OMRON

Advanced reflective photoelectric sensors for flexible manufacturing

Long distance sensing and time of flight (TOF) technology

Distance-settable Time of flight Photoelectric Sensors

E3AS Series

INTEGRATED | INTELLIGENT | INTERACTIVE

IO-Link ECOLAB

Use reflective photoelectric sensors in flexible applications

Conventional reflective photoelectric sensors have limited sensing ranges and are prone to false detection with changes in the size, color, or reflectivity of the target.

The E3AS-F Series uses the time-of-flight (TOF) technology to resolve these issues. E3AS-F sensors can be used in high-mix conveyor lines that transport products of varying colors, as well as assembly lines with restricted installation space.

Exceptionally long sensing range of 50 to 1,500 mm

Enables flexibility when addressing applications with variable sensing requirements

Stable detection for variable targets

Reduces setup and adjustment time

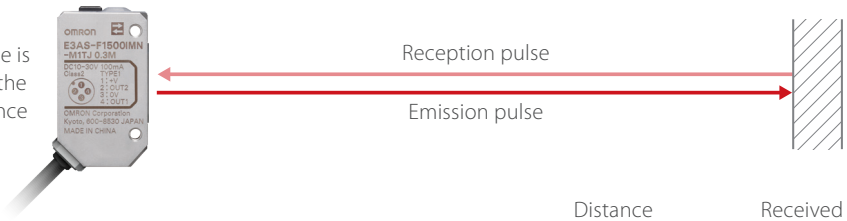
Compact body

Overcomes space limitations

TOF detects varying targets and measures distance

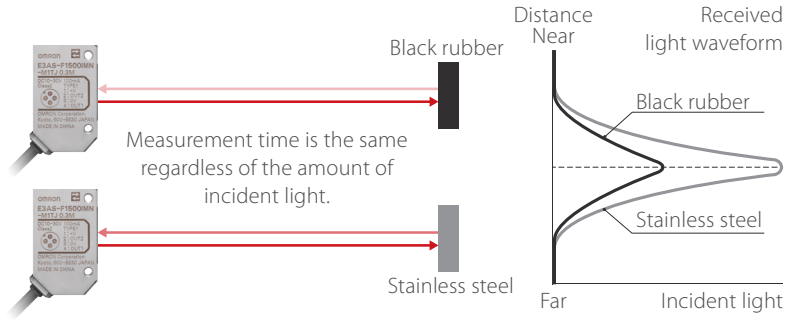
TOF method

In the time-of-flight method, the output distance is calculated based on the time elapsed between the light emission and its reception by the sensor once it is reflected off the target.



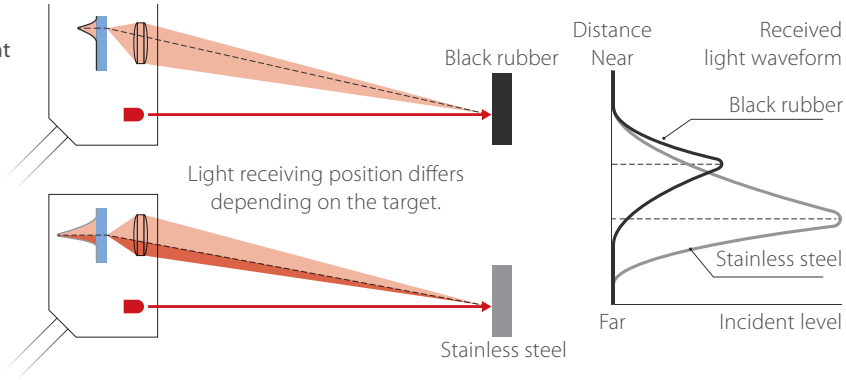
Why TOF method enables stable detection without adjustment

In the TOF method, the distance is measured based on the elapsed time instead of the amount of incident light received. Measurements therefore are not affected by changes in the color or material of the target, meaning targets with low reflectivity, such as black rubber, can be detected from longer distances.



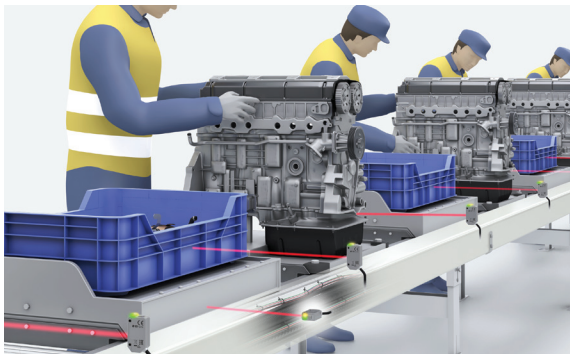
Why triangulation method requires adjustment

The distance is measured from the light receiving position in the triangulation method. The position varies due to changes in the received light waveform, which is affected by the reflectance properties (regular or diffuse) of the target color or material. Workpieces with low reflectivity, such as black rubber, can only deliver a small amount of light, and can only be detected by reducing the distance between the target and the sensor.



Common applications for the E3AS-F sensors

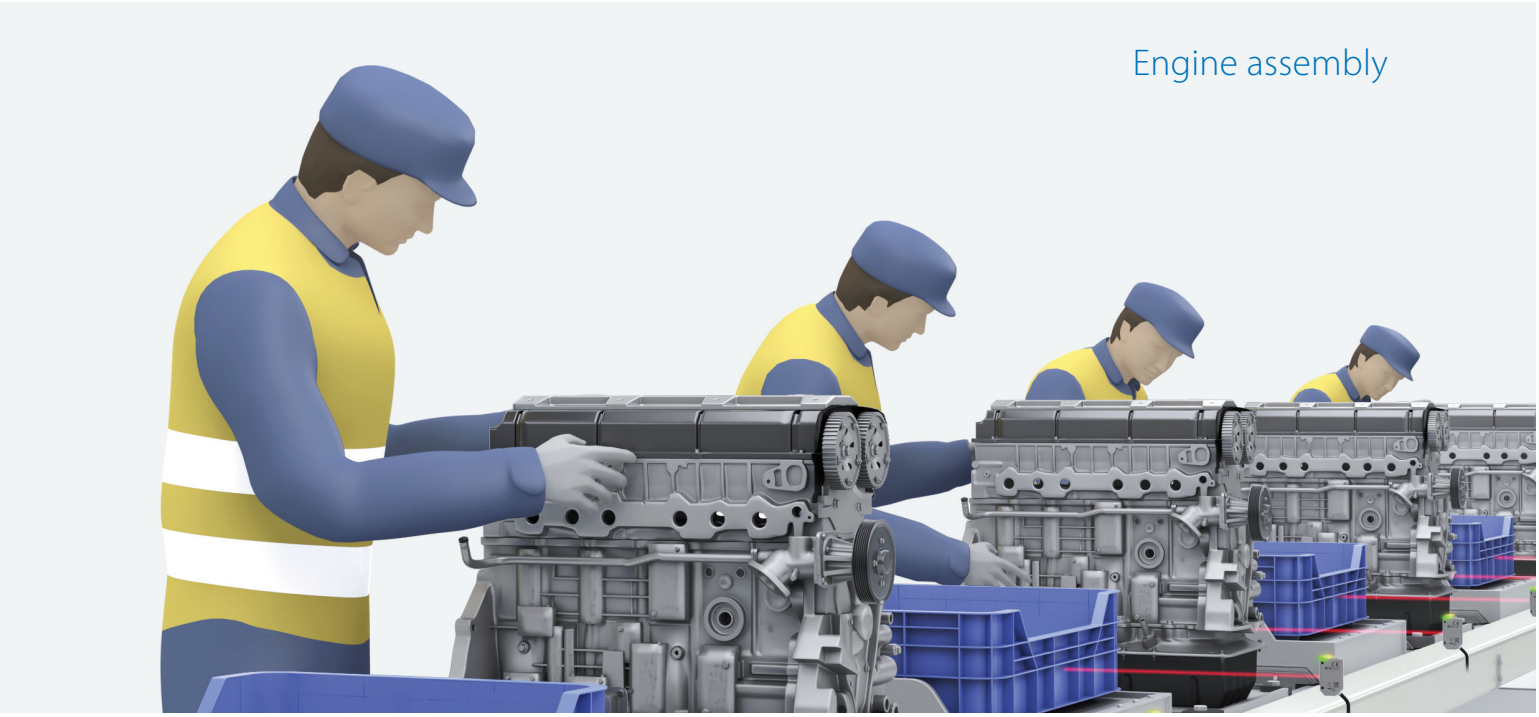
Conveyor lines

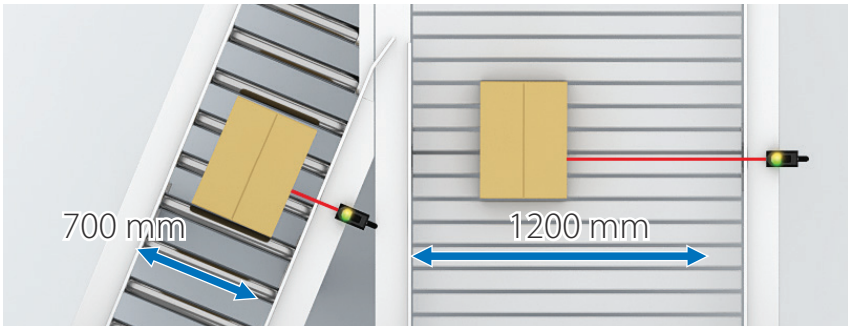


Engine assembly

Design diverging and converging conveyor lines with a single model

E3AS-F Sensors can detect targets based on only their distance, eliminating the need to optimize sensor positioning for different targets.

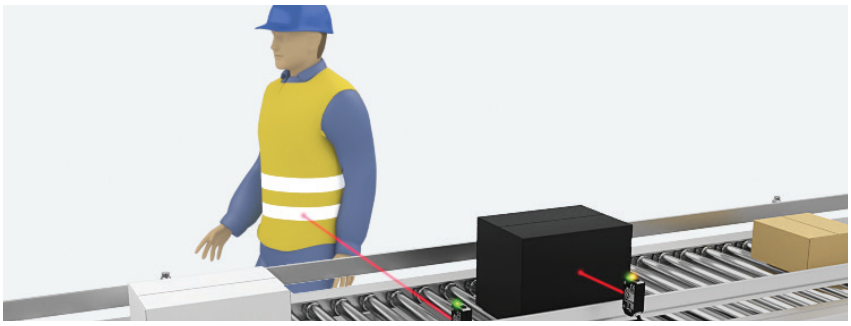




Wide sensing range for various conveyor line widths

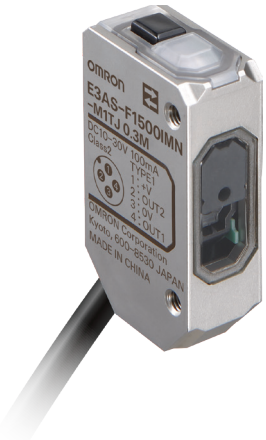
E3AS-F Sensors have a wide sensing range (50 to 1,500 mm), allowing users to standardize on one sensor.

E3AS-F1□□□P

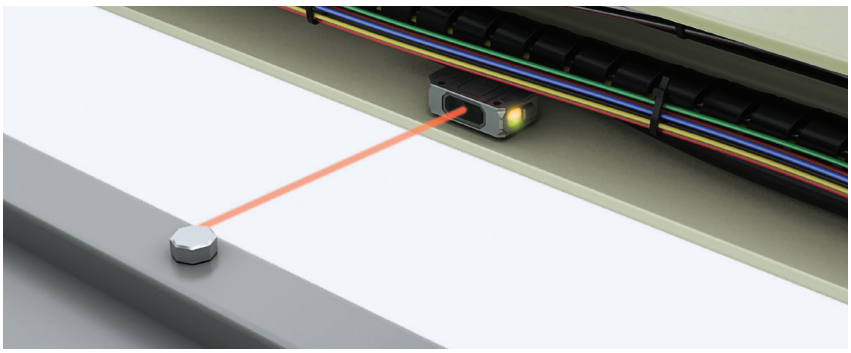


TOF method enables detection of various targets on conveyor lines

E3AS-F sensors detect targets with varying color or material by detecting the distance of the object.



E3AS-F1□□□M



Compact enough for confined spaces

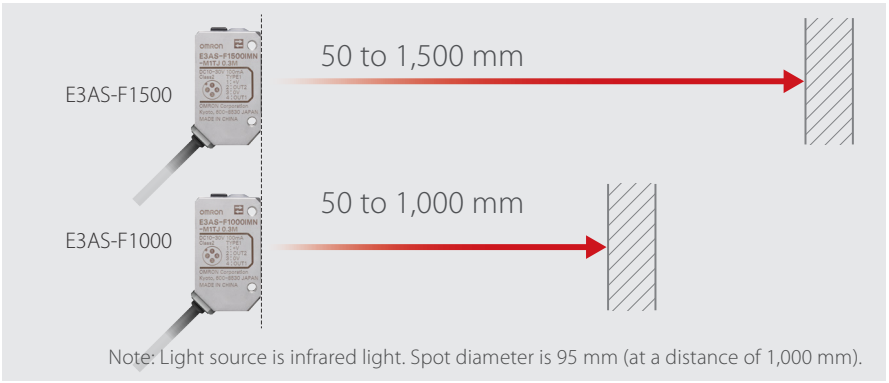
E3AS-F Sensors can be installed in challenging locations.

Reduce selection/commissioning time

Two sensing distance models

Offered in two types of material options:

Actual size W 11.4 x D 22 x H 37.9 mm



Note: Light source is infrared light. Spot diameter is 95 mm (at a distance of 1,000 mm).

Short-distance sensing models also available

Equipped with OMRON's unique light emitting element for stable detection of targets with low reflectivity. Ideal for detecting small, thin workpieces.

Distance-settable Photoelectric Sensors E3AS-L Series

Sensing range	10 to 80 mm 10 to 200 mm

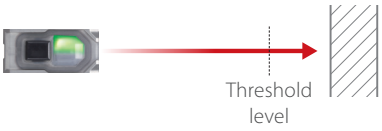
Single teach button for ease of use

Easily and consistently set the optimal threshold level using the teaching button.

Teaching without a target

Set the threshold at approx. 85% of the distance between the sensor and the background (reference surface).

Hold teach button



Two-point teaching

Set the threshold at a value halfway between when a target is present and when one is not. Settings can be done with the workpiece present first or with the target absent first.

Place target in position and press the teach button

Press the teach button without the target in place

Reduce sensor cleaning frequency and replacement

Anti-fouling coating prevents contamination of the sensing surface Patent Pending [1]

A dirty sensing surface can cause false detection. The E3AS Series has an anti-fouling coating on the sensing surface which prevents water droplets, oil, and dust from sticking to the sensing surface and keeps the lens from fogging as well.

Anti-fouling coating
Water

Anti-fouling coating
Cutting oil

Anti-fouling coating
Paper dust

Anti-fouling coating
Water vapor

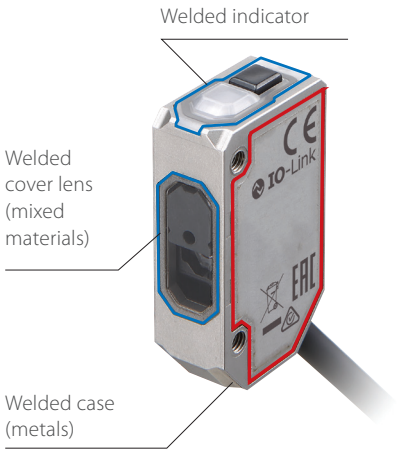
Laser welded construction increases environmental resistance

OMRON's two unique laser welding technologies, for mixed materials and for homogeneous metals , enhances the sealing and adhesion between the stainless steel and resin.

IP69K High temperatures/ high water pressure

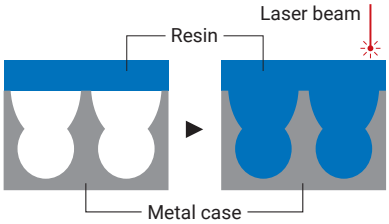
IP67G Oil resistance

ECOLAB Detergent resistance



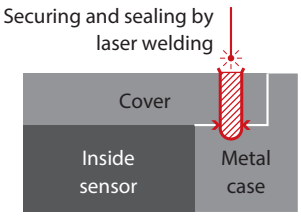
Laser welding technology for mixed materials Patented [1]

Small holes are bored into the metal case, then the resin part is melted in by a laser for secure sealing and adhesion.



Laser welding technology for metals

The metal case and cover are welded by a laser to seal gaps ensuring higher airtightness compared to adhesives.



*1. Patent pending in Japan and Patented in Japan. (As of August 2019)

IO-Link reduces commissioning time

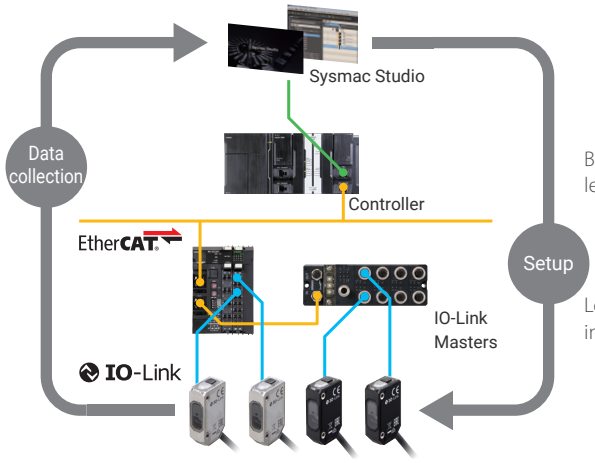
IO-Link enables batch-writing of sensor setup information, effectively reducing commissioning time and inconsistent settings. It also enables users to check sensor IDs, allowing them to efficiently perform I/O checks on the thousands of sensors installed on a line.

Setup Setting all sensors from a single host device

Sensor setting information can be batch-written, eliminating the need to setup a large number of sensors individually.

Batch sensor status check

Monitor output of the detection and incident levels [1]

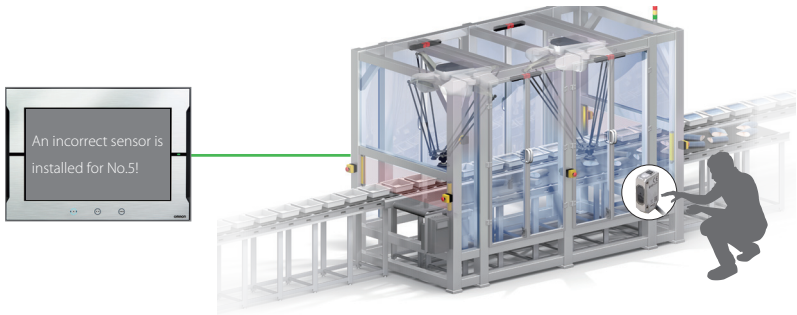


Batch write specified threshold levels from host devices

Less commissioning time and inconsistent settings

I/O check ID check prevents installation mistakes

Sensor IDs can be batch checked, making it easy for users to check installation mistakes or disconnected sensors.



Note: Screen is a conceptual illustration.

Note: Setting of the IO-Link master or programming for the PLC is required.

[1] E3AS-F only

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Note: Specifications are subject to change.

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