Q4X Series

Versatile, Rugged Laser Distance Sensor

- Housing rated to IP69K with FDA-grade stainless steel
- Discrete, Analog, IO-Link outputs available
- Precise measurement up to 610 mm
- Reliably detects opaque and transparent objects

Easy-to-Use. Problem Solver.

Reliable, durable sensor that solves even the most challenging applications.

Bright LED output indicator and **real-time distance feedback** of distance (mm) or analog output (0-10 V, 4-20 mA) provides **easy setup and troubleshooting**, leading to reduced installation costs

Industry standard 18 mm threaded barrel housing option for quick installation

Remote input allows for remote teaching, laser enable and advanced measurement modes to **expand the range of applications solved** with a single sensor

Robust FDA grade stainless steel housing for even the most demanding environments; IP67, IP68, IP69K

Compact housing to fit in tight spaces with **flat face** option for food and beverage

Class 1 laser with small, highly visible laser spot for **easy alignment** and **small object detection**

Lens cover made from **PMMA acrylic**

IO-Link®

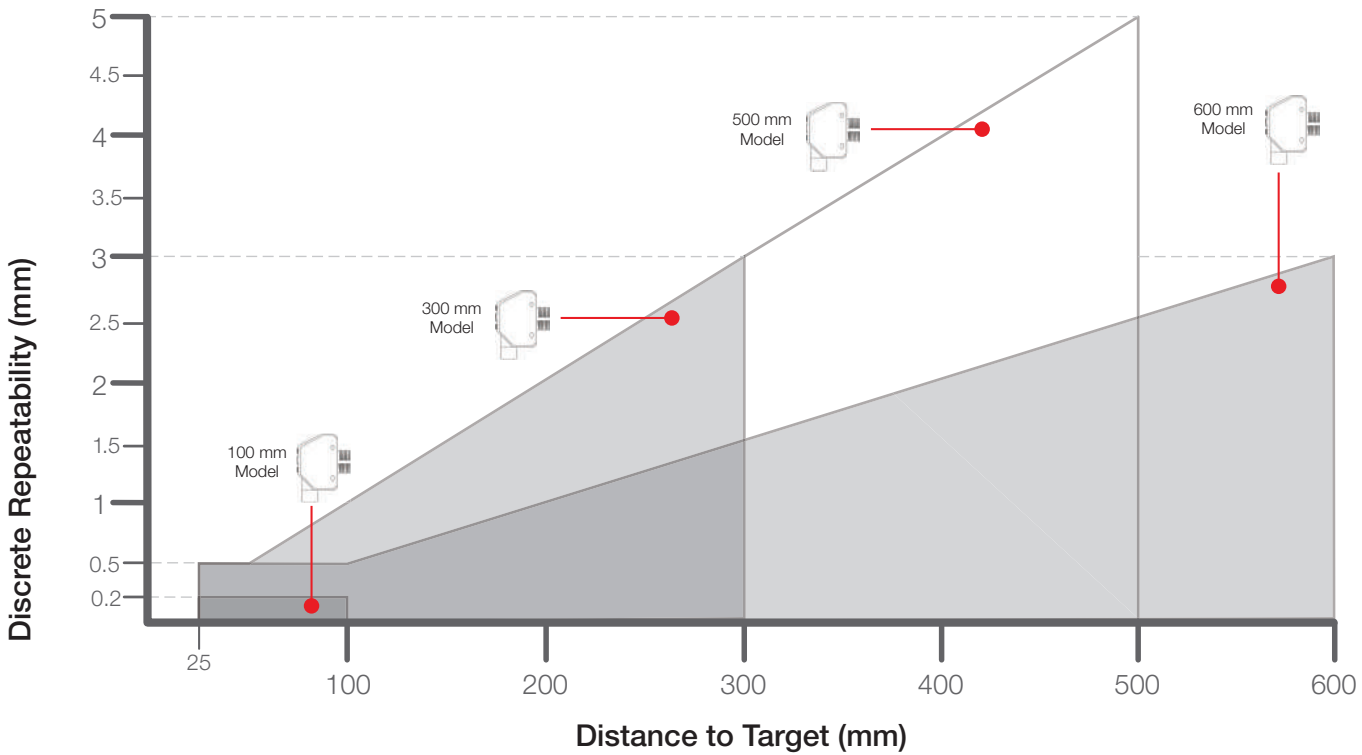
Challenging Targets

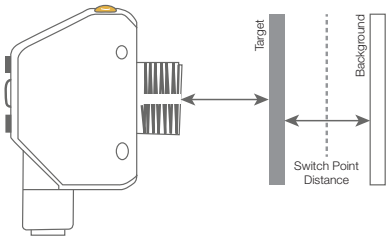
Round | Uneven | Shiny or metal | Dark surface | Clear

Dynamically adjusted laser power increases output for dark targets or objects at steep or uneven angles, while reducing power for shiny targets, providing accurate measurements across a wide range of challenging targets.

BANNER

Distance: Precision Measurement and Detection Regardless of Target



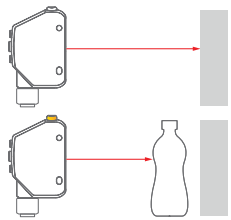


Minimum object detection size for challenging targets (6% reflectivity) at close range.

Q4X...100 / 110	0.5 mm
Q4X...300 / 310	1 mm
Q4X...500	1 mm
Q4X...600 / 610	1 mm

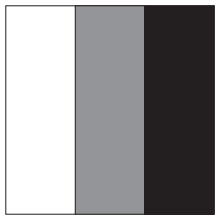
Dual mode: Distance with Intensity to Detect Any Change

Clear Object Detection



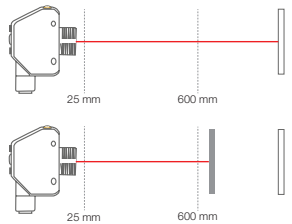
Reliably detects transparent objects without the need of a retro reflector.

Contrast



Detects intensity changes due to variation in surface finish, tone, or lightness.

Extended Range Presence/Absence



Teach reference to detect changes in contrast, even past the maximum measuring range.

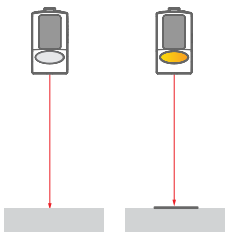
Presence and Absence

Application Challenge

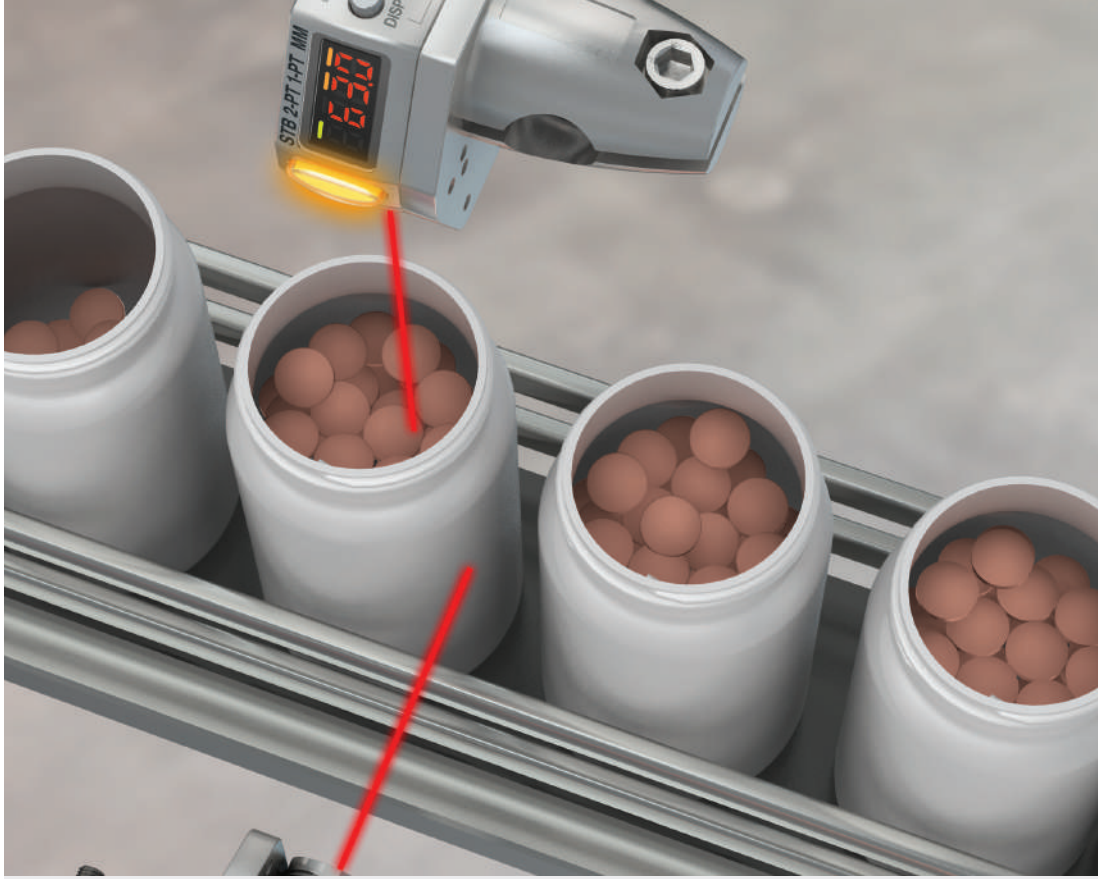
The presence of candy bars on a conveyor must be verified to trigger down the line processes. The candy bars can vary in size, shape, texture, and color consistency, complicating detection. At times there is little contrast between the candy bars and the conveyor, further complicating detection.

Application Solution

A Q4X measures the distance from the face of the sensor to the conveyor. Capable of detecting sub-millimeter changes in distance, the Q4X easily detects the slight variations in height that indicate the presence of a candy bar on the conveyor. The sensor has an FDA grade stainless steel flush mount housing and can withstand aggressive washdown procedures.



Distance-based presence/absence detection or part positioning regardless of color or reflectivity of object and background.



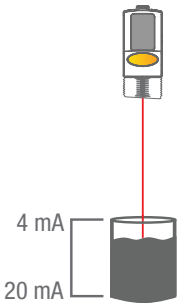
Measurement

Application Challenge

Measuring the fill level of pills in a bottle helps ensure that the quantities inside the bottle are correct. However, the shape, edges, and gaps between pills create an inconsistent surface which is difficult to measure.

Application Solution

A Q4X analog sensor set up in trigger mode uses the averaging feature to provide a more consistent fill level measurement. A connected Q3X contrast sensor detects the leading edge of each bottle and uses a one-shot output timer to determine when and how long the Q4X will measure. The Q4X then measures across the varying surface inside the bottle and outputs a single analog value based on the average measurement.



Analog output for continuous measurement of part size, position, or fill level.

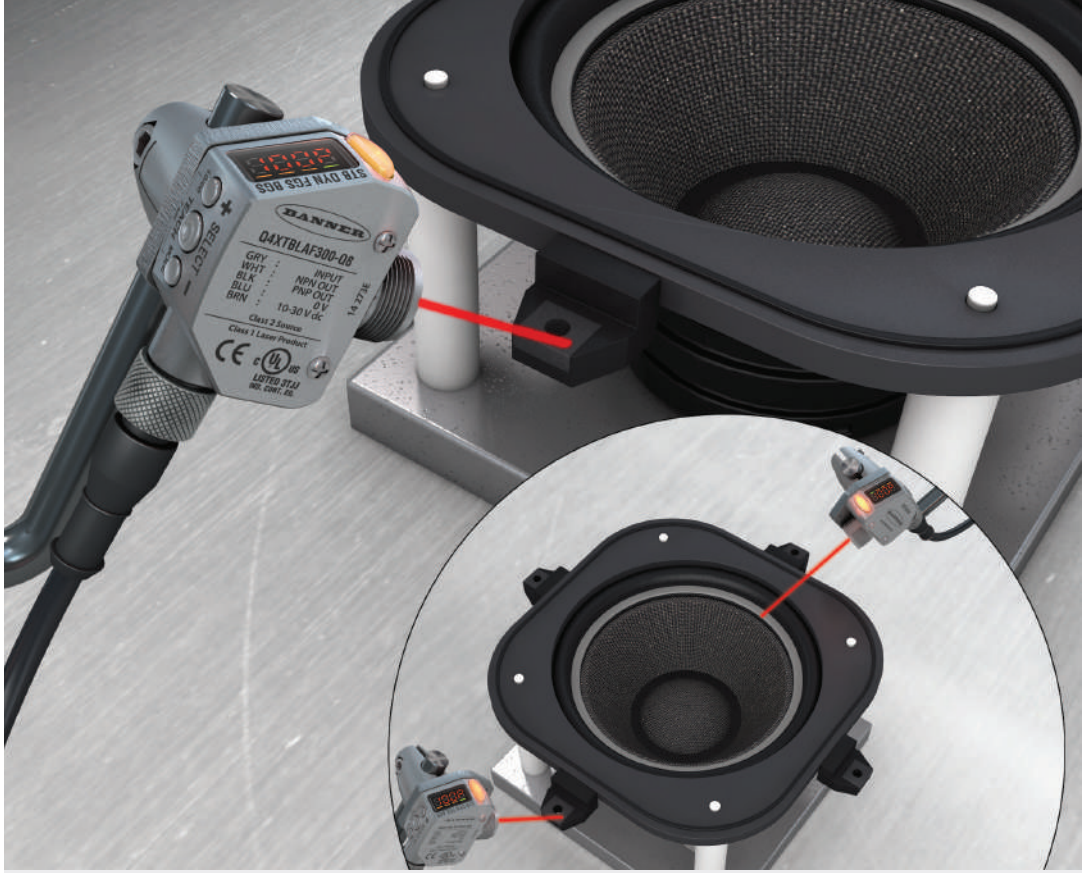
Error Proofing

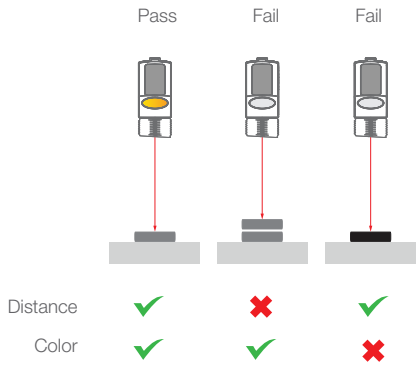
Application Challenge

In a car speaker assembly the presence and placement of all components must be verified to ensure that defective or incomplete product is not shipped to the customer. The small sizes, slim profiles and similar colors of many components can make identifying errors difficult.

Application Solution

By measuring the distance from the face of the sensor to the mounting bracket, a Q4X verifies that a single spacer is present and properly seated. Using dual mode detection, the Q4X can also measure the amount of light received to determine if the spacer has been placed with the adhesive side up or down. The compact size of the Q4X allows for an unobtrusive installation into congested assembly stations.





Inspections use distance to verify parts presence and position, and intensity to verify correct color or part orientation

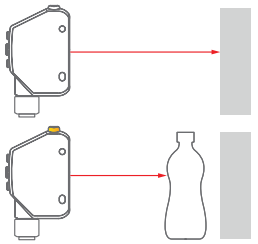
Clear Object Detection

Application Challenge

Regulating the flow of bottles on a conveyor can prevent damage to the bottles, product loss, machine downtime, and helps to ensure that downstream processes progress smoothly. Variations in bottle shape, size, material, color, and transparency can make detecting bottles and accumulations difficult.

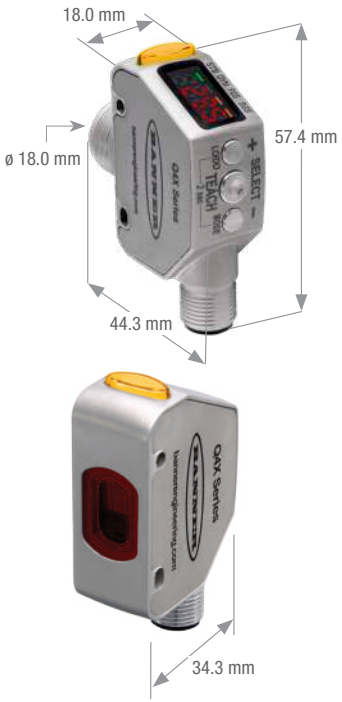
Application Solution

Taught to recognize a stable background condition, a Q4X operating in dual mode will detect any alteration in the distance to and light intensity from the background condition, making the sensor immune to variations in bottle shape, size, color, clarity, and reflectivity. The Q4X has integral on/off delays that can send a signal if an accumulation occurs.



Reliably detects transparent objects without the need of a retro reflector.

Q4X Laser Distance Sensor



Family	Housing Style	Output	Mode	Range		Connector
Q4X	**T**	**B**	**LAF**	**100**	–	**Q8**
	T = 18 mm Threaded Barrel	**B** = Bipolar Discrete NPN & PNP **K** = Dual Discrete with IO-Link	**LAF** = Laser Adjustable-Field	**100** = 25-100 mm **300** = 25-300 mm **500** = 25-500 mm* **600** = 25-600 mm * Not available with Dual Discrete / IO-Link Output (K models)		**Q8** = Integral QD QD models require mating cordset

Family	Housing Style	Output	Mode	Range		Connector
Q4X	**F**	**N**	**LAF**	**110**	–	**Q8**
	F = Flush Mount	**N** = NPN **P** = PNP **K** = Dual Discrete with IO-Link	**LAF** = Laser Adjustable-Field	**110** = 35-110 mm **310** = 35-310 mm **610** = 35-610 mm		**Q8** = Integral QD QD models require mating cordset

Response Speed	User selectable as fast as: Discrete and Dual Discrete: 1.5 ms Analog: 0.5 ms
Operating Conditions	-10 to +50 °C
Environmental Rating	IP67, IP68, IP69K

Construction	Housing: 316L stainless steel Lens cover: PMMA acrylic Indicator & Display Window: Polysulfone
Certifications	Industrial Control Equipment 3TJJ

Accessories

SMBQ4XFA
includes 3/8" bolt for mounting

SMBQ4XFAM10
includes 10 mm bolt for mounting

SMBQ4XFAM12
clamps directly onto industry standard bracket systems of 1/2" or 12 mm rods

(add -SS to above for stainless steel)

SMB18A
12-ga. stainless steel

SMBAMS18P
12-ga. cold-rolled steel

SMB46L2
12-ga. cold-rolled steel

Reference Targets for Clear Object Detection

BRT-Q4X-60X50
50 x 60 x 6 mm

BRT-Q4X-60X18
18 x 60 x 6 mm

Cordsets for Analog Models

0 to 10 V, 4 to 20 mA

	5-Pin
M12 Connector with Shield Straight connector models listed; for right-angle, add **RA** to the end of the model number (example, **MQDEC2-506RA)**	**MQDEC2-506** 2 m (6.5') **MQDEC2-515** 5 m (15') **MQDEC2-530** 9 m (30')

	5-Pin
M12 Connector Washdown (IP68) with shield Straight connector models only	**MQDCWD-506** 2 m (6.5') **MQDCWD-530** 9 m (30')

Cordsets for Other Models

Bipolar (5-pin) and PNP, NPN and Dual Discrete (4-pin)

	4-Pin	5-Pin
M12 Connector Straight connector models listed; for right-angle, add **RA** to the end of the model number (example, **MQDC1-506RA)**	**MQDC-406** 2 m (6.5') **MQDC-415** 5 m (15') **MQDC-430** 9 m (30')	**MQDC1-506** 2 m (6.5') **MQDC1-515** 5 m (15') **MQDC1-530** 9 m (30')

	4-Pin	5-Pin
M12 Connector Washdown (IP69K) Straight connector models only	**MQDC-WDSS-0406** 2 m (6.5') **MQDC-WDSS-0415** 5 m (15') **MQDC-WDSS-0430** 9 m (30')	**MQDC-WDSS-0506** 2 m (6.5') **MQDC-WDSS-0515** 5 m (15') **MQDC-WDSS-0530** 9 m (30')

PN 183055 rev. F