

Distance-settable Photoelectric Sensor TOF Laser Sensor

E3AS-F Series

Optimal sensing distance (50 to 1,500 mm) for use on conveyor lines

- Wide sensing distance of 50 to 1,500 mm*, enabling use on any conveyor line width
- Time of flight (TOF) type sensors for use with any type of conveyed object
- Compact body can be mounted anywhere
- (Metal body (SUS316L), Plastic body type (PBT/PC))
- Teaching method allows anyone to set optimal threshold values
- Manufactured using Omron's proprietary laser sealing method (IP67/IP69K/IP67G)
- Antifouling coatings reduce the cleaning frequency on the lens.
- IO-Link reduces time required for startups and changeovers

* The sensing distance of the E3AS-F1500 series.



Refer to *Safety Precautions* on page 9.



For the most recent information on models that have been certified for safety standards, refer to your Omron website.

Ordering Information

Sensors [Refer to *Dimensions* on page 11.]

SUS 316L Body

Infrared light

Connection method	Sensing distance (white paper)	Output	NPN output ---	Model	
		IO-Link baud rate		PNP output COM2 (38.4 kbps)	PNP output COM3 (230.4 kbps)
Pre-wired (2 m) ¹			E3AS-F1500IMN 2M	E3AS-F1500IMD 2M	E3AS-F1500IMT 2M
M8 Connector			E3AS-F1500IMN M3	E3AS-F1500IMD M3	E3AS-F1500IMT M3
M8 Pre-wired Connector			E3AS-F1500IMN-M3J 0.3M	E3AS-F1500IMD-M3J 0.3M	E3AS-F1500IMT-M3J 0.3M
M12 Pre-wired Connector ²			E3AS-F1500IMN-M1TJ 0.3M	E3AS-F1500IMD-M1TJ 0.3M	E3AS-F1500IMT-M1TJ 0.3M
Pre-wired (2 m) ¹			E3AS-F1000IMN 2M	E3AS-F1000IMD 2M	E3AS-F1000IMT 2M
M8 Connector			E3AS-F1000IMN M3	E3AS-F1000IMD M3	E3AS-F1000IMT M3
M8 Pre-wired Connector			E3AS-F1000IMN-M3J 0.3M	E3AS-F1000IMD-M3J 0.3M	E3AS-F1000IMT-M3J 0.3M
M12 Pre-wired Connector ²			E3AS-F1000IMN-M1TJ 0.3M	E3AS-F1000IMD-M1TJ 0.3M	E3AS-F1000IMT-M1TJ 0.3M

PBT Body

Connection method	Sensing distance (white paper)	Output	NPN output ---	Model	
		IO-Link baud rate		PNP output COM2 (38.4 kbps)	PNP output COM3 (230.4 kbps)
Pre-wired (2 m) ¹			E3AS-F1500IPN 2M	E3AS-F1500IPD 2M	E3AS-F1500IPT 2M
M8 Connector			E3AS-F1500IPN M3	E3AS-F1500IPD M3	E3AS-F1500IPT M3
M8 Pre-wired Connector			E3AS-F1500IPN-M3J 0.3M	E3AS-F1500IPD-M3J 0.3M	E3AS-F1500IPT-M3J 0.3M
M12 Pre-wired Connector ²			E3AS-F1500IPN-M1TJ 0.3M	E3AS-F1500IPD-M1TJ 0.3M	E3AS-F1500IPT-M1TJ 0.3M
Pre-wired (2 m) ¹			E3AS-F1000IPN 2M	E3AS-F1000IPD 2M	E3AS-F1000IPT 2M
M8 Connector			E3AS-F1000IPN M3	E3AS-F1000IPD M3	E3AS-F1000IPT M3
M8 Pre-wired Connector			E3AS-F1000IPN-M3J 0.3M	E3AS-F1000IPD-M3J 0.3M	E3AS-F1000IPT-M3J 0.3M
M12 Pre-wired Connector ²			E3AS-F1000IPN-M1TJ 0.3M	E3AS-F1000IPD-M1TJ 0.3M	E3AS-F1000IPT-M1TJ 0.3M

1. Models with 5-m cable length are also available with "5M" suffix. (Example: E3AS-F1500IMN 5M/E3AS-F1500IPN 5M)

2. The Pre-wired Connector (M12) is Smartclick Connector.

E3AS-F Series

Accessories (Sold Separately)

Sensor I/O Connectors (Sockets on One Cable End)

(Models for Connectors / Pre-wired Connectors)

A Sensor I/O Connector is not provided with the Sensor. Order separately.

Round Water-resistant Connectors XS3F-M8 series

Appearance	Cable specification	Cable diameter (mm)	Cable connection direction	Cable length (m)	Sensor I/O Connector model number
M8 Connector	PVC cable	5 dia.	Straight	2	XS3F-M8PVC4S2M
Straight type				5	XS3F-M8PVC4S5M
			Right-angle	2	XS3F-M8PVC4A2M
				5	XS3F-M8PVC4A5M

Note: 1. The XS3W (Socket and Plug on Cable Ends) is also available. Refer to XS3W-M8/XS3F-M8 Series Datasheet (Cat. No. G140).

2. The connectors will not rotate after they are connected.

3. The cable is fixed at an angle of 180° from the sensor emitter/receiver surface.

Round Water-resistant Connectors XS5 series

Appearance	Cable specification	Cable diameter (mm)	Cable connection direction	Cable length (m)	Sensor I/O Connector model number
M12 Smartclick Connector	PVC robot cable	6 dia.	Straight	2	XS5F-D421-D80-F
Straight type				5	XS5F-D421-G80-F
			Right-angle	2	XS5F-D422-D80-F
Right-angle type				5	XS5F-D422-G80-F
					

Note: 1. The XS5W (Socket and Plug on Cable Ends) is also available. Refer to XS5 on your Omron website for details.

2. The connectors will not rotate after they are connected.

3. The cable is fixed at an angle of 180° from the sensor emitter/receiver surface.

Mounting Brackets [Refer to *Dimensions* on page 12.]

A Mounting Bracket is not enclosed with the Sensor. Order as needed.

Appearance	Model (material)	Applicable Sensor E3AS series			
		Pre-wired	M8 Pre-wired Connector	M12 Pre-wired Smartclick Connector	M8 Connector
L-shaped Mounting Bracket 	E39-L201 (SUS304)	Yes	Yes	Yes	---
Horizontal Protective Cover Bracket 	E39-L202 (SUS304)	Yes	Yes	Yes	---
Rear Mounting Bracket 	E39-L203 (SUS304)	Yes	Yes	Yes	Yes ²
Robust Mounting Bracket 	E39-L204 (SUS304)	Yes	Yes	Yes	---
L-shaped Mounting Bracket 	E39-L211 (SUS304)	--- ¹	--- ¹	--- ¹	Yes ³
Horizontal Protective Cover Bracket 	E39-L212 (SUS304)	--- ¹	--- ¹	--- ¹	Yes ³
Robust Mounting Bracket 	E39-L214 (SUS304)	--- ¹	--- ¹	--- ¹	Yes ³

1. Can be used for Pre-wired models, M8 Pre-wired Connector models, and M12 Pre-wired Smartclick Connector models. However, confirm the bracket shape in advance.

2. Confirm the installation environment and bracket shape of the Sensor I/O Connector to be connected.

3. Use an L-shaped Sensor I/O Connector. Straight types cannot be installed.

E3AS-F Series

Ratings and Specifications

Model		Sensing method	TOF (Time of flight)	
		Type	Metal case (□: M), Plastic case (□: P)	
		NPN output	E3AS-F1500I□N	E3AS-F1000I□N
		PNP output/ COM2	E3AS-F1500I□D	E3AS-F1000I□D
Item	PNP output/ COM3		E3AS-F1500I□T	E3AS-F1000I□T
Sensing distance			50 mm to the set distance (White paper or black paper 200 × 200 mm)	50 mm to the set distance (White paper or black paper 200 × 200 mm)
Setting range			100 to 1,500 mm (White paper 200 × 200 mm) 100 to 1,000 mm (Black paper 200 × 200 mm)	100 to 1,000 mm (White paper 200 × 200 mm) 100 to 500 mm (Black paper 200 × 200 mm)
Spot diameter (reference value)			95 mm dia. (at distance of 1,000 mm)	
Differential travel			15% max. of set distance (Set distance 200 mm min.)	
Reflectivity characteristic (black/white error)			10% max. of set distance (Set distance 200 mm min.)	
Light source (wavelength)			Infrared laser (940 nm) Class1 (IEC/EN60825-1:2014)	
Power supply voltage			10 to 30 VDC (including 10% ripple (p-p)), Class2	
Current consumption			30 mA max.	
Input/output	Control output		Load power supply voltage: 30 VDC max., Class2, Load current: 100 mA max. (Residual voltage: Load current of less than 10 mA: 1 V max. Load current of 10 to 100 mA: 2 V max.) Open-collector output (NPN/PNP output depending on model)	
	NPN		OUTPUT 1: NO (Normally open), OUTPUT 2: NC (Normally closed)	
	PNP/COM2 PNP/COM3		OUTPUT 1: NO (Normally open)/COM□, OUTPUT 2: NC (Normally closed)	
Protection circuits			Power supply reverse polarity protection, Output short-circuit protection, and Output reverse polarity protection	
Response time			Operate or reset: 150 ms max.	Operate or reset: 90 ms max.
Distance setting			Teaching method/IO-Link communications	
Ambient illumination (Receiver side)			Incandescent lamp: 3,000 lx max., Sunlight: 10,000 lx max.	
Ambient temperature range			Operating: -20 to 55°C, Storage: -40 to 70°C (with no icing or condensation)	
Ambient humidity range			Operating: 35% to 85%, Storage: 35% to 95% (with no condensation)	
Insulation resistance			20 MΩ min. at 500 VDC	
Dielectric strength			1,000 VAC, 50/60 Hz for 1 min	
Vibration resistance			10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions	
Shock resistance			500 m/s ² for 3 times each in X, Y, and Z directions	
Degree of protection			IP67 (IEC60529) and IP67G ¹ (JIS C 0920 Annex 1), IP69K (ISO20653)	
Indicators			Operation indicator (orange), stability/communication indicator (green ²)	
Connection method			Pre-wired (standard cable length: 2 m), M8 Connector, M8 Pre-wired Connector (standard cable length: 0.3m), M12 Pre-wired Smartclick Connector (standard cable length: 0.3m)	
Weight (packed state/ Sensor only)	Pre-wired (2 m)		Metal case type: Approx. 135 g/approx. 90 g Plastic case type: Approx. 115 g/approx. 70 g	
	M8 Connector		Metal case type: Approx. 75 g/approx. 30 g Plastic case type: Approx. 60 g/approx. 15 g	
	M8 Pre-wired Connector (0.3m)		Metal case type: Approx. 85 g/approx. 40 g Plastic case type: Approx. 70 g/approx. 25 g	
	M12 Pre-wired Smartclick Connector (0.3m)		Metal case type: Approx. 95 g/approx. 50 g Plastic case type: Approx. 75 g/approx. 30 g	
Materials	Case		Metal case type: Main unit/mounting part/connector part Stainless steel (SUS316L) Plastic case type: Main unit Polybutylene terephthalate (PBT) /polycarbonate (PC), Mounting part/connector part Nickel-plated brass	
	Lens		Methacrylate resin (PMMA)	
	Display		Metal case type: Polyamide 11 (PA11) Plastic case type: Polyethersulfone (PES)	
Main IO-Link functions			Operation mode switching between NO and NC, execution of teaching (2-point teaching, Background teaching), setup of the threshold, timer function of the control output and timer time selecting, monitor output (Detection level, Incident light level), Restore Factory Settings, Key Lock (Unlock, Lock, Lock (No Button))	
IO-Link Communication specifications	IO-Link specification		Ver. 1.1	
	Baud rate		COM2 (38.4 kbps), COM3 (230.4 kbps)	
	Data length		PD size: 4 bytes, OD size: 1 byte (M-sequence type: TYPE_2_V)	
	Minimum cycle time		COM2: 3.5 ms, COM3: 1.2 ms	
Accessories			Instruction manual, compliance sheet, index list (attached for IO-Link type only) and FDA certification label Note: Mounting Brackets must be ordered separately.	

1. The IP67G is the degree of protection which is defined according to the JIS (Japanese Industrial Standards). The IP67 indicates the same level of protection as defined by the IEC, and the G indicates that a device has resistance to oil.

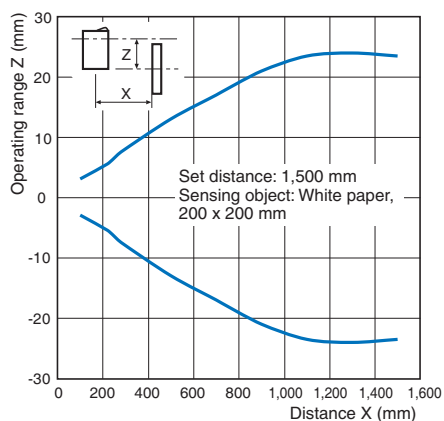
2. IO-Link mode: blinking

Engineering Data (Reference Value)

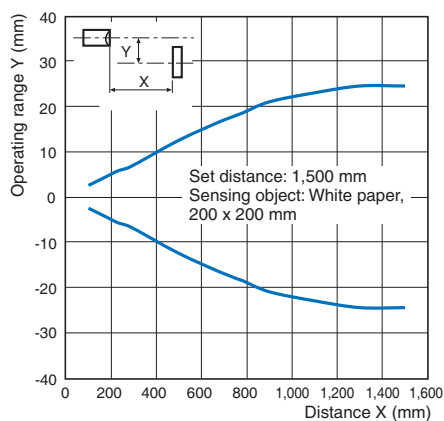
Operating Range

E3AS-F1500□

Z directions

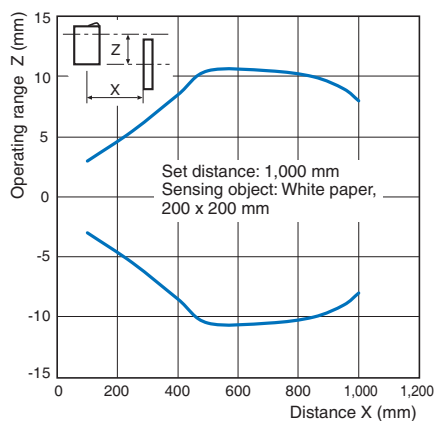


Y directions

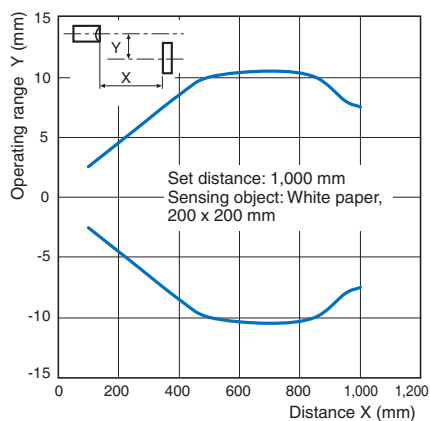


E3AS-F1000□

Z directions



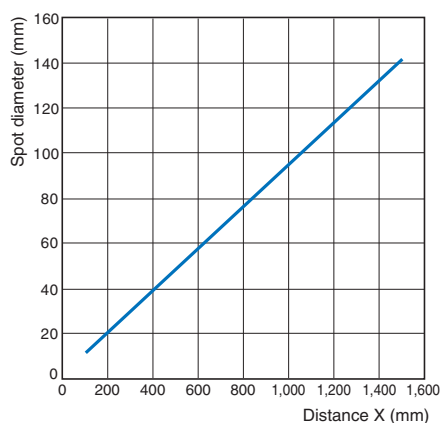
Y directions



Spot Diameter vs. Sensing Distance

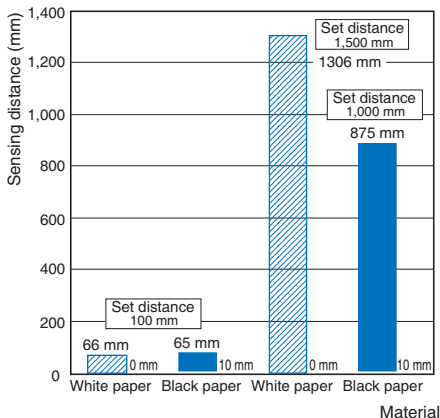
E3AS-F1500□

E3AS-F1000□

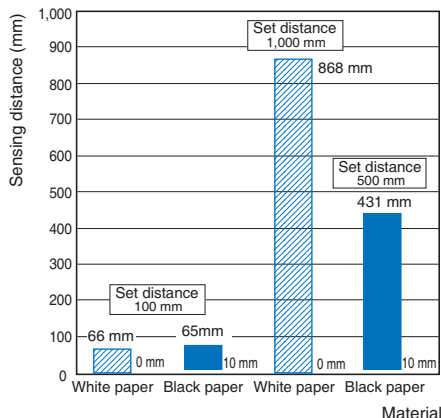


Close-range Characteristics

E3AS-F1500□

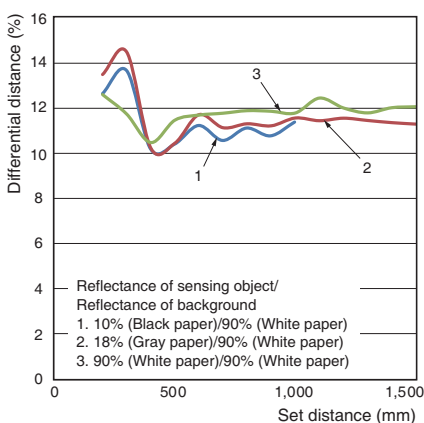


E3AS-F1000□

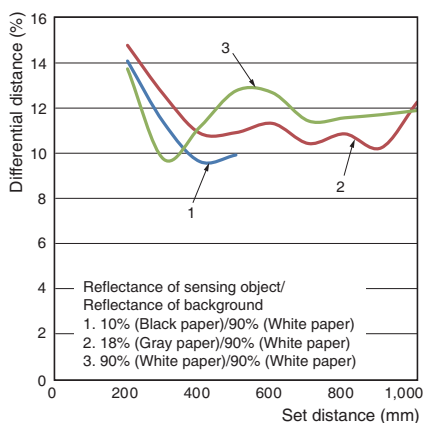


Differential distance for each sensing object Vs. Distance

E3AS-F1500□



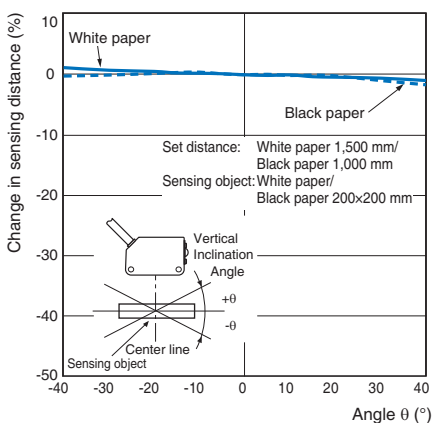
E3AS-F1000□



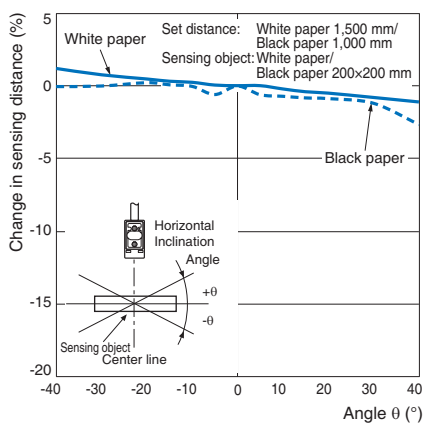
Sensing Object Angle Characteristics

E3AS-F1500□

Vertical

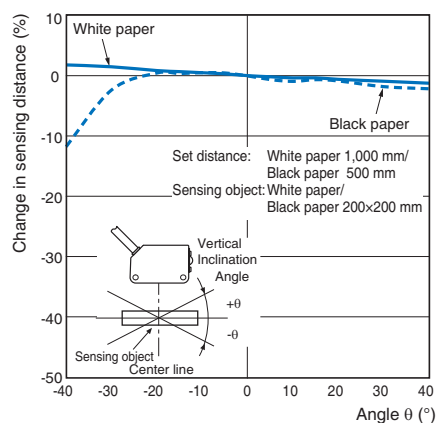


Horizontal

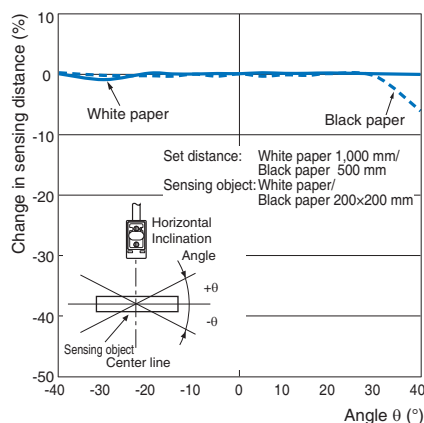


E3AS-F1000□

Vertical



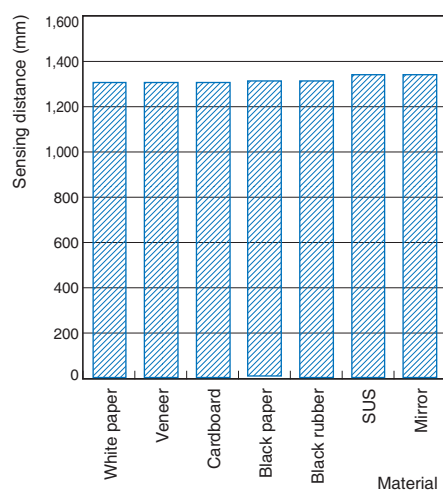
Horizontal



Sensing Distance vs. Sensing Object Material

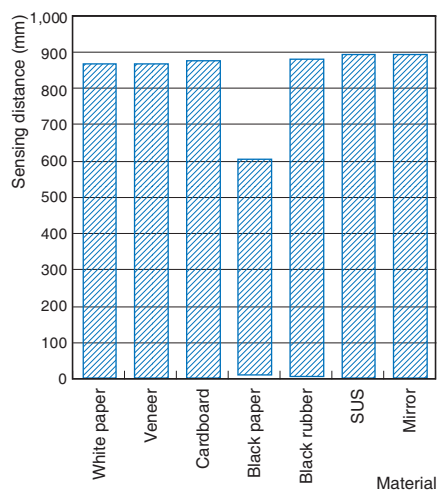
E3AS-F1500□

(Set Distance of 1,500 mm using White Paper)



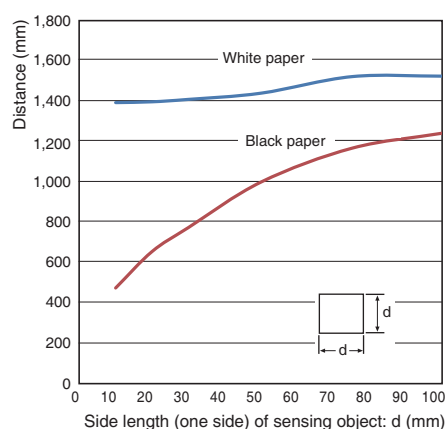
E3AS-F1000□

(Set Distance of 1,000 mm using White Paper)

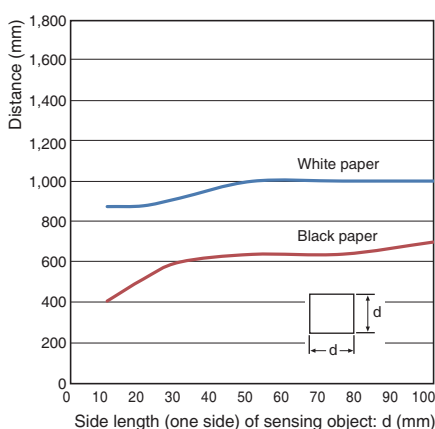


Sensing Object Size vs. Sensing Distance

E3AS-F1500□



E3AS-F1000□



E3AS-F Series

I/O Circuit Diagrams/ Timing Charts

NPN Output

Model	Timing chart	Output circuit
E3AS-F1500□□N□ E3AS-F1000□□N□		

* The initial value of control output 2 is reverse of control output 1.

PNP Output

Model	Output circuit	
	Standard I/O mode (SIO mode) ¹	IO-Link Communication mode (COM mode) ²
E3AS-F1500□□D□ E3AS-F1500□□T□ E3AS-F1000□□D□ E3AS-F1000□□T□		

1. Standard I/O mode is used as PNP ON/OFF output.
2. IO-Link Communication mode is used for communications with the IO-Link Master. C/Q performs IO-Link communications. Sensor output DO performs ON/OFF output.

Timing charts	
Output mode	
Standard I/O mode (SIO mode)	
IO-Link Communication mode (COM mode)	

- 1 The initial value of control output 2 is reverse of control output 1.
2. The timer function of the control output can be set up by the IO-Link communications. (It is able to select ON delay, OFF delay, or one-shot function and select a timer time of 1 to 9,999 ms (T).)

ON delay		OFF delay		One Shot	
Sensing object	Present	Sensing object	Present	Sensing object	Present
NO	ON 1	NO	ON 1	NO	ON 1
NC	ON 1	NC	ON 1	NC	ON 1
	OFF 0		OFF 0		OFF 0

Please contact your Omron sales representative regarding the IO-Link setup file (IODD file).

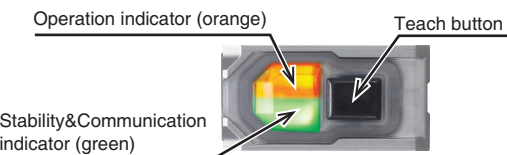
Note: Shown above are the factory settings. Refer to the index list for the default settings at time of shipment from factory.

PNP/COM output logic can be reversed by IO-Link communication.

The operation indicator (orange) lights up when control output 1 is ON or communication output is 1.

Nomenclature

E3AS-F1500□
E3AS-F1000□



Note: The indicators work differently depending on sensor status.