

**45MLA****Measuring Arrays and Controllers****Description**

The Allen-Bradley 45MLA is a measurement sensor that utilizes an array of transmitted beam photoelectric sensor pairs to detect and measure objects. The array housing is extremely compact, allowing for easy installation in a range of applications.

The 45MLA are packaged as transmitted beam pairs—the emitter and receiver arrays are both included. The system requires an Allen-Bradley 45MLA controller, which must be ordered separately. Three versions of the controller (I/O, RS485, CAN) are available, each offering a different communications platform that can be selected to function with a range of PLCs.

The controller drives the photoelectric elements in the emitter and reads out the receiver beam information. Use of this external controller allows the flexibility to configure up to four separate sensing zones with independent outputs or the communication of individual beam status via serial protocols. Additionally, the 45MLA can also be customized for application specific overhang and over-height detection.

**Features**

- Height measuring capability
- Slim profile array housing
- Long operating range—4 m (13 ft)
- Fast reaction time and measurement speed
- Individual beam status available via controller (serial communication models only)

**Specifications**

Environmental	45MLA Arrays	45MLA Controller
Certifications	CE Marked for all applicable directives	
Operating Environment	IP54	Housing IP54, terminal strip IP20
Operating Temperature [C (F)]	0...55° (32...131°)	
Storage Temperature [C (F)]	-20...70° (-4...158°)	-25...70° (-13...158°)
Vibration	10...55 Hz; amplitude 0.35 mm (0.01 in.); meets or exceeds IEC 60068-2-6	
Shock	Acceleration 10 g, pulse duration 16 ms, 10...55 Hz; amplitude 0.35 mm (0.01 in.); meets or exceeds IEC 60068-2-29	
Relative Humidity	15...95%	15...95%
<b>Optical</b>		
Sensing modes	Transmitted beam pair	—
Sensing Range	0...4 m (0...13 ft)	—
Field of View	3.2°	—
Light Source	940 nm	—
Beam Spacing	10 mm (0.4 in.) or 25 mm (1.0 in.)	—
Resolution	18 mm (0.7 in.) or 33 mm (1.3 in.)	—
LED Indicators	Red: Status Green: Alignment	Alignment, target present, outputs, inputs, power
<b>Electrical</b>		
Voltage	Provided by controller	20.4...27.6V DC ±5% max. ripple
Current Consumption	—	<300 mA with max. no. of beams to controller, outputs not connected
Sensor Protection	EN61000-4-2, EN 61000-4-4 and EN 61000-4-5; short circuit (SCP), reverse polarity, and overload	
<b>Outputs</b>		
Response Time	See <i>45MLA Controller User Manual</i>	
Output Type	—	NPN and PNP (push/pull output)
Output Mode	—	Dark operate (when connected as PNP)
Output Current	—	150 mA max. each
<b>Mechanical</b>		
Housing Material	Aluminum	ABS(FR) UL94-V0
Lens Material	Polycarbonate	—
Cover Material	Aluminum	Polycarbonate
Connection Types	8-pin DC micro (M12) female QD on 500 mm (20 in.) cable pigtail—controller connection only	Spring loaded terminal connections
Supplied Accessories	Adjustable mounting kit (445L-AF6143)	
Required Accessories	Controller 45MLA controller I/O model Cat. No. 45MLA-CTRL 45MLA controller RS45 Cat. No.: 45MLA-CTRL-485 45MLA controller CAN Cat. No. 45MLA-CTRL-CAN Light array to controller connecting cable 3 m (9.8 ft) M12—RJ45 Cat. No. 445L-AC8RJ3 5 m (16.4 ft) M12—RJ45 Cat. No. 445L-AC8RJ5 8 m (26.2 ft) M12—RJ45 Cat. No. 445L-AC8RJ8 Max. system length cannot exceed 10 m (32.8 ft)	
Optional Accessories	Flat mounting kit Cat. No. 445L-AF6145	

**User Interface**

The following table indicates LED status and descriptions for LEDs on the emitter and receiver light arrays.

Location	LED	Description	Status	Meaning
Emitter and Receiver Arrays	Green	Light array alignment	Off	Arrays not aligned (or target present)
			On	Arrays aligned (and target not present)
			Flashing	Low margin/light intensity inadequate
	Red	Light array status	Off	Target not present (and arrays aligned)
			On	Target present (or arrays not aligned)

The following table indicates the status and description for each LED on the controller's main PCB.

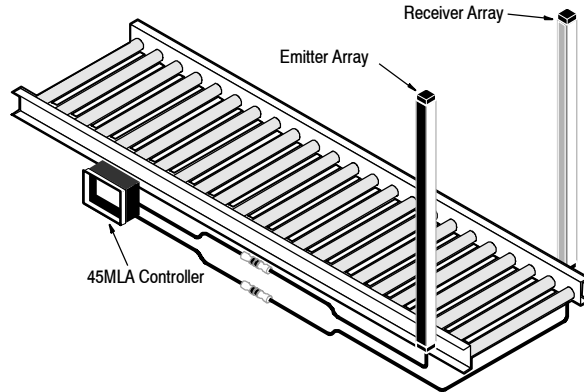
LED	Description	Color	Meaning
D1	Light Array OK	Off	Target present or light arrays not aligned
		Green	Target not present and light arrays aligned
		Green flashing	Low margin/light intensity inadequate
D2	Light array status	Off	Target not present
		Red	Target present
		Red Flashing	Height Measurement Error
D3	Out1	Off	Output 1 inactive
		Green	Output 1 active
D4	Out2	Off	Output 2 inactive
		Green	Output 2 active
D5	In1	Off	Input 1 inactive
		Green	Input 1 active
D6	In2	Off	Input 2 inactive
		Green	Input 2 active
D7	Power	Off	Power off
		Green	Power on

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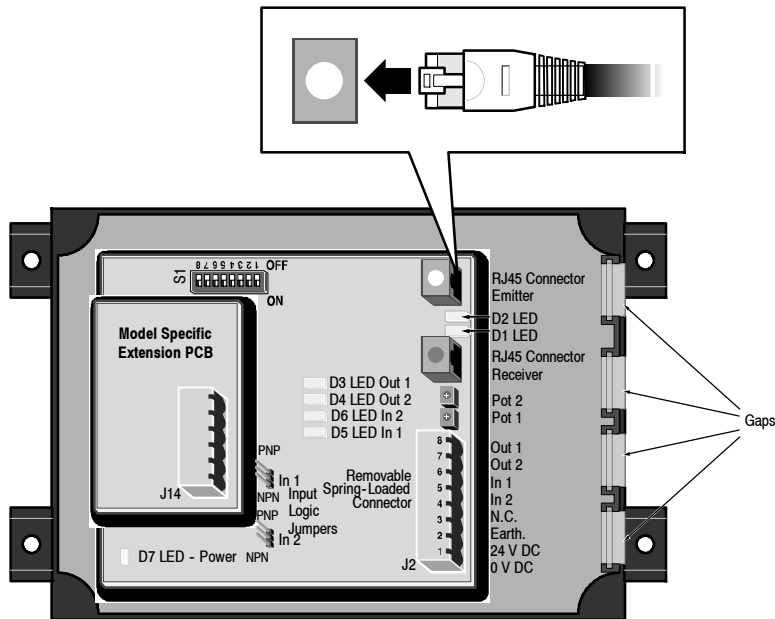
## Measuring Arrays and Controllers

### Wiring Diagrams

The 45MLA is a "Three Box System." Every setup consists of an emitter array, a receiver array, and an external controller.



Each controller has the same base PCB and a pre-installed extension PCB with model-specific functionality and additional connections.



Connector J2 on the base PCB has the following pinout for all controller models.

Pin	Signal	Description
1	0V DC	Power
2	+24V DC	Power
3	Ground	Ground
4	Not connected	Not connected
5...8	Model specific functions (see below)	

Pins 5...8 on connector J2 (on the base PCB) have different functionality with each controller model. The following tables show the pin connections for each specific model.

**I/O Model**

Pin	Signal	Description	Remarks
5	In 2	Trigger and hold	DIP switch S1 (7) = 0
		Overhang back sensor	DIP switch S1 (7) = 1
6	In 1	Not used	DIP switch S1 (7) = 0
		Overhang front sensor	DIP switch S1 (7) = 1
7	Out 2	Light array interrupted❶	0 V DC = interrupted 24 V DC = not interrupted
8	Out 1	Overhang	0 V DC = overhang 24 V DC = no overhang

**RS485 and CAN models**

Pin	Signal	Description	Remarks
5	In 2	Trigger and hold	Special function
6	In 1	Not used	Not used
7	Out 2	Light interrupted❶	0V = interrupted
8	Out 1	Overhang	0V = overhang

❶ Or over-height (special function)

The extension PCB has connections specific to the functionality of each individual model. Here are the pin connections for each model. The connectors are labeled on the PCB.

**I/O Model  
Connector J14**

Pin	Signal	0V DC	+24V DC
1	Out 3	Zone Z1 interrupted	Zone Z1 not interrupted
2	Out 4	Zone Z2 interrupted	Zone Z2 not interrupted
3	Out 5	Zone Z3 interrupted	Zone Z3 not interrupted
4	Out 6	Zone Z4 interrupted	Zone Z4 not interrupted

**RS485 Model  
Connector J16**

Pin	2 Wire	4 Wire
1	0V DC	0V DC
2	—	Rx+
3	Shielding	Shielding
4	—	Rx-
5	B	Tx+
6	A	Tx-

**CAN Model  
Connectors J12 and J13 (RJ45)**

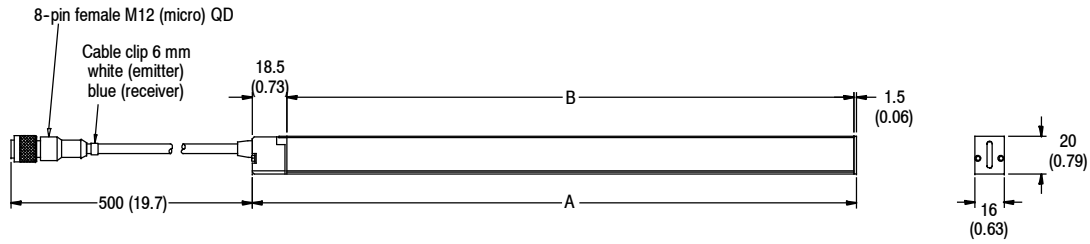
Pin	Signal
1	CAN H
2	CAN L
3	0V DC
4	Not connected
5	Not connected
6	Shield
7	0V DC
8	CAN V+

**45MLA**

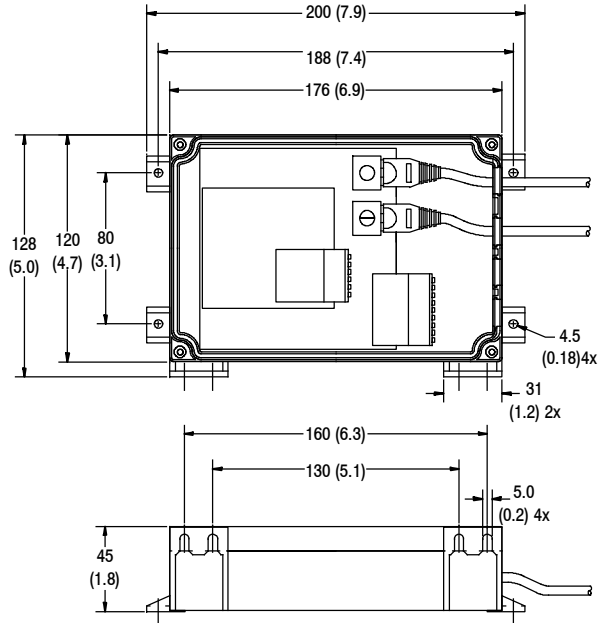
Measuring Arrays and Controllers

Approximate Dimensions [mm (in.)]

Arrays



Controller



**Note:** The controller can be mounted either on a DIN Rail using the mounting brackets on the back or with four screws through the holes on the tabs extending from the corners of the housing.

## Product Selection

## Arrays

No. of Beams	A Housing Height [mm (in.)]	B Sensing Height [mm (in.)]	Beam Spacing [mm (in.)]	Length x Width [mm (in.)]	Cat. No.
30	320 (12.6)	300 (11.8)	10 (0.39)	20 x 16 (0.79 x 0.62)	45MLA-AT0300P10
60	630 (24.4)	600 (23.6)	10 (0.39)	20 x 16 (0.79 x 0.62)	45MLA-AT0600P10
90	920 (36.2)	900 (35.4)	10 (0.39)	20 x 16 (0.79 x 0.62)	45MLA-AT0900P10
120	1220 (48.0)	1200 (47.2)	10 (0.39)	20 x 16 (0.79 x 0.62)	45MLA-AT1200P10
36	920 (36.2)	900 (35.4)	25 (0.98)	20 x 16 (0.79 x 0.62)	45MLA-AT0900P25
48	1220 (48.0)	1200 (47.2)	25 (0.98)	20 x 16 (0.79 x 0.62)	45MLA-AT1200P25

## Controllers

Description	Cat. No.
I/O Model	45MLA-CTRL
RS485	45MLA-CTRL-485
CAN	45MLA-CTRL-CAN

## Accessories

Description	Cat. No.
Flat mounting kit (four pieces/set)	445L-AF6145
180° adjustable mounting kit (four pieces/set, included with arrays)	445L-AF6143
Cable—Light array to controller	
3 m M12—RJ45	445L-AC8RJ3
5 m M12—RJ45	445L-AC8RJ5
8 m M12—RJ45	445L-AC8RJ8