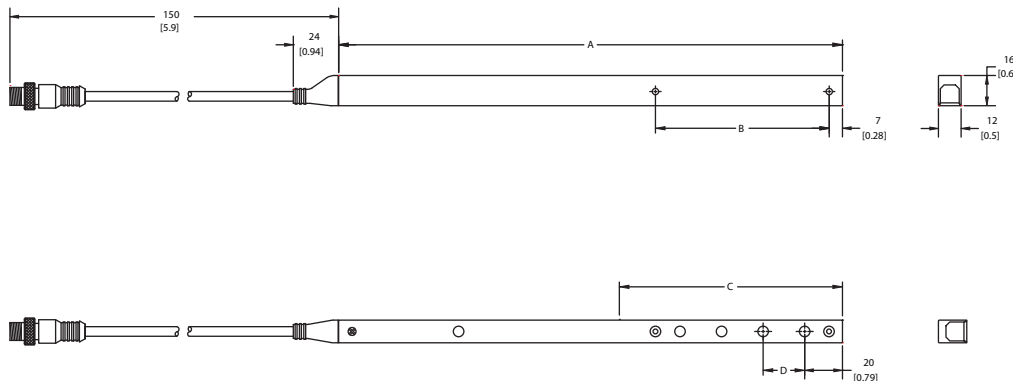
## Troubleshooting

If the 45DLA does not operate as expected, follow this trouble shooting guide step by step:

- Power-up light array system (emitter and receiver arrays).
- Check supply voltage both on emitter and receiver.
  - Is the green indicator LED on the emitter array On?
  - Is the orange LED on the receiver array On when the beams are blocked (or if the receiver is not aligned with the emitter)?
- Is the supply voltage between 14...30 Volts DC? The ripple on the DC voltage should not exceed more than 10% of the mean voltage within the min. and max. range.
- Check whether the application at hand requires light-operate or dark-operate settings, and verify that the sensor is connected accordingly.
  - In case of an NPN output: connect the white wire to V+ (24V) or not connected for D.O.; connect to 0V L.O.
  - In case of a PNP output: connect the white wire to V+ (24V) or not connected for L.O.; connect to 0V D.O.
  - See figure in wiring diagram.
- If the output signal of the receiver is not stable when there isn't an obstacle between the emitter and receiver, perform the following checks:
  - Is there excessive EMI-noise being generated by a drive or electrical installation in the vicinity of the parts? In such a case, move the cable of the receiver so that the distance to the noise source is as wide as possible.

- b. Are the arrays properly installed and aligned? Ensure that the installation is sturdy and does not allow the parts to swing or vibrate, and therefore lose line of sight to each other.
- c. Are the optical elements of the arrays clean and not obscured by dust or dirt? Although the 45DLA is tolerant of dust and dirt, the performance is much better when it is clean.
- d. Are there any other sensors in the vicinity emitting infrared light towards the receiver array?

**Dimensions [mm (in.)]**



No. of Beams	Dimensions [mm (in.)]				Cat. No.
	A: Housing Height	B: Mounting Holes	C: Sensing Height	D: Pitch	
4	266 (10.5)	92 (3.6)	118 (4.65)	22 (0.87)	45DLA-1LEB1T-F4
8	354 (13.9)	180 (7.1)	206 (8.11)	22 (0.87)	45DLA-1LEB2T-F4
16	530 (20.9)	356 (14.0)	382 (15.04)	22 (0.87)	45DLA-1LEB4T-F4
24	706 (27.8)	532 (20.9)	558 (21.97)	22 (0.87)	45DLA-1LEB6T-F4
32	882 (34.7)	708 (27.9)	734 (28.9)	22 (0.87)	45DLA-1LEB8T-F4

**Accessories**

Description	Cat.No.
2 m (6.5 ft) DC micro QD cordset	889D-F4AC-2
2 m (6.5 ft) DC micro QD patchcord	889D-F4ACDM-2
DC micro splitter	879D-F4DM

**IMPORTANT** Do not use high pressure washdown or excessive water to clean the edges. Do not use solvents or mechanically abrasive materials to clean the edges.

**IMPORTANT** For use in NFPA 79 applications only.

[www.rockwellautomation.com](http://www.rockwellautomation.com)

**Power, Control and Information Solutions Headquarters**

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444  
 Europe/Middle East/Africa: Rockwell Automation, Vorstlaan/Boulevard du Souverain 36, 1170 Brussels, 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

10000035038  
 107 896  
 September 2009  
 Printed in Switzerland