Installation Instructions

Original Instructions

Allen-Bradley
by ROCKWELL AUTOMATION

42JT VisiSight Background Suppression Photoelectric Sensor with IO-Link

Catalog Numbers 42JT-B2LAT1-*x*, 42JT-B2LAT2-*x*, 42JT-B8LAT1-*x*

IMPORTANT Save these instructions for future use.

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Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

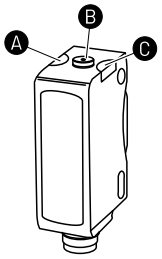
Topic	Page
Updated images throughout publication	Throughout
Updated catalog numbers	1
Added Static Teach heading	2
Updated instructions link in IO-Link section	3
Added Description of Laser Class section	6
Added Declaration of Conformity section	6

Default Settings

The factory default settings are as follows:

Attribute	Setting
Sensing Range	Maximum setting
Output Mode	Light operate (Output ON when target detected)
Output Type	Auto PNP/NPN or IO-Link. In Auto PNP/NPN mode, the sensor continuously monitors the load connection and automatically configures the output to PNP or NPN.

Sensor User Interface



Item	Description
A	Yellow status indicator
B	Push button
C	Green status indicator

Status Indicators

The following table provides the state of the status indicators in the RUN mode during operation. The sensor is always in RUN mode, except when being taught.

Table 1 - Auto PNP/NPN Operation

Color	State	Description
Green	OFF	Power is OFF
	ON	Power is ON
	Flashing (6 Hz)	Unstable light level (0.5 < margin < 2)
	Flashing (1.5 Hz)	Output short circuit protection active
Yellow	OFF	Output de-energized
	ON	Output energized

Table 2 - IO-Link Operation

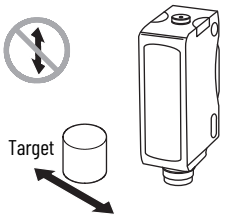
Color	State	Description
Green	OFF	Power is OFF
	Flashing (1 Hz)	Power is ON
Yellow	OFF	Output de-energized
	ON	Output energized

Rockwell Automation

IO-Link

Mount the Sensor

Securely mount the sensor on a firm, stable surface or support. An application subject to excessive vibration or shifting can cause intermittent operation. For installation convenience, we offer mounting brackets (see Accessories on page 3).



IMPORTANT Due to the detection method, targets that travel horizontally to the optics of the sensor are detected. Targets that travel vertically may not be accurately detected. For reliable background suppression, a minimum separation distance is recommended between the target and the background. However, this distance can vary depending on the application. See Typical Response Curves on page 3.

VisiSight Configuration

The 42JT VisiSight™ sensor is configured with the push button, Remote Teach, or via IO-Link and the status indicators on the sensor.

Four features can be configured:

- Standard or precision teach for sensitivity/sensing range
- Light operate (LO) or dark operate (DO) output
- Auto PNP/NPN, dedicated NPN, or dedicated PNP
- Push button lock/unlock

The sensor output is disabled during Teach.

Teach Sensitivity/Sensing Range

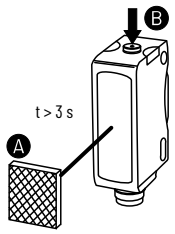
The default setting is the maximum sensitivity/range.

Static Teach

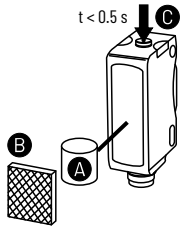
Teaching the sensitivity/sensing range is a two-step process. Teach the background (first condition) and teach target (second condition). Switching threshold for output ON vs. OFF is set in between the two conditions.

Standard Teach

1. Teach the background (first condition):
   a. Align the sensor to the background (A).
   b. Press and hold the button (B) for 3 seconds until yellow status indicator starts to flash.
   c. Release the button.
   The first condition has now been taught.



2. Teach the Target (second condition):
   a. Insert the target (A) between the sensor and the background (B).
   b. Press and release the button (C).
   The teach process is complete.



IMPORTANT With multiple reflectivity targets, choose the darkest/least reflective target and place it in its farthest position for setup.

If the button is not pressed within 30 seconds, the sensor exits teach mode and returns to RUN mode without learning the new setting.

If there is no background surface in the field of view in step 1, the switching threshold is set between the distance to the target and the maximum sensing range. The sensor can also be taught by teaching the target as the first condition and background as the second condition.

Precision Teach

For a more precise setting with a smaller hysteresis, teach the sensor to the target in step 1 and keep the target present in step 2).

Restore to Factory Default Setting of Maximum Range

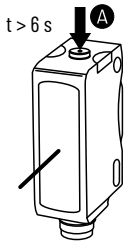
Perform step 1 and step 2 with no target in the field of view of the sensor and nothing in the background.

Teach Light Operate (LO) or Dark Operate (DO)

The default setting of the output is light operate (LO).

LO setting means that output turns ON when the target is detected. If the application requires the output to turn OFF when the target is detected, the setting may be changed to dark operate (DO).

1. To access the teach output mode setting:
   a. Press and hold the button (A) for 6 seconds until the green status indicator starts to flash.
   b. Release the button.
   The yellow status indicator indicates the current setting: LO — Yellow status indicator ON; DO — Yellow status indicator OFF



2. To change the sensor output mode setting:
   a. Press and release the button (A) within 10 seconds to toggle from LO to DO, the selection indicated by the yellow status indicator.

      The sensor retains the setting per the last press of the button and returns to the RUN mode ten seconds after the last press of the button.



Output Type Selection: Auto PNP/NPN, Dedicated NPN, Dedicated PNP

The default setting is Auto PNP/NPN. The sensor monitors the load connection and automatically configures for proper operation (that is, PNP or NPN). If no load is connected, the sensor defaults to PNP. The following applications are covered with dedicated PNP or dedicated NPN selection:

- Parallel wiring of multiple sensor outputs: select dedicated PNP or dedicated NPN setting, as needed.
- If the load is connected for NPN configuration but to a power supply other than that to the sensor or via a load enabling contact (for example, a relay contact in series with the load), select dedicated NPN.

Selection can be made as follows:

- Access output type: Press and hold the push button for 12 seconds (until both status indicators start to flash synchronously). When the push button is released, the slow flash of the status indicators indicates the current setting of output type as follows:
  - Auto PNP/NPN: Both status indicators flashing
  - Dedicated NPN: Green status indicator flashing
  - Dedicated PNP: Yellow status indicator flashing
- Change output type: Press and release the push button within 10 seconds to select desired type. Each button activation cycles to the next output setting. The status indicators indicate the type that is selected. The sensor retains the setting per the last press of the button and returns to the RUN mode 10 seconds after the last press of the button.

Push Button Lock/Unlock

The push button or remote teach (RT) can be used to help prevent unauthorized users from changing teach settings.

Lock/Unlock	Description
Lock the push button	Press and release the button three times within 3 seconds. Both status indicators flash synchronously for 3 seconds, which indicates that the push button is now locked.
Unlock the push button	Press and release the button three times within 3 seconds. Both status indicators flash asynchronously for 3 seconds, which indicates that the push button is now unlocked.
Permanent lock	The push button can be permanently locked by connecting the white wire (pin 2) to -V.

Remote Teach (RT)

The sensor can be taught remotely via the white wire (pin 2).

Connection to +V acts the same as the button being pressed and no connection is the same as the button not being pressed. The sensor can be taught by following the same teach/timing sequence as used in the push button teach. For example, connect to the +V for more than 3 seconds to teach the target, disconnect from the +V; remove the target and connect to the +V for less than 1 second to teach the No Target condition. Remote teach can conduct all push button functions.

IO-Link

See publication 42JT-UM001 for IO-Link instructions. Remote Teach (pin 2) is disabled in IO-Link operation. If output is selected as dedicated NPN, IO-Link communication is unavailable.

Accessories

Table 3 - Mounting Brackets

Description	Dimensions	Cat. No.
Stainless-steel bracket	Figure 11 on page 5	60-BJS-L1
Stainless-steel bracket	Figure 12 on page 5	60-BJT-L2

Wiring Diagrams

The quick-disconnect connector is shown in the following diagrams. The pin numbers correspond to plug connectors on the sensor.

Figure 1 - Micro (M12) Plug QD Pigtail/Integral Pico (M8) Plug QD

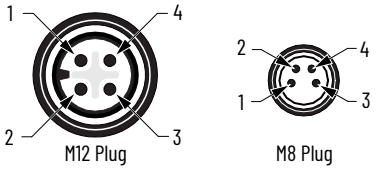
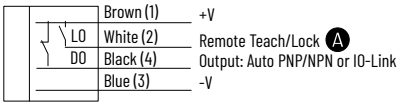


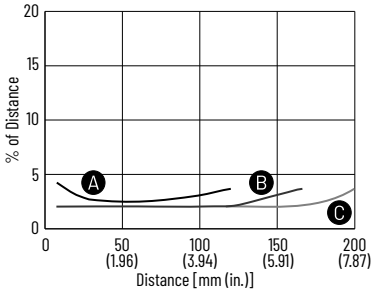
Figure 2 - Output Wiring



Item	Description
A	• Normal operation: No connection. Disabled in IO-Link operation. • Remote Teach: See Remote Teach (RT). • Push Button Lock: Connect to -V. See Push Button Lock/Unlock.

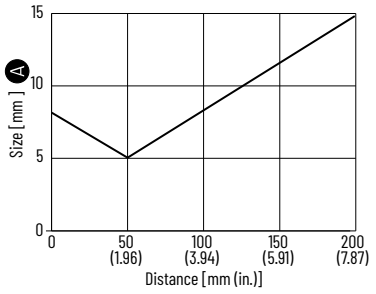
Typical Response Curves

Figure 3 - Background Suppression (180 mm)



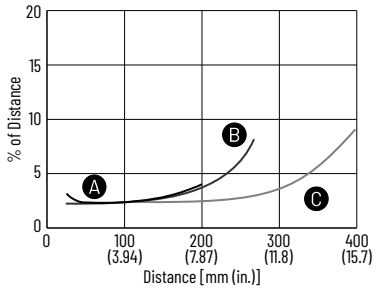
Item	Description
A	Black/white shift (6/90%)
B	Gray/white shift (18/90)
C	Hysteresis (90/90%)

Figure 4 - Background Suppression (180 mm Spot Size)



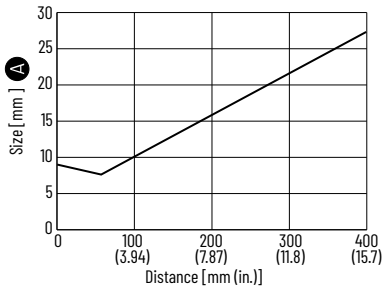
Item	Description
A	The spot size is square in shape with one side dimension per the graph.

Figure 5 - Background Suppression (400 mm)



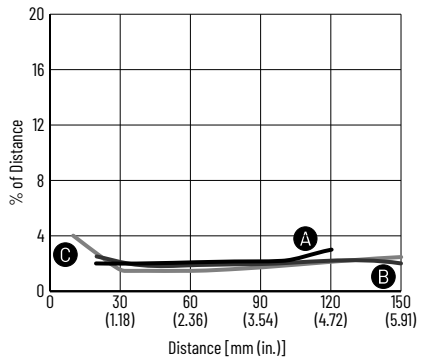
Item	Description
A	Black/white shift (6/90%)
B	Gray/white shift (18/90)
C	Hysteresis (90/90%)

Figure 6 - Background Suppression (400 mm Spot Size)



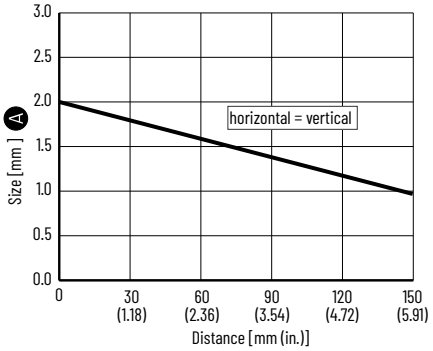
Item	Description
A	The spot size is square in shape with one side dimension per the graph.

Figure 7 - Laser Background Suppression (150 mm)



Item	Description
A	Black/white shift (6/90%)
B	Gray/white shift (18/90)
C	Hysteresis (90/90%)

Figure 8 - Laser Background Suppression (120 mm Spot Size)



Item	Description
A	The spot size is square in shape with one side dimension per the graph.

The minimum distance that is required between the target and the background depends upon the taught sensing range and the reflectivity of the target and background. The curves can be used as a guide in a given application.

Example (for 400 mm model): at around 230 mm taught sensing range, an 18% reflectivity gray target must be at least 5%, that is, 12 mm away from a 90% reflective white background.

Approximate Dimensions

Figure 9 - Integrated Cable Model [mm (in.)]

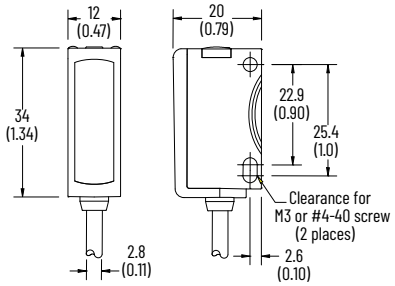


Figure 10 - QD Model [mm (in.)]

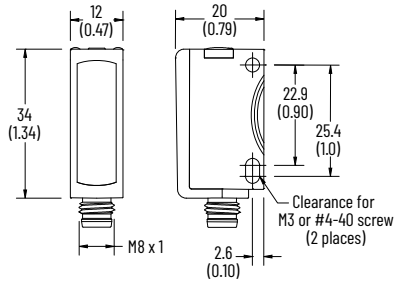


Figure 11 - Cat. No. 60-BJS-L1 — Stainless-steel Mounting Bracket

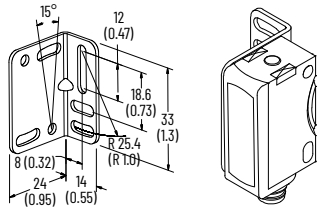
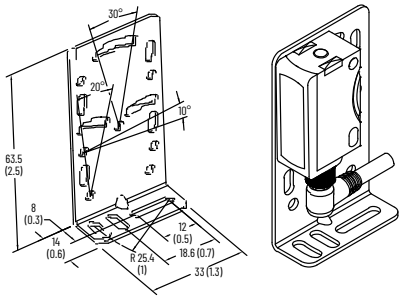


Figure 12 - Cat. No. 60-BJT-L2 — Stainless-steel Mounting Bracket



Specifications

Attribute	Visible Red [1] 42JT-B2LAT1-x 42JT-B2LAT2-x	Class 1 Laser [1] 42JT-B8LAT1-x
Environmental		
Certifications	cULus Listed, CE Marked for all applicable directives, and UKCA Marked for all applicable regulations	
Operating environment	IP67, IP69K, ECOLAB [2]	
Vibration	10…55 Hz, 1 mm amplitude (meets or exceeds IEC 60947-5-2)	
Shock	30 g with 1 ms pulse duration (meets or exceeds IEC 60947-5-2)	
Operating temperature	-20…+60 °C (-4…+140 °F) [3]	
Storage temperature	-20…+80 °C (-4…+176 °F)	
Optical		
Light source	Red 660 nm Class 1 650 nm	
Sensing distance (90% reflectivity white) [mm (in.)]	1…180 (0.04…7.09) [4]	4…150 (0.16…5.91)
	3…400 (0.12…15.8) [5]	
Sensing distance adjustability [mm (in.)]	10…180 (0.4…7.09)	12…150 (0.5…5.91)
	30…400 (1.2…15.8)	
Sensing distance (18% reflectivity gray) [mm (in.)]	2…160 (0.08…6.3) [4]	5…150 (0.2…5.91)
	6…260 (0.24…10.24) [5]	
Sensing distance (6% reflectivity black) [mm (in.)]	4…120 (0.16…4.72) [4]	8…120 (0.31…4.72)
	12…200 (0.5…7.9) [5]	
Adjustments	Push button	
Electrical		
Voltage	10…30V DC [6]	
Current consumption, max	30 mA	
Sensor protection	Reverse polarity, short circuit overload protection	
Outputs		
Response time	0.5 ms max	
Output type	Auto PNP/NPN or IO-Link	
Output function	Selectable light or dark operate	
Output current, max	100 mA	
Output leakage current, max	10 µA	
Mechanical		
Housing material	ABS	
Lens material	PMMA	
Cover material	PMMA	
Optional accessories	Mounting brackets, cordsets	

(1) For connection types, replace the x with: A2 for 2 m (6.6 ft) cable; P4 for integral 4-pin pico (M8) QD; F4 for 4-pin DC micro (M12) QD on 150 mm (6 in.) pigtail; and Y4 for 4-pin pico (M8) QD on 150 mm (6 in.) pigtail
(2) ECOLAB on P4 and A2 models only
(3) UL: -20…+50 °C (-4…+122 °F)
(4) For 42JT-B2LAT1 (180 mm) models
(5) For 42JT-B2LAT2 (400 mm) models
(6) UL: Class 2 source

Description of Laser Class

Class I Laser Product
Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to laser Notice No. 56 dated May 2019

Caution. Do not disassemble for repair.

Use of control or adjustments or performance of procedures other than those specified here, may result in hazardous radiation exposure. Do not attempt to disassemble this sensor for repair. A defective unit must be returned to the manufacturer.

Declaration of Conformity

CE Conformity

Rockwell Automation declares that the products that are shown in this document conform with the 2014/30/EU Electromagnetic Compatibility Directive (EMC) and that the respective standards and/or technical specifications have been applied.

For a comprehensive CE certificate visit: rok.auto/certifications

UKCA Conformity

Rockwell Automation declares that the products that are shown in this document are in compliance with 2016 No. 1091 Electromagnetic Compatibility Regulations and that the respective standards and/or technical specifications have been applied.

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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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