

# Distance Measurement Sensor

Catalog Numbers 45DMS-B8LAT-D4, 45DMS-B8LGT1-D5



## Description

The distance measurement photoelectric sensor is a compact, time-of-flight sensor that is ideal for measurement applications in material handling and packaging environments. Background-suppression sensing modes are ideal for applications where highly reflective backgrounds must be ignored while helping to provide excellent reliability detection of targets within the specified range.

The distance measurement sensor also offers a background reflection (also known as foreground suppression) sensing mode that enables operators to use the surface of a background (for example, a conveyor) as a reflector. The detection of a target occurs once an object blocks the visual path between the sensor and the background (for example, a conveyor).

## Features

- 5 m (16.4 ft) sensing range to 90% white and 3 m (9.8 ft) sensing range for 6% black target
- 1 mm (0.04 in.) resolution via IO-Link™ and 5 mm (0.2 in.) resolution with 4...20 mA or 0...10V analog output
- ± 30 mm (1.18 in.) maximum linearity for distance measurement applications
- Eye Safe Class 1 Laser for ease of alignment and installation
- Distance measurement, background suppression, and background reflection sensing modes selectable using IO-Link™
- Discrete only, 4...20 mA and 0...10 V on analog with adjustable range using the push buttons

- Enhanced sensor diagnostics when using IO-Link 1.1 point-to-point protocol helps customers minimize machine downtime and increase productivity
- Additional virtual output when using IO-Link
- IP69K rated enclosure

## Sensor Configuration

The Bulletin 45DMS can be configured using the push button, remote teach, or IO-Link with the help of the status indicators on the sensor. The following sensor features can be configured:

- Teach sensing range: standard or precision teach
- Background suppression and background reflection (a.k.a. foreground suppression) sensing modes via IO-Link.
- Light Operate (L.O.) or Dark Operate (D.O.) output
- Auto PNP/NPN, dedicated NPN, or dedicated PNP
- Push button lock and unlock
- Change sensor output from 4...20 mA to 0...10V using IO-Link

**Table 1 - Factory Default Settings**

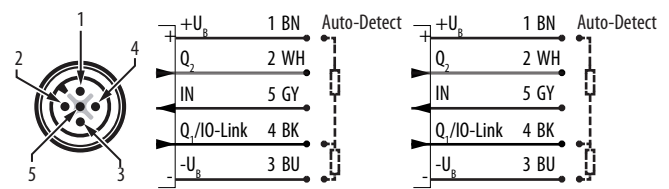
Description	45DMS-B8LAT1-D4	45DMS-B8LGT1-D5
Sensing range	5 m (16.4 ft) to 90% white 3 m (9.4 ft) to 6% black	Q <sub>A</sub> : 0.3...3 m (0.98...9.84 ft) Q: 0.3...3 m (0.98...9.84 ft)
Sensing mode	Background suppression (single point)	Background reflection (window)
Response time	2 ms	



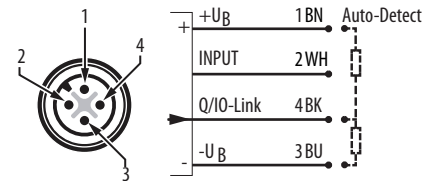
**Table 2 - Specifications**

<b>Attribute</b>	<b>45DMS-B8LAT1-D4, 45DMS-B8LGT1-D5</b>
Certifications	c-UL-us and CE marked for all applicable directives
Vibration	10...55 Hz, 1 mm (0.04 in.) amplitude, meets or exceeds 60947-5-2
Shock	30 g with 1 m (3.28 ft), meets or exceeds IEC 60947-5-2
Warm-up time	20 min.
<b>User Interface</b>	
Status indicators	Q: Green Discrete Output; Q <sub>A</sub> : Orange Output
<b>Optical</b>	
Sensing range	45DMS-B8LGT1-D5 – 0.1...5 m (0.33...16.4 ft) 45DMS-B8LAT1-D4 – 0.06...5 m (0.33...16.4 ft)
Resolution	Analog: Less than 5 mm (0.2 in.); IO-Link: 1.2 mm (0.05 in.)
Linearity	+/- 30 mm (1.18 in.)
Repeatability	1.2 mm (0.05 in.)
Hysteresis	20 mm (0.79 in.)
Laser type (IEC 60825-1)	Class 1 Eye Safe Laser
<b>Electrical</b>	
Adjustments	Teachable using push buttons or remote teach (5-pin models)
Voltage	18...30V DC
Current consumption	60 mA max.
Sensor protection	Reverse polarity and short circuit.
<b>Discrete Output</b>	
Response time	2 ms for both Q and Q <sub>A</sub>
Output type	Auto PNP or NPN on power-up
Load current	100 mA max
<b>Analog Output</b>	
Range	4...20 mA (default) or 0...10 V (configurable using IO-Link)
Update rate	2 ms
Load	Less than 500 Ohms (4...20 mA); More than 4k Ohm (0...10 V)
Temperature drift	Less than 2 mm (0.08 in.)/K
<b>IO-Link</b>	
Communications mode	COM2
Cycle time	2.7 ms, min
Process data bit length	24 bits (3 bytes)
Specifications	1.1
<b>Mechanical</b>	
Housing material	ABS
Lens material	PMMA
<b>Environmental</b>	
Enclosure type rating	IP67 and IP69K rated enclosure
Operating temperature	-40...+60 °C (-40...+140 °F)
Connection type	270° rotatable integral M12 QD

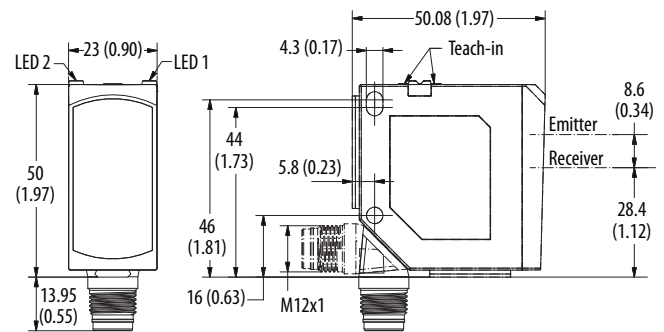
**Figure 1 - Micro (M12) Male QD Pigtail/Male QD (5-pin) Wiring Diagrams**



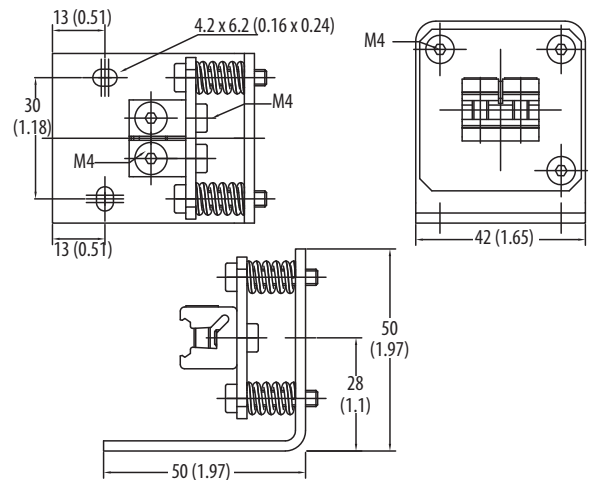
**Figure 2 - Micro (M12) Male QD Pigtail/Male QD (4-pin)**



**Figure 3 - Approximate Dimensions [mm (in.)]**

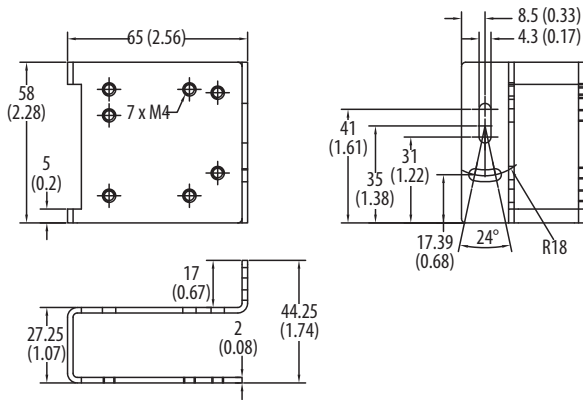


**Figure 4 - Precision Adjustment Stainless Steel Bracket (Cat. No. 60-BDMS-PS)**

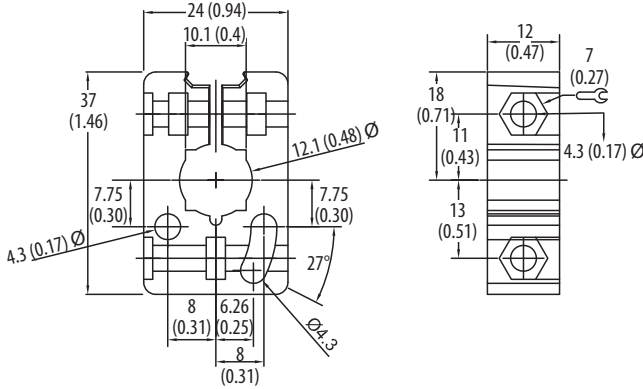


The quick-disconnect connector is shown [Figure 1](#). The pin numbers correspond to the male connectors on the sensor.

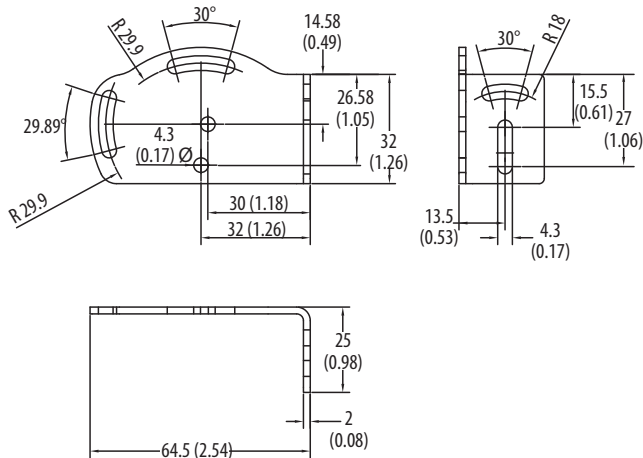
**Figure 5 - Protective Stainless Steel Mounting Bracket (Cat. No. 60-BDMS-US)**



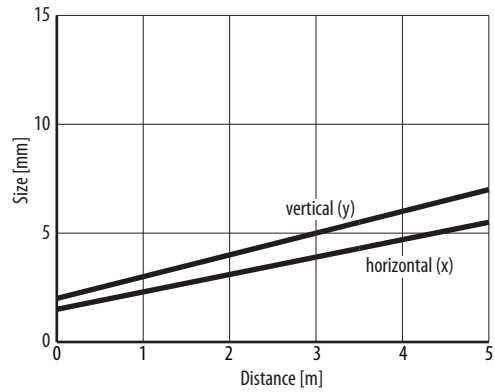
**Figure 6 - Mounting Rod Bracket (Cat. No. 60-BDMS-PS)**



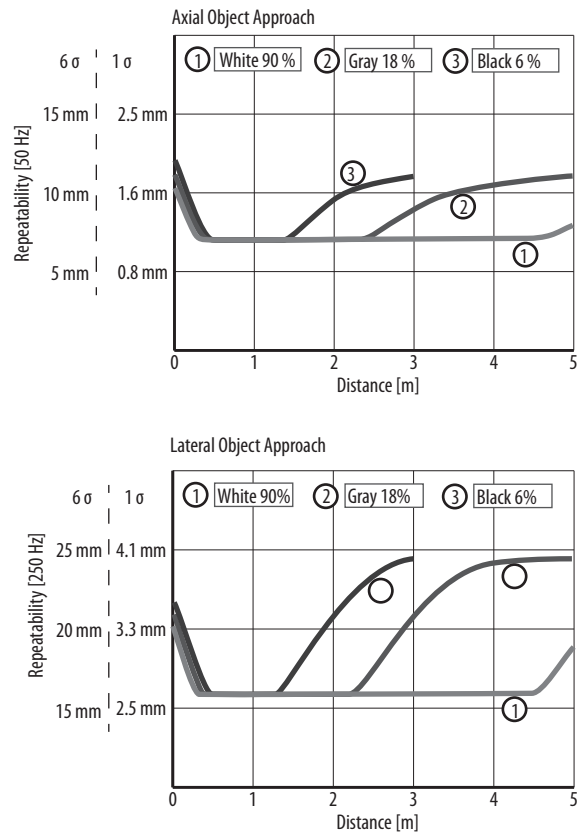
**Figure 7 - L-shaped Stainless Steel Bracket (Cat. No. 60-BDMS-LS)**



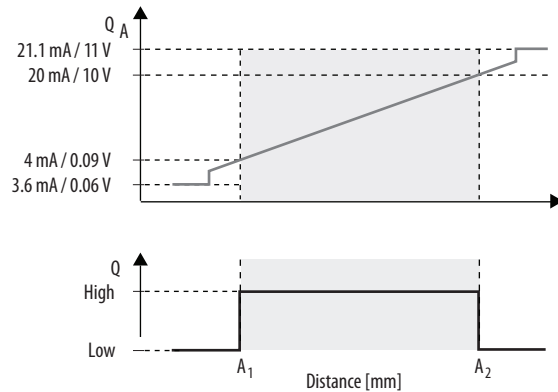
**Figure 8 - Light Spot Size Curve**



**Figure 9 - Sensor Repeatability Curve**



**Figure 10 - Characteristic Analog Curve**



# Rockwell Automation Support

## Rockwell Automation Support

Use the following resources to access support information.

<b>Technical Support Center</b>	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	<a href="http://www.rockwellautomation.com/knowledgebase">www.rockwellautomation.com/knowledgebase</a>
<b>Local Technical Support Phone Numbers</b>	Locate the phone number for your country.	<a href="http://www.rockwellautomation.com/global/support/get-support-now.page">www.rockwellautomation.com/global/support/get-support-now.page</a>
<b>Direct Dial Codes</b>	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	<a href="http://www.rockwellautomation.com/global/support/direct-dial.page">www.rockwellautomation.com/global/support/direct-dial.page</a>
<b>Literature Library</b>	Installation Instructions, Manuals, Brochures, and Technical Data.	<a href="http://www.rockwellautomation.com/literature">www.rockwellautomation.com/literature</a>
<b>Product Compatibility and Download Center (PCDC)</b>	Get help determining how products interact, check features and capabilities, and find associated firmware.	<a href="http://www.rockwellautomation.com/global/support/pcdc.page">www.rockwellautomation.com/global/support/pcdc.page</a>

## Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete the How Are We Doing? form at [http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002\\_-en-e.pdf](http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002_-en-e.pdf).

**Table 3 - Product Selection**

Sensing Mode	Light Source	Sensing Distance	Sensitivity Adjustment	Output Type	Cat. No.
Background Suppression	Class 1 Laser	0.06...5 m (0.2...16.4 ft) [90% white] 0.06...3 m (0.2...9.8 ft) [6% black]	One Push Button	Auto PNP or NPN	45DMS-B8LAT1-D4
Background Reflection		0.1...5 m (0.33...16.4 ft) [90% white] (0.1...3 m (0.33...9.8 ft) [6% black]	Two Push Button	Auto PNP or NPN and 4...20 mA	45DMS-B8LGT1-D5

**Table 4 - Accessories**

Description	Catalog Number
L-shaped stainless steel mounting bracket	60-BDMS-LS
Bracket for 12 mm diameter mounting rod and 10 x 10 mm square profile	60-BDMS-RS
Protective stainless steel mounting bracket	60-BDMS-US
Stainless steel precision mounting bracket	60-BDMS-PS
2 m 4-pin M12 QD cordset	889D-F4AC-2
2 m 5-pin M12 QD cordset	889D-F5AC-2

## Waste Electrical and Electronic Equipment (WEEE)



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

Rockwell Automation maintains current product environmental information on its website at <http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page>.

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