

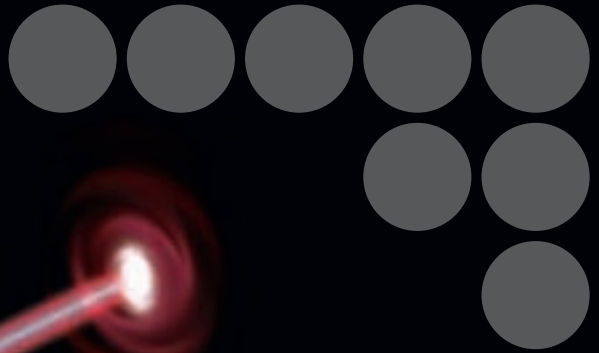
OMRON

NEW

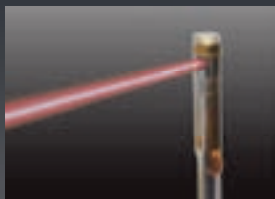
Digital Fiber Sensors

E3X-DA-S

Tough Fiber



The No. 1 Fiber Sensor
in the World
Five unmatched features!



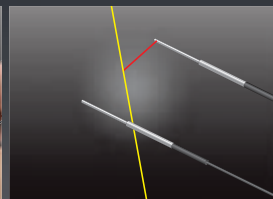
No. 1 Margin in
Incident Level



No. 1 Sensing Distance



No. 1 Insertion Stability



No. 1 Ability to
Detect Small Objects



No. 1 in
Saving Energy

realizing



For further information on the performance capabilities of the Sensor, visit the following site: <http://www.ia.omron.com>

The fiber light beams
are depicted as images.

The No. 1 Performance in the World

Five unmatched features achieved through the most stable detection capabilities.

By pursuing world-class technology and the most stable detection performance, OMRON provides a substantial margin and reliability on all elements required for detection.



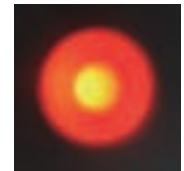
A 160 Times the Incident Level for the Most Stable Detection Performance in the World

The E3X-DA-S Digital Fiber Sensor increases the level of emitted light up to 4 times (compared with previous models) with increased reliability in environments with dirt and dust.

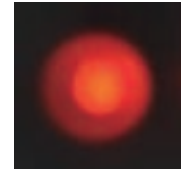
A significant improvement in the optical coupling efficiency and 4 times the level of emitted light make stable detection possible even in bad environments, reducing the work required for maintenance and adjustments. By using Tough Mode and power tuning, the incident level can be increased 160 times in comparison with previous models.



New E3X-DA-S



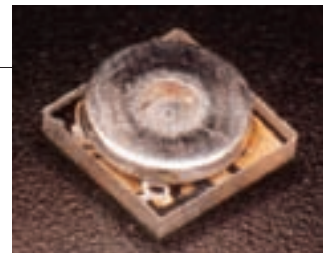
Previous Sensors



Technology

OMRON's Unique High-efficiency Coupling Element Controls the Light

OMRON has developed a light-emitting device with over four times the power of previous devices by combining technical know-how accumulated over year of experience with newly developed optical and manufacturing technology.



Four Strong Points Support the High-efficiency Coupling Element

Development of New Optical Technology Patent Pending

The light-emitting element and fiber are coupled with high efficiency by combining a minute lens and mirror with great accuracy, and optimally controlling the directional angle of the light output by the LED.

Alignment Technology for Minute Optical Systems Patent Pending

OMRON has developed unique alignment technology for positioning components and specialized facilities to precisely assemble micro-optical components.

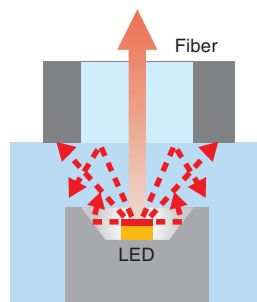
Laminated Mounting Technology for Reflectors and LEDs Patent Pending

Highly accurate laminated mounting of high-luminance LEDs in the reflector that was newly designed to couple with the fiber enables more efficient control of light and enables downsizing devices.

LED Packaging Technology

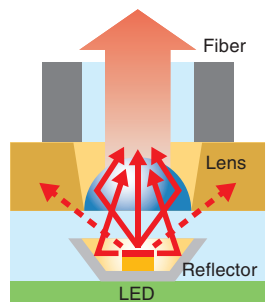
Low loop wire bonding technology and highly reliable, ultra-thin packaging technology support the performance of the highly efficient coupling element.

Coupling efficiency: 10%



Previous Sensors

Coupling efficiency: 40%

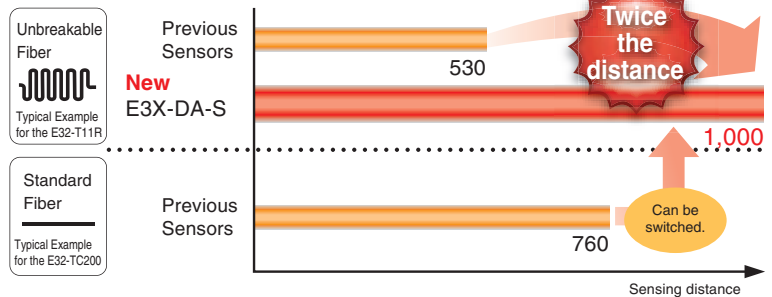


E3X-DA21-S

02 Twice the Sensing Distance

The longest sensing distance available. And stable long-distance detection is possible even with flexible or extremely thin fibers.

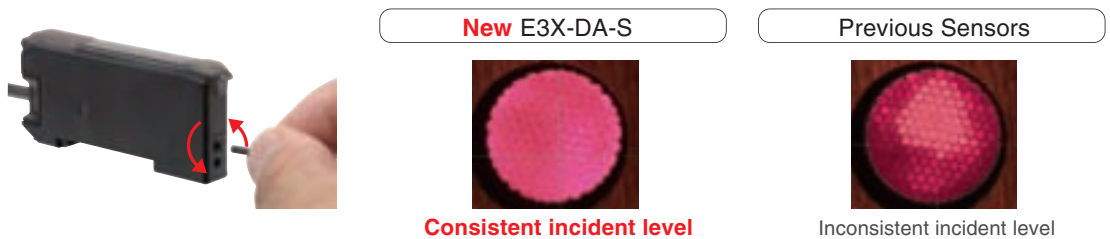
Although normally flexible and extremely thin fibers make stable detection difficult at long distances due to insufficient light, OMRON has doubled the sensing distance to enable stable long-distance detection. Even applications using standard fibers can be switched to flexible or extremely thin fibers, without having to worry about the light level.



03 Variations in the Incident Level during Fiber Insertion Reduced to Half

The variations in the incident level during insertion of the fiber are reduced to half through uniform distribution of the light.

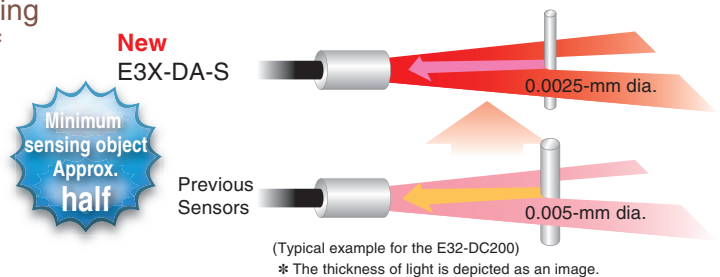
Depending on how a flexible or extremely thin fiber is installed, there may be variations in the incident level. However, using a light-emitting device to uniformly control the amount of light coupled with the fiber reduces the variations in the incident level to half, and the adjustment and maintenance work required during installation of the Sensor is also reduced.



04 Minimum Sensing Object Reduced to Half

Further development of signal processing technology ensures stable detection of minute objects.

In addition to a substantial increase in the incident level, further improvements in the precision of OMRON's unique signal processing technology have enabled the detection of objects half the size of those that could be detected with previous models.

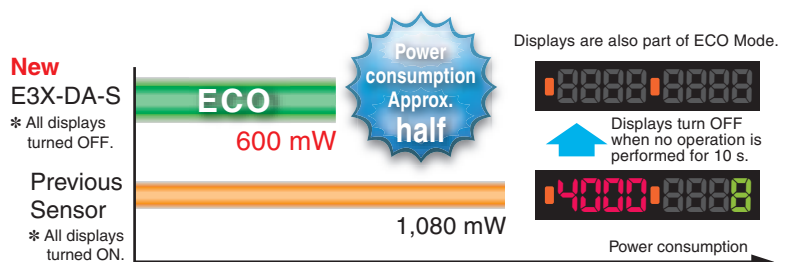


05 Uses Only Half the Energy

Power consumption has been reduced to half* in comparison with previous models in due consideration of environmental issues.

(* When using ECO2 Mode.)

The sensing efficiency has been maximized, and the power consumption at the same sensing distance has been reduced to almost half* of that of previous models. Also, the use of parts conforming to the RoHS Directive ensures environmental friendliness.



Easily Set the Optimum Incident Level

The E3X-DA-S Digital Fiber Sensor is equipped with a power tuning function that lets you set the optimum incident level with a single button.

The incident level can be set without switching the mode.

Troublesome power adjustments are not required. Just press the MODE Key once, and the power tuning function shifts the power level so that the incident level is set to the optimum value.*

* The optimum value can be set to between 100 and 3,900.

Variations eliminated between different Sensors.

By adjusting variations in digital displays for the same application, the same threshold value can be set for all Sensors, so that you can visually detect troubles on the displays.

Up to 5-fold increase

Press

Up to 1/20 reduction

Press

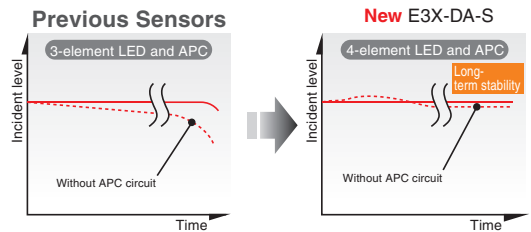
Digital incident levels vary due to individual differences in the Sensors, so the threshold levels must be set individually.

All of the Amplifiers are set to the same digital incident level, so the same threshold level can be set and maintained for the Sensors.

Long-term, Stable Performance

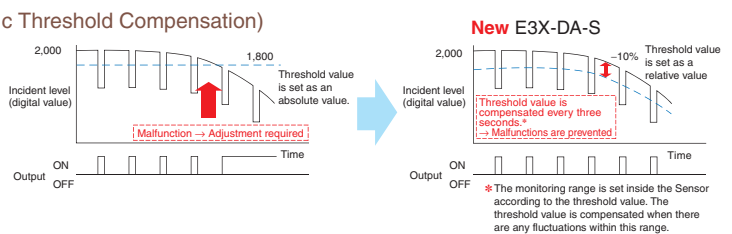
The number 1 long-term stable detection (patented) for which OMRON Sensors are known has been inherited through the use of 4-element LEDs and an APC (Auto Power Control) circuit.

The E3X-DA-S Digital Fiber Sensor uses OMRON's unique APC circuit and LEDs to prevent deterioration over time, achieving the industry's most stable long-term detection performance. OMRON Sensors can be used with high stability, regardless of whether the APC circuit is ON or OFF.



World First OMRON's Unique ATC (Automatic Threshold Compensation)

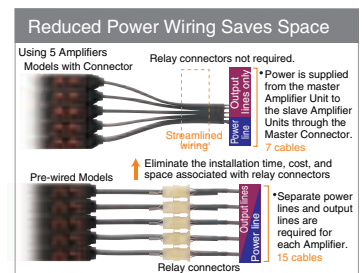
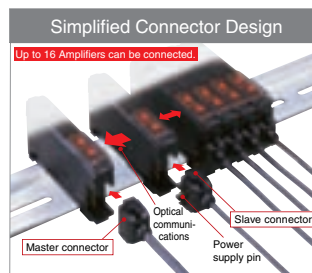
Malfunctions due to the dust and dirt in the workplace are prevented to help improve the operating rate of the equipment. OMRON's unique algorithm automatically compensates the threshold value to help achieve long-term stable detection.



Easy-to-use Amplifier Unit Connector

Improve efficiency using OMRON's unique Amplifier Unit Connector.

- (1) Wiring work is significantly reduced and less space is used.
- (2) Stock costs can be reduced because it is not necessary to distinguish between master connectors and slave connectors on the Amplifiers.
- (3) Maintenance work is reduced because you can replace just the Sensor.



Many Functions for Even More Applications

Remote input function can control the Sensor remotely.

Input signals can make various remote settings, such as teaching operations, power tuning, and emitter OFF. Teaching during process switchovers is also supported, and you can check operation before starting operation.

Area output function can be used for range judgments.

Judgment of heights, lengths, or other dimensions can be done with a single Sensor.



Lineup of Fiber Amplifiers for A Wide Range of Applications

Standard Models (Typical model: E3X-DA21-S)

NEW

Pre-wired Models

Models with Connectors

NEW

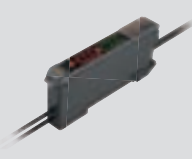
Full Color Models (Typical model: E3X-DAC11-S)

Two-channel Models (Typical model: E3X-MDA11)


Previous Models (Typical model: E3X-DA11-S)

Amplifier Units

Pre-wired Models

Appearance	Functions	Model	
		NPN output	PNP output
	Timer Tough Mode Differential operation External input Twin output Self-diagnosis ATC	E3X-DA21-S 2M	E3X-DA51-S 2M

Models with Connectors

Appearance	Functions	Model	
		NPN output	PNP output
	Timer Tough Mode Differential operation Twin output Self-diagnosis ATC	E3X-DA7-S	E3X-DA9-S

* The applicable connectors are the E3X-CN21 (master connector with four conductors) and E3X-CN22 (slave connector with two conductors).

Ratings and Specifications

Item	Model	E3X-DA□-S (□: 21/51/7/9)
Light source (wavelength)	Red LED (625 nm)	
Power supply voltage	12 to 24 VDC ±10%, ripple (p-p) 10% max.	
Power consumption	Normal: 960 mW max. (Current consumption: 40 mA max. at 24 VDC, 80 mA max. at 12 VDC) Power saving ECO1: 720 mW max. (Current consumption: 30 mA max. at 24 VDC, 60 mA max. at 12 VDC) Power saving ECO2: 600 mW max. (Current consumption: 25 mA max. at 24 VDC, 50 mA max. at 12 VDC)	
Control output	Load power supply voltage: 26.4 VDC max.; Open-collector output (models available for NPN or PNP output); Load current: 50 mA max. (Residual voltage: 2 V max.); OFF current: 0.5 mA max.	
External input *1	No-voltage input (contacts/transistor) *2	
Protection circuits	Reverse polarity for power supply connection, output short-circuit, Reversed output polarity protection	
Response time (operate and reset)	Super-high-speed Mode *3: 80 μs; High-speed Mode: 250 μs; Standard Mode: 1 ms; High-resolution mode: 4 ms; Tough Mode: 16 ms	
Sensitivity adjustment	Teaching or manual method	
Functions	Power tuning	Light emission power and reception gain, digital control method
	Differential detection	Switchable between single edge and double edge detection mode Single edge: Can be set to 250 μs, 500 μs, 1 ms, 10 ms, or 100 ms. Double edge: Can be set to 500 μs, 1 ms, 2 ms, 20 ms, or 200 ms.
	Timer function	Select from OFF-delay, ON-delay, one-shot, or ON-delay + OFF-delay timer. 1 ms to 5 s (1 to 20 ms set in 1-ms increments, 20 to 200 ms set in 5-ms increments, 200 ms to 1 s set in 100-ms increments, and 1 to 5 s set in 1 s-increments)
	Automatic power control (APC)	High-speed control method for emission current
	ATC (Automatic Threshold Compensation)	Supported
	Zero-reset	Negative displays are possible. (The threshold value also shifts.)
	Resetting settings	Select from initial reset (factory defaults) or user reset (saved settings).
	Mutual interference prevention	Up to 10 Units *4
	ECO mode *5	Select from lit display, dimmed display, or OFF.
	External input setting *1	Select from teaching operations, power tuning, zero reset, emitter OFF, or ATC start.
Output setting	Select from output for each channel, area output, or self-diagnosis.	
Display	Operation indicator for channel 1 (orange), Operation indicator for channel 2 (orange)	

*1. Only for pre-wired models.

*2. Refer to the datasheet (Cat. No. E336) for details on the input.

*3. The communications function and mutual interference prevention function are disabled if detection is set to Super-high-speed Mode.

*4. Mutual interference prevention can be used for only up to 6 Units if power tuning is enabled.

*5. When the ECO Mode is enabled, the rated sensing distance is approx. 1/2 and the incident level is approx. 1/3 of the normal levels.

Note: The E3X-MC11-SV2 Mobile Console does not currently support the new Tough Mode and ON-delay + OFF-delay timer. You also cannot use the E3X-MC11-S.

Sensing Distance (Typical Examples)

Type	Model	Tough Mode	High-resolution Mode	Standard Mode	High-speed Mode	Super-high-speed Mode		
Through-beam	Flexible	E32-T11R *1	2,000	1,400	1,000	700	280	
	Standard	E32-T21R *2	450	300	250	150	60	
Retro-reflective	Flexible	E32-TC200 *1	2,800	2,000	1,550	1,000	400	
		E32-D11R *3	840	600	350	240	100	
	Standard	E32-D21R *2	140	100	60	40	16	
		E32-DC200 *3	1,400	1,000	600	400	180	
		Co-axial and flexible	E32-CC200R *3	700	500	300	200	90
			E32-CC200 *3	1,400	1,000	600	400	180
Co-axial	E32-C31 *2	330	240	150	100	44		

*1. The appearance is same as models with M4 screws.

*2. The appearance is same as models with M3 screws.

*3. The appearance is same as models with M6 screws.

This document provides information mainly for selecting suitable models. Please read Instruction Sheet carefully for information that the user must understand and accept before purchase, including information on warranty, limitations of liability, and precautions.

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Printed in Japan