

Achieving "innovations in distance" for reflective-type photoelectric sensors



Use reflective photoelectric sensors in entirely new ways.

Conventional reflective photoelectric sensors have issues that may limit their range of application, such as their short sensing distances, possible false detection due to the effect of workpiece colors, and their large sizes.

The E3AS-F Series adopts the TOF method, which effectively resolves these issues for increased versatility. E3AS-F Sensors can be used, for example, in high-mix conveyor lines carrying products of various colors and shapes, and assembly lines with restricted space for sensor installation.

Wide sensing range of 50 to 1,500 mm

Free users from selecting sensors depending on the sensing distance.

Stable detection for various workpieces

Reduce evaluation and adjustment time.

Compact body

Eliminate restrictions on installing locations.

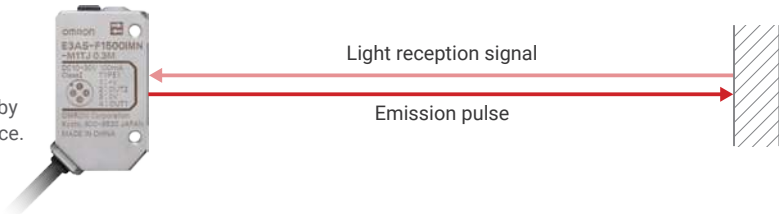


Note: Pre-wired Models and M8/M12 Pre-wired Connector Models will be coming soon.

TOF method to stably detect various workpieces

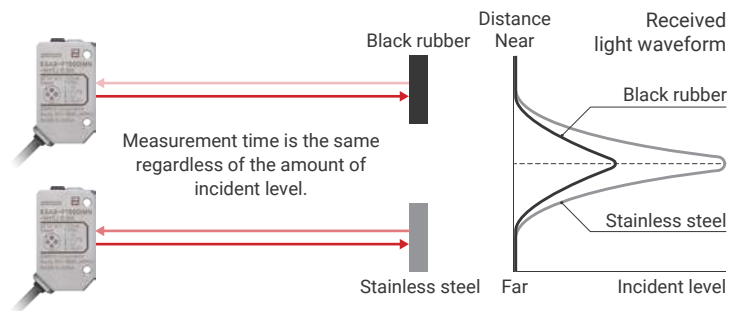
TOF method

In the TOF ("Time of Flight") method, the distance is calculated from the time elapsed between the light emission and its reception by the sensor, after it is reflected off the workpiece.



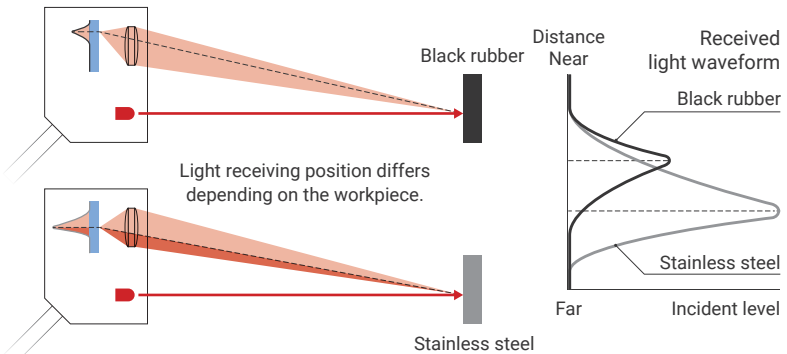
Why TOF method enables stable detection

In the TOF method, the distance is measured based on the elapsed time. Measurements therefore are not affected by changes in the color or material of the workpiece. This allows for stable detection without adjustment for each workpiece. This method also enables sensors to detect objects even when the incident level is small. This means that workpieces with low reflectivity, such as black rubber, can be detected from longer distances.



Why triangulation method needs adjustment

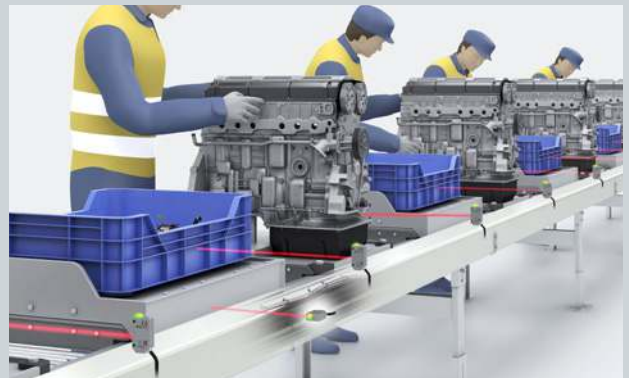
The distance is measured from the light receiving position in a triangulation method. The position varies due to changes in the received light waveform, which is affected by the reflectance properties (regular or diffuse) of the workpiece color or material. This means that the sensor needs to be adjusted for each workpiece. Workpieces with low reflectivity, such as black rubber, can only deliver a small amount of light, and thus can only be detected within shorter distances.



E3AS-F Application



Conveyor line P.4



Engine assembly line P.6

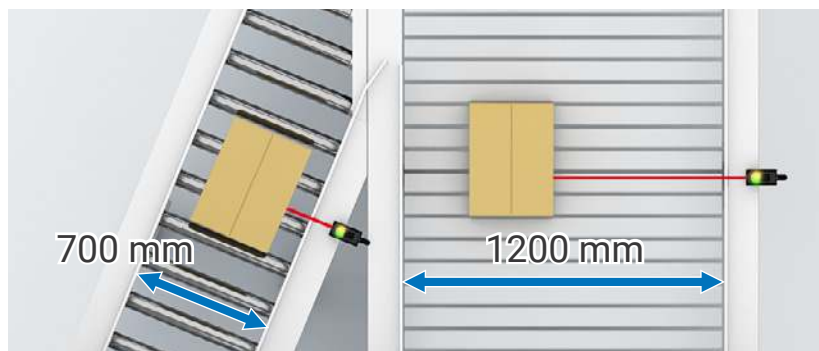
Design diverging and converging conveyor lines with a

E3AS-F Sensors can detect workpieces by the set distance regardless of their colors or materials, reducing the time required for evaluation and adjustment of each workpiece. Compared to through-beam and retro-reflective models, they require half the work to install, significantly saving setup time.



E3AS-F1□□□P

single model



Wide sensing range for various conveyor line widths

Previously, users had to select sensors depending on the required sensing distance. With E3AS-F Sensors, which have a wide sensing range of 50 to 1,500 mm, there is no need to select a different sensor for each application.



TOF method enables detection of various workpieces on the conveyor line

With conventional photoelectric sensors, prior evaluation was required for each workpiece to be detected. E3AS-F Sensors detect workpieces varying in colors and materials by the set distance. This helps reduce evaluation and adjustment time. Also, they do not detect workers working near the line by mistake.



Small enough to be installed in AGVs

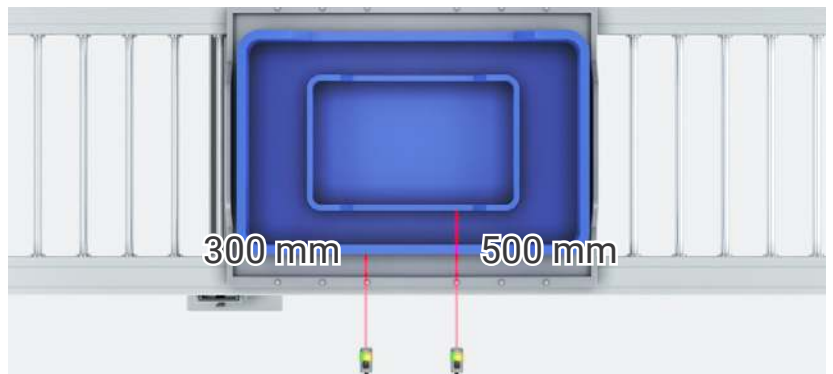
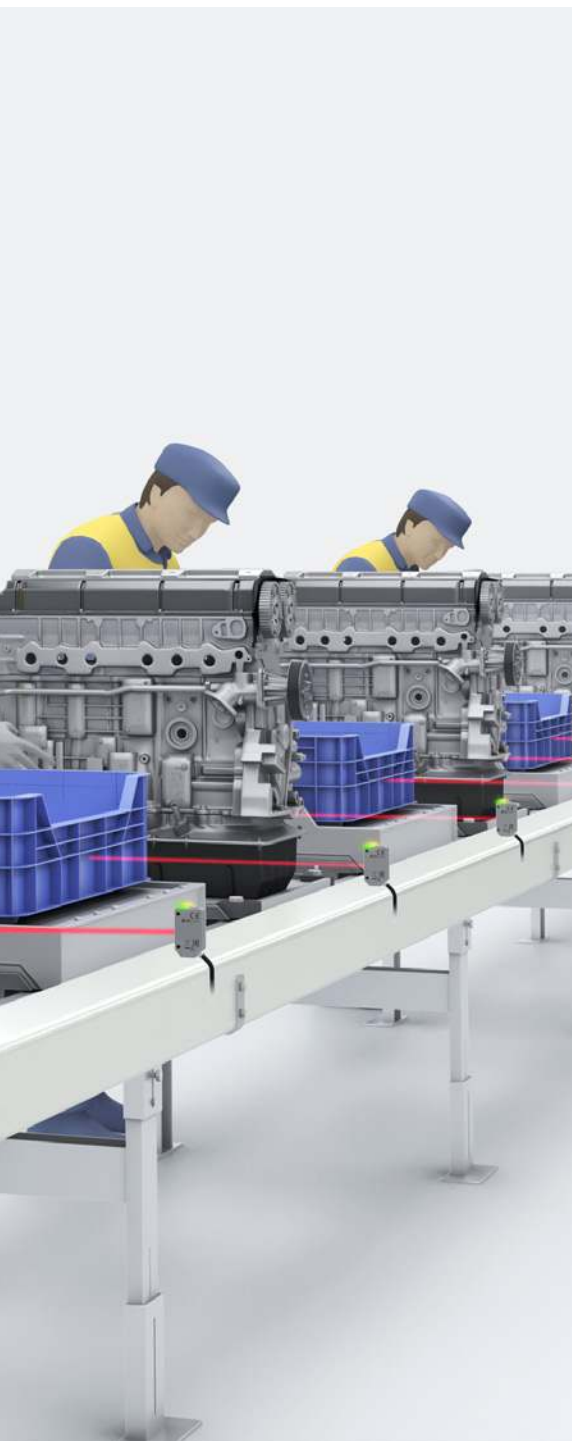
Because of their large sizes, conventional long-distance reflective sensors were limited in where they could be installed. E3AS-F Sensors have been significantly downsized, allowing them to be installed in various locations, providing more design flexibility.

Free from installation restrictions on assembly lines

Previously, installing sensors in the assembly area ran the risk of their colliding with tools and workpieces, causing sensor failures or optical axis misalignment, both of which would lead to false detections. E3AS-F Sensors, with their long sensing distances, can detect objects from outside the assembly area, effectively reducing the frequency of line stoppages caused by unnecessary problems. Their compact size allows them to be installed in various locations.



E3AS-F1□□□M



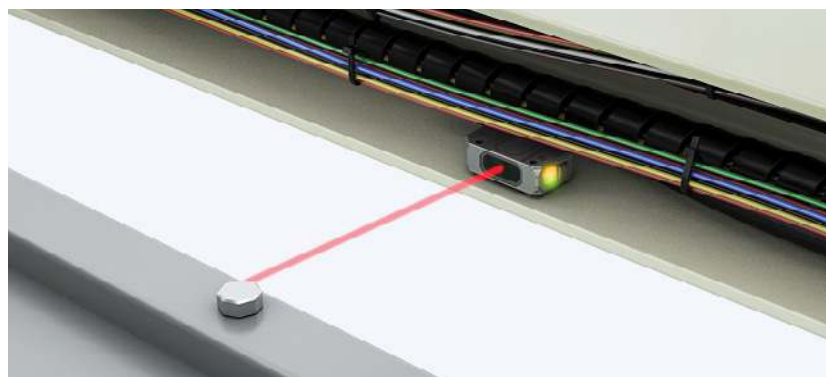
Wide sensing range to address changes in workpiece sizes

Conventional photoelectric sensors needed to be moved or replaced when the distance between the sensor and the workpiece changed. E3AS-F Sensors, with their 50 to 1,500 mm sensing range, can be used without replacement even if a new workpiece is added for detection.



TOF method to detect various workpieces

With conventional photoelectric sensors, prior evaluation was required for each workpiece to be detected. E3AS-F Sensors detect workpieces varying in colors and materials by the set distance, help reduce evaluation and adjustment time. They are unaffected by color variations that may be caused by workpiece contamination, and do not detect workers working near the line by mistake.



Small enough to be added to confined spaces

Conventional photoelectric sensors, because of their large sizes, could not be newly added to a line without modifying the line itself. E3AS-F Sensors can be installed in various locations, making sensor addition easier.

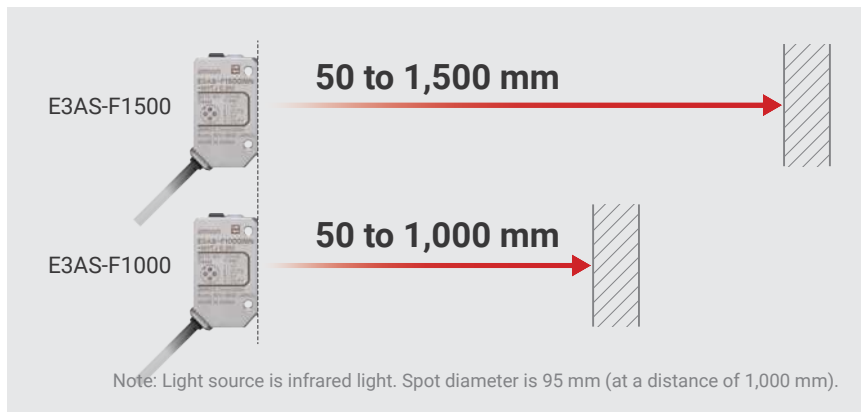
Reduce selection/commissioning time

Two types to choose from, according to installation environments

Offered in two types of cases: metal or resin. Their sensing ranges are the same.



Actual size W 11.4 x D 22 x H 37.9 mm



Short-distance sensing models also available

Equipped with OMRON's unique light emitting element for stable detection of workpieces 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

One-touch teaching to prevent inconsistent settings

Anyone can easily and consistently set the optimal threshold level just by pressing the teaching button.



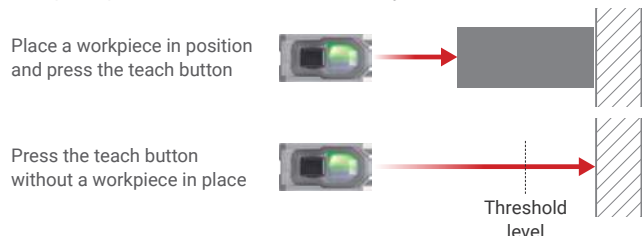
Teaching without a workpiece

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



Two-point teaching

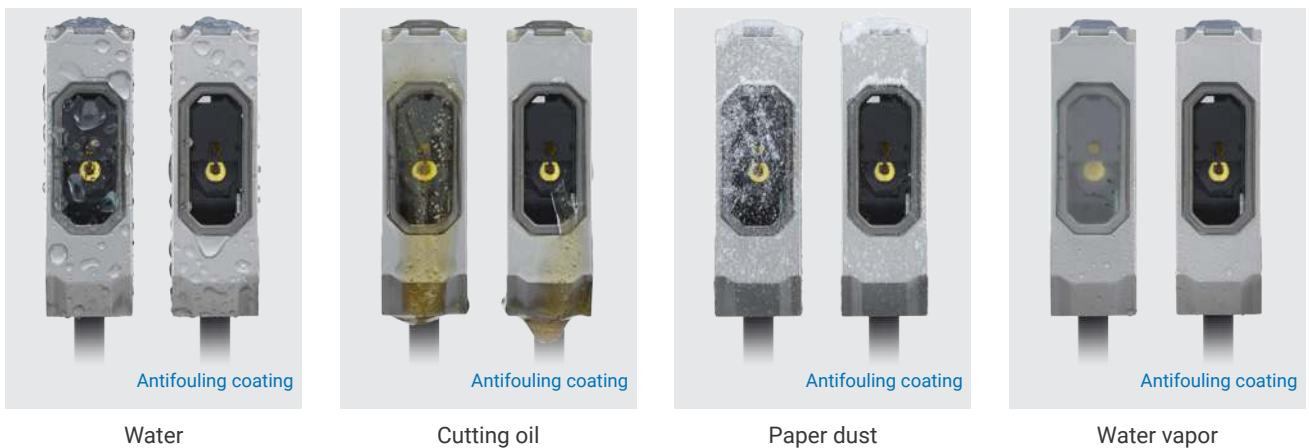
Sets the threshold at a value halfway between that when a workpiece is present and that when one is not. Settings can be done with the workpiece present first or in the reverse way.



Reduce sensor cleaning time and replacement frequency

Antifouling coating prevents contamination on the sensing surface Industry First Patent Pending^{*1}

Dirty sensing surface can cause false detection due to the principle of photoelectric sensors. E3AS Series with the antifouling coating on the sensing surface, which is the industry's first, prevents water droplets, oil, and dust from sticking to the sensing surface, and keeps the lens from fogging as well. Therefore, the coating prevents contamination on the sensing surface in environments where oil or dust scatters, or steam generates. False detection and cleaning frequency are also reduced.



Laser welding technologies for different materials/metals for increased environmental resistance

The sensor case is made of stainless steel (SUS316L). OMRON's two unique technologies, laser welding technology for different materials and laser welding technology for metals, enhanced the sealing and adhesion between the stainless steel and resin.

IP69K High temperatures/
high water pressure

IP69G Oil resistance

ECOLAB Detergent
resistance

Laser welding technology for different materials Patented^{*1}

It is a technology to weld different materials, resin and metal, using laser beams. Small holes are bored into the metal case, then melt the resin part by laser. The melted resin fills the holes for secure sealing and adhesion.

Laser welding technology for metals

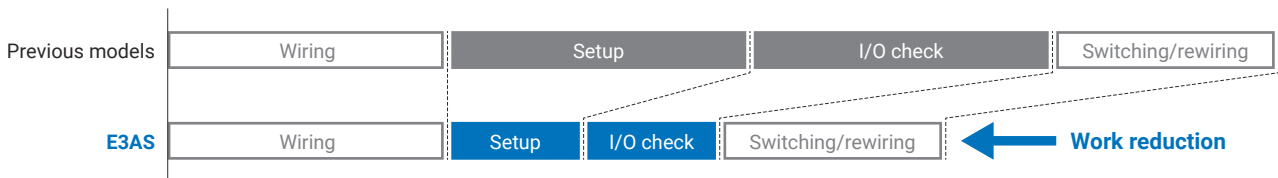
The metal case and cover are welded by a laser beam to seal the gaps. This provides higher airtightness compared to adhesives, keeping out water, oil, and other substances to reduce failures.

^{*1}. "Patent pending" means that we applied for a patent in Japan, and "Patented" means that we obtained a patent in Japan. (As of August 2019)

Reduce commissioning and change overtime

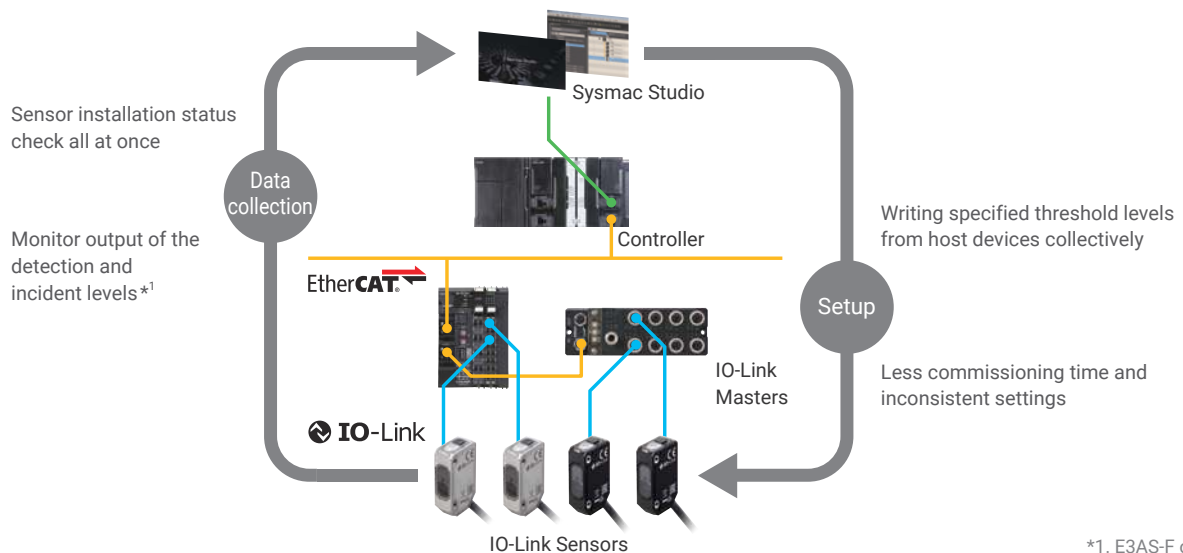
IO-Link dramatically reduces commissioning time

IO-Link enables batch-writing of sensor setting 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 the line.



Setup Setting all sensors from a host device at the same time

Sensor setting information can be batch-written, eliminating the need to set a large number of sensors one by one at sites.



I/O check ID check prevents installation mistakes

Sensor IDs can be collectively checked, making it easy for users to check misconnected or unconnected sensors, and installation mistakes.



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