

Installation Instructions

42JT VisiSight™ Photoelectric Background Suppression Sensors with IO-Link

IMPORTANT: SAVE THESE INSTRUCTIONS FOR FUTURE USE.

Default Settings:

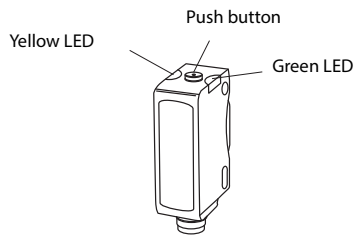
The factory default settings are as follows:

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



LED Status

The table below provides LED status in the RUN mode, during operation. The sensor is always in RUN mode, except when being taught.

Auto PNP/NPN Operation

Green	OFF	Power is OFF
	ON	Power is ON
	Flashing (6 Hz)	Unstable light level ($0.5 < \text{margin} < 2$)
	Flashing (1.5 Hz)	Output short circuit protection active
Yellow	OFF	Output de-energized
	ON	Output energized

IO-Link Operation

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

① Connection Types

Cat. No. Suffix	Description
-A2	2 m cable
-P4	Integral 4-pin pico (M8) QD
-F4	4-pin DC micro (M12) QD on 150 mm (6 in.) pigtail
-Y4	4-pin pico (M8) QD on 150 mm (6 in.) pigtail

General Specifications

	Visible Red 42JT-B2LAT1-❶ 42JT-B2LAT2-❶	Class 1 Laser 42JT-B8LAT1-❶
Environmental		
Certifications	cULus and CE Marked for all applicable directives	
Operating Environment	IP67, IP69K, ECOLAB❷	
Vibration	10... 55 Hz, 1 mm amplitude, meets or exceeds IEC 60947-5-2	
Shock	30 g with 1ms pulse duration, meets or exceeds IEC 60947-5-2	
Operating Temperature [C (F)]	-20...+60° (-4...+140°) ❸	
Storage Temperature [C (F)]	-20...+80° (-4...+176°)	
Optical		
Light Source	Red 660 nm	Class 1 650 nm
Sensing Distance (90% reflectivity white) [mm (in.)]	1...180 (0.04...7.09) ❹	4...120 (0.16...4.72))
	3...400 (0.12...15.8) ❺	
Sensing Distance Adjustability [mm (in.)]	10...180 (0.4...7.09)	10...120 (0.4...4.72)
	30...400 (1.2...15.8)	
Sensing Distance (18% reflectivity grey) [mm (in.)]	2...160 (0.08...6.3) ❹	5...110 (0.2...4.33)
	6...260 (0.24...10.24) ❺	
Sensing Distance (6% reflectivity black) [mm (in.)]	4...120 (0.16...4.72) ❹	8...100 (0.31...3.9)
	12...200 (0.5...7.9) ❺	
Adjustments	Push button	
Electrical		
Voltage	10...30V DC ❻	
Current Consumption	30 mA max.	
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	100 mA max.	
Output Leakage Current	10 µA max.	
Mechanical		
Housing Material	ABS	
Lens Material	PMMA	
Cover Material	PMMA	
Optional Accessories	Mounting brackets, cordsets	

① See Connection Types table

② ECOLAB on P4 and A2 models only

③ UL: -20...+50°C (-4...122°F)

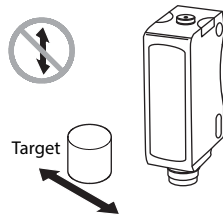
④ For 42JT-B2LAT1 (180 mm) models

⑤ For 42JT-B2LAT2 (400 mm) models

⑥ UL: Class 2 source

Mounting the Sensor

Securely mount the sensor on a firm, stable surface or support. An application subject to excessive vibration or shifting may cause intermittent operation. For installation convenience, Rockwell Automation offers a wide range of mounting brackets (see Accessories section for more detail).



Note: Due to the detection method, targets travelling horizontally to the sensor's optics are detected. Targets travelling vertically may not be accurately detected. For reliable background suppression, a minimum separation distance is recommended between the target and the background; however this can vary depending on the application. Refer to the Typical Response Curves section.

VisiSight™ Configuration

The 42JT VisiSight is configured using the push button or Remote Teach or via IO-Link, and the LED 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.

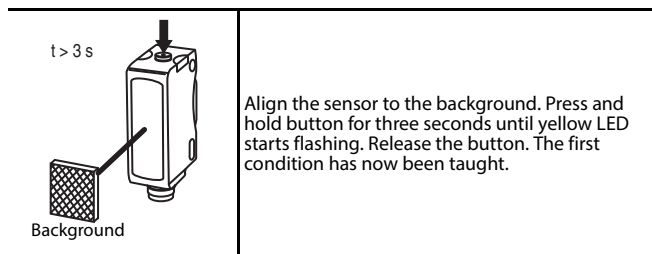
Teach Sensitivity/Sensing Range

The default setting is the maximum sensitivity/range.

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. To teach the background (first condition):

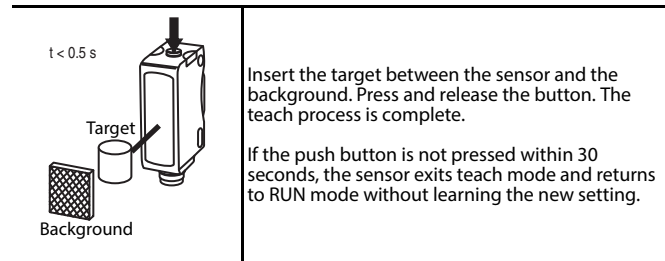


Align the sensor to the background. Press and hold button for three seconds until yellow LED starts flashing. Release the button. The first condition has now been taught.

2. Teach "target" (second condition):

IMPORTANT

In the case of multiple reflectivity targets, choose the darkest/least reflective target placed in its farthest position for set up.



Insert the target between the sensor and the background. Press and release the button. The teach process is complete.

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

If there's no background surface in the field of view in Step 1, the switching threshold will be 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).

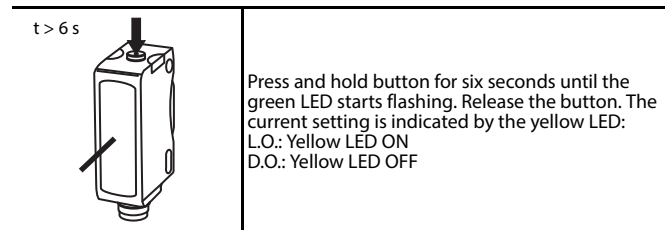
Restore to factory default setting of maximum range: Perform steps 1 and 2 with "no target" in the sensor's field of view and nothing in the background.

Teach Light Operate (L.O.) or Dark Operate (D.O.)

The default setting of the output is Light Operate (L.O.)

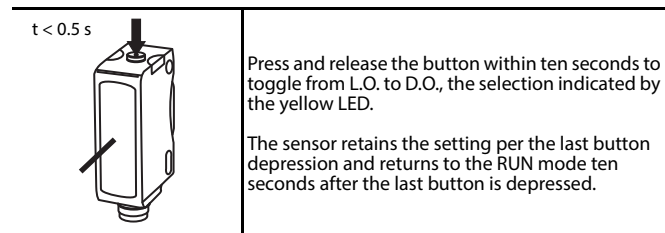
L.O. setting means that output turns ON when the target is detected. If the application requires the output to turn OFF when the target is detected, the setting may be changed to Dark Operate (D.O.).

1. To access the teach output mode setting:



Press and hold button for six seconds until the green LED starts flashing. Release the button. The current setting is indicated by the yellow LED:
L.O.: Yellow LED ON
D.O.: Yellow LED OFF

2. To change the sensor output mode setting:



Press and release the button within ten seconds to toggle from L.O. to D.O., the selection indicated by the yellow LED.

The sensor retains the setting per the last button depression and returns to the RUN mode ten seconds after the last button is depressed.

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, i.e. 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.

- b. 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 (e.g. a relay contact in series with the load), select dedicated NPN.

Selection can be made as follows:

1. **To access output type:** Press and hold the push button for 12 seconds (until both LEDs start flashing synchronously). Upon button release, the current setting of output type is indicated by the slow flashing of the LED(s) as follows:
 - Auto PNP/NPN: both LEDs flashing
 - Dedicated NPN: green LED flashing
 - Dedicated PNP: yellow LED flashing
2. **To 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 type selected is indicated by the LEDs. The sensor retains the setting per the last button depression and returns to the RUN mode 10 seconds after the last button is pressed.

Push Button Lock/Unlock

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

To lock the push button: press and release the button three times within three seconds. Both LEDs flash synchronously for three seconds indicating that the push button is now locked.

To unlock the push button: press and release the button three times within three seconds. Both LEDs flash asynchronously for three seconds indicating that the push button is now unlocked.

Permanent Lock: The push button may 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 (e.g., connect to the +V for more than three seconds to teach the "target," disconnect from the +V; remove the target and connect to the +V for less than one second to teach the "no target" condition. All push button functions can also be carried out via RT.

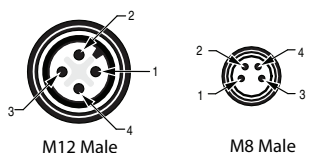
IO-Link

See instructions for IO-Link on www.ab.com. Remote Teach (pin 2) is disabled in IO-Link operation. If output is selected as dedicated NPN, IO-Link communication is unavailable.

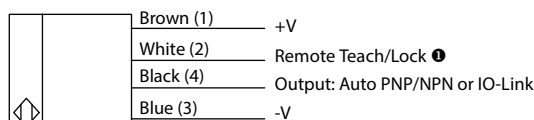
Wiring Diagrams

The quick-disconnect connector is shown below. The pin numbers correspond to male connectors on the sensor.

Micro (M12) Male QD Pigtail/Integral Pico (M8) Male QD

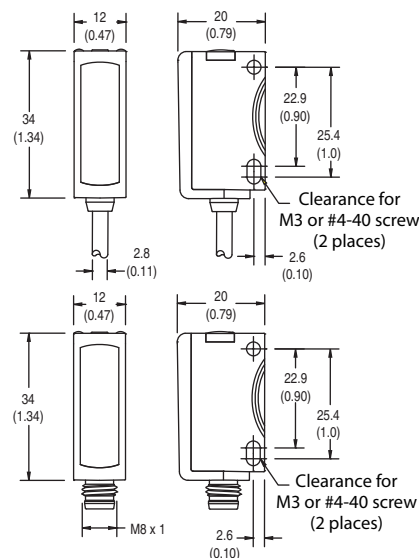


Output Wiring



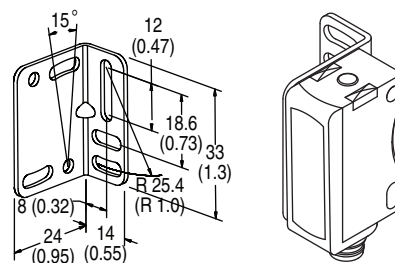
- Normal operation: no connection. (Disabled in IO-Link operation.)
- Remote Teach: refer to the Remote Teach section.
- Push Button Lock: connect to -V. Refer to the Push Button Lock/Unlock section.

Approximate Dimensions [mm (in.)]

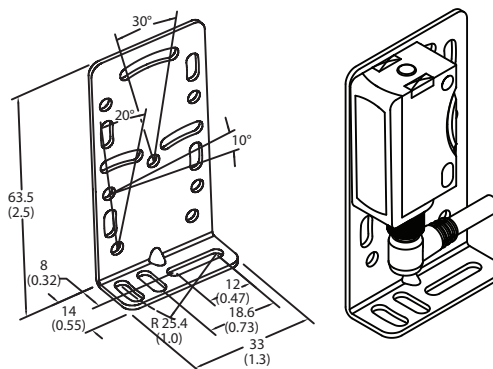


Accessories: Stainless Steel Mounting Brackets

1) 60-BJS-L1



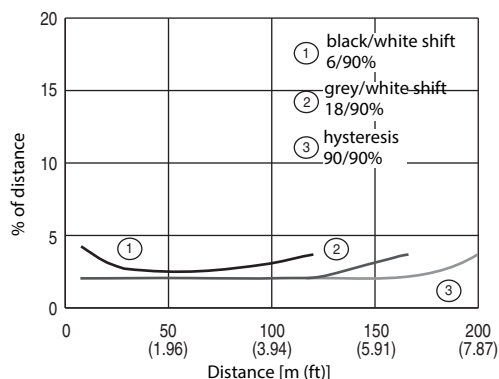
2) 60-BJT-L2



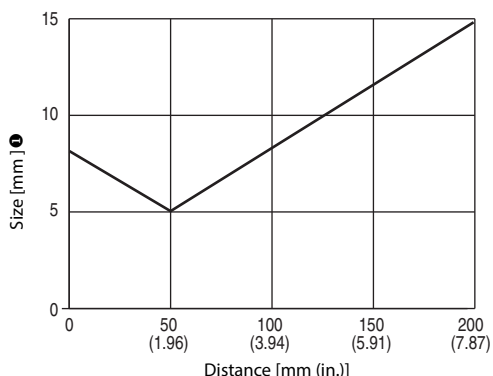
3) 60-2619 VisiSight-compatible swivel/tilt mounting bracket

Typical Response Curves

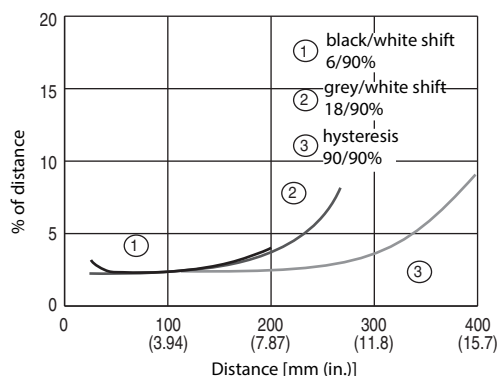
Background Suppression (180 mm)



Background Suppression (180 mm) — Spot Size

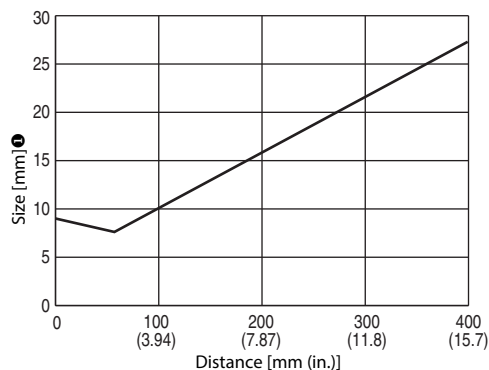


Background Suppression (400 mm)

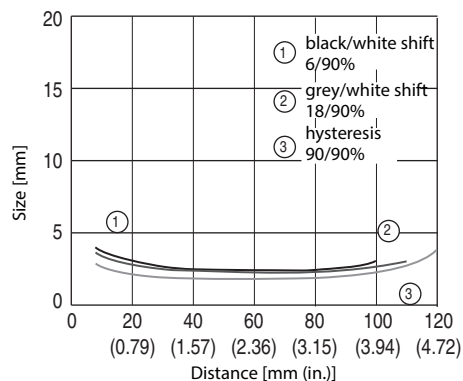


① The spot is square in shape with one side dimension per graph.

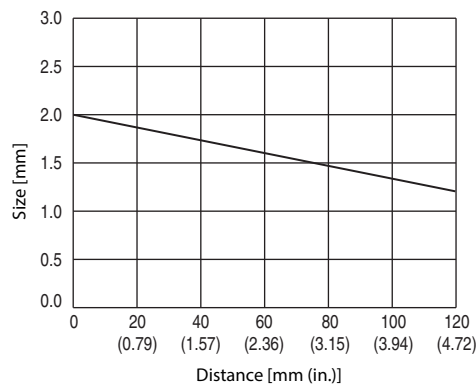
Background Suppression (400 mm) — Spot Size



Laser Background Suppression (120 mm)



Laser Background Suppression — Spot Size



The minimum distance required between the target and the background depends upon the taught sensing range, the reflectivity of the target, and the reflectivity of the 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 grey target needs to be at least 5%, i.e., 12 mm away from a 90% reflective white background.

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

www.rockwellautomation.com

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