Smart Fiber Amplifier Unit
E3X-HD

CSM_E3X-HD_DS_E_7_4

Easy and optimum settings for anyone
Smart Fiber Amplifier Unit with Long-term Stable Detection

- Equipped with Smart Tuning, which automatically configures the settings to their optimum values with the press of a single button.
- Highly usable design enables anyone to configure the settings easily.
- Detects dirt, vibrations, and LED deterioration, and automatically compensates the incident level and the light intensity.
- Unparalleled best-in-class power provides stable detections for low-reflective workpieces and large workpieces (equipped with GIGA RAY II).

Refer to the *Fiber Sensors Technical Guide* and *Safety Precautions* on page 9.

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

Features

Easy

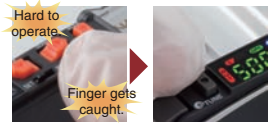
Greater operability and visibility are realized by a universal design

Operations

Symbolic buttons are easy to remember anywhere even for operators overseas.

Compatibility for easy operation and incorrect operation prevention.

Pleasing operation even with gloves on.



Conventional Models: Sliding switches

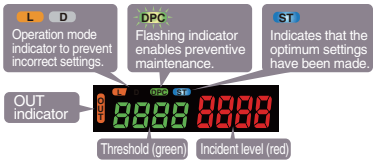
E3X-HD: Pushbutton switches (no sliding switches)

Arc Design

A strong accent line gives a compact look to improve equipment design

Indications

Visibility is improved with digital displays and visible indicators.
New Concept: Visible Indicators

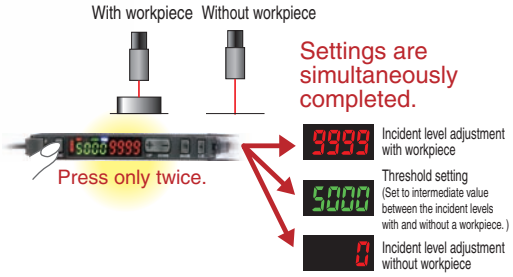


Smart Tuning

Smart tuning for the optimum settings with just one button.

Smart Tuning

Automatically configure the settings to their optimum values with the press of a single button.

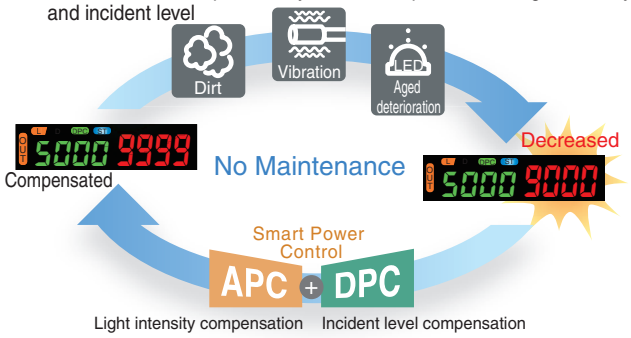


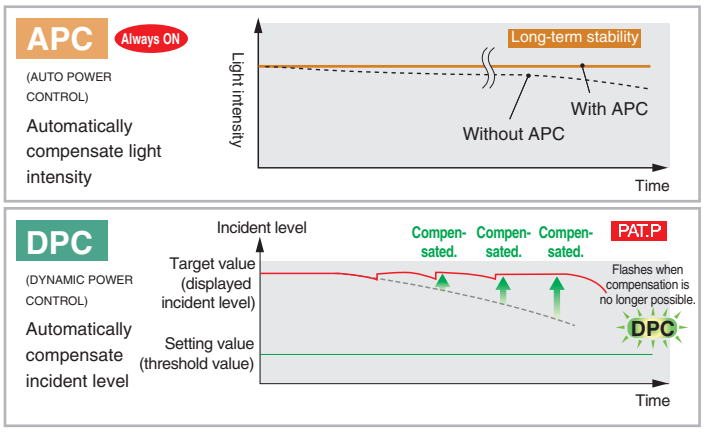
Stable

Long-term stable detection with no maintenance

Smart Power Control

Maintenance-free operation by double compensation of light intensity and incident level





Ordering Information

Fiber Amplifier Units

Standard models (Dimensions → page 12)

Appearance	Connecting method	Models	
		NPN output	PNP output
	Pre-wired (2 m)	**E3X-HD11 2M**	**E3X-HD41 2M**
	Wire-saving Connector	**E3X-HD6**	**E3X-HD8**
	M8 Connector	**E3X-HD14**	**E3X-HD44**

Model for Sensor Communications Unit (Dimensions → page 12)

Appearance	Model	Applicable Sensor Communications Unit
	**E3X-HD0**	**E3X-ECT**
		E3X-CRT

Accessories (sold separately)

Wire-saving connectors (Required for models for Wire-saving Connectors.)

Connectors are not provided with the Fiber Amplifier Unit and must be ordered separately. * Protective stickers: provided.

Type	Appearance	Cable length	Number of conductors	Models
Master Connector		2 m	3	**E3X-CN11**
Slave Connector			1	**E3X-CN12**

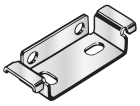
Sensor I/O Connectors (Required for models with M8 Connectors.)

Connectors are not provided with the Fiber Amplifier Unit and must be ordered separately.

Size	Cable	Appearance	Cable type		Models
M8	Standard	Straight 	2 m	4-wire	**XS3F-M421-402-A**
			5 m		**XS3F-M421-405-A**
		L-shaped 	2 m		**XS3F-M422-402-A**
			5 m		**XS3F-M422-405-A**

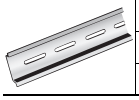
Mounting Bracket

A Mounting Bracket is not provided with the Fiber Amplifier Unit and must be ordered separately as required.

Appearance	Model	Quantity
	**E39-L143**	1

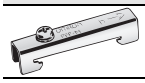
DIN Track

A Din Track is not provided with the Fiber Amplifier Unit and must be ordered separately as required.

Appearance	Type	Models	Quantity
	Shallow type, total length: 1 m	**PFP-100N**	1
	Shallow type, total length: 0.5 m	**PFP-50N**	
	Deep type, total length: 1 m	**PFP-100N2**	

End Plate

Two End Plates are provided with the Sensor Communications Unit.
End Plates are not provided with the Fiber Amplifier Unit and must be ordered separately as required.

Appearance	Model	Quantity
	**PFP-M**	1

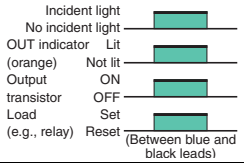
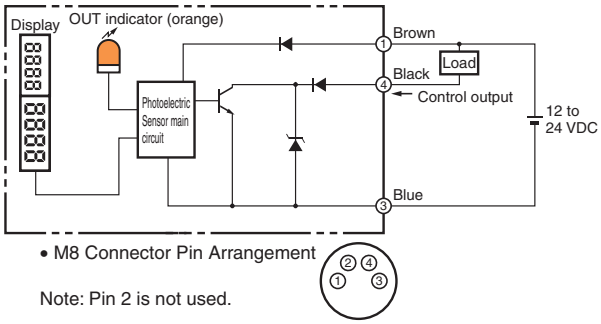
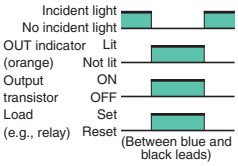
Ratings and Specifications

Item		Type	Standard			Model for Sensor Communications Unit *1
		NPN output	E3X-HD11	E3X-HD6	E3X-HD14	E3X-HD0
		PNP output	E3X-HD41	E3X-HD8	E3X-HD44	
		Connecting method	Pre-wired	Wire-saving Connector *2	M8 Connector	Connector for Sensor Communications Unit
Light source (wavelength)			Red, 4-element LED (625 nm)			
Power supply voltage			12 to 24 VDC ±10%, ripple (P-P) 10% max.			Supplied from the connector through the Sensor Communications Unit
Power consumption	Normal mode		720 mW max. (Current consumption: 30 mA max. at 24 VDC, 60 mA max. at 12 VDC)			
	Eco ON		530 mW max. (Current consumption: 22 mA max. at 24 VDC, 44 mA max. at 12 VDC)			
	Eco LO		640 mW max. (Current consumption: 26 mA max. at 24 VDC, 53 mA max. at 12 VDC)			–
Control output			Load power supply voltage: 26.4 VDC max., open-collector output Load current: Groups of 1 to 3 Amplifier Units: 100mA max., Groups of 4 to 16 Amplifier Units: 20mA max. Residual voltage: At load current of less than 10 mA: 1 V max., At load current of 10 to 100 mA: 2 V max. OFF current: 0.1 mA max.			–
Protection circuits			Power supply reverse polarity protection, output short-circuit protection and output reverse polarity protection			Power supply reverse polarity protection and output short-circuit protection
Response time	Super-high-speed mode (SHS) *3		NPN outputs: Operate or reset: 50 µs PNP outputs: Operate or reset: 55 µs			–
	High-speed mode (HS)		Operate or reset: 250 µs (default setting)			
	Standard mode (Stnd)		Operate or reset: 1 ms			
	Giga-power mode (GIGA)		Operate or reset: 16 ms			
Maximum connectable Units			16 units			with E3X-CRT: 16 units with E3X-ECT: 30 units
Mutual interference prevention			Possible for up to 10 units (optical communications sync) *3			
Auto power control (APC)			Always ON			
Other functions			Power tuning, differential detection, DPC, timer (OFF-delay, ON-delay, or one-shot), zero reset, resetting settings, and Eco mode			
Ambient illumination (Receiver side)			Incandescent lamp: 20,000 lx max., Sunlight: 30,000 lx max.			
Ambient temperature range			Operating: Groups of 1 to 2 Amplifiers: –25 to 55°C, Groups of 3 to 10 Amplifiers: –25 to 50°C, Groups of 11 to 16 Amplifiers: –25 to 45°C Storage: –30 to 70°C (with no icing or condensation)			Operating: Groups of 1 to 2 Amplifiers: 0 to 55°C, Groups of 3 to 10 Amplifiers: 0 to 50°C, Groups of 11 to 16 Amplifiers: 0 to 45°C, Groups of 17 to 30 Amplifiers: 0 to 40°C Storage: –30 to 70°C (with no icing or condensation)
Ambient humidity range			Operating and storage: 35% to 85% (with no condensation)			
Insulation resistance			20 MΩ min. (at 500 VDC)			
Dielectric strength			1,000 VAC at 50/60 Hz for 1 minute			
Vibration resistance (destruction)			10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions			10 to 150 Hz with a 0.7-mm double amplitude for 80 minutes each in X, Y, and Z directions
Shock resistance (destruction)			500 m/s^2 for 3 times each in X, Y, and Z directions			150 m/s^2 for 3 times each in X, Y, and Z directions
Degree of protection			IEC 60529 IP50 (with Protective Cover attached)			–
Weight (packed state/unit only)			Approx. 105 g/ Approx. 65 g	Approx. 60 g/ Approx. 20 g	Approx. 70 g/ Approx. 25 g	Approx. 65 g/Approx. 25 g
Materials	Case		Polycarbonate (PC)			Heat-resistant ABS (connector: PBT)
	Cover		Polycarbonate (PC)			
	Cable		PVC	–		
Accessories			Instruction Manual			

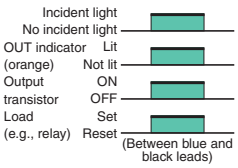
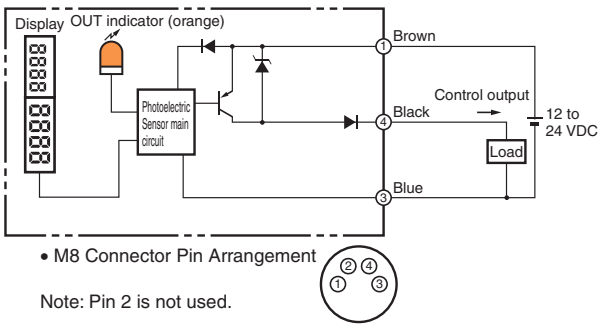
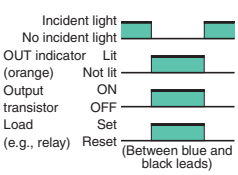
*1. The E3X-ECT EtherCAT Sensor Communications Unit and the E3X-CRT CompoNet Sensor Communications Unit can be used.
*2. Use either the E3X-CN11 (master connector, 3 conductors) or the E3X-CN12 (slave connector, 1 conductor).
*3. The communications function and mutual interference prevention function are disabled when the detection mode is set to Super-high-speed mode (SHS).
When including E3X-DA-S with activated power tuning, mutual interference prevention is possible for up to 6 units.
When including E3X-MDA with activated power tuning, mutual interference prevention is possible for up to 5 units.
E3X-DA□-S Series in this catalog have been discontinued at the end of March 2017 and end of March 2019.
E3X-MDA Series will be accepted until the end of August 2021.

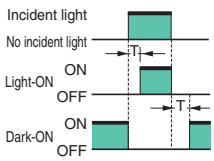
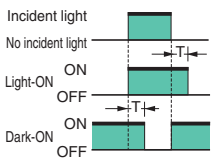
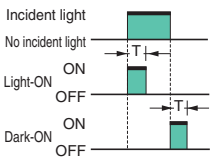
I/O Circuit Diagrams

NPN Output

Models	Operation mode	Timing chart	L/D indicators	Output circuit
E3X-HD11 E3X-HD6 E3X-HD14	Light-ON		L lit.	
	Dark-ON		D lit.	

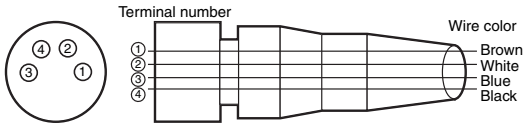
PNP Output

Models	Operation mode	Timing chart	L/D indicators	Output circuit
E3X-HD41 E3X-HD8 E3X-HD44	Light-ON		L lit.	
	Dark-ON		D lit.	

ON delay	OFF delay	One-shot
		

Note: Timing Charts for Timer Settings (T: Set Time)

Plug (Sensor I/O Connector)



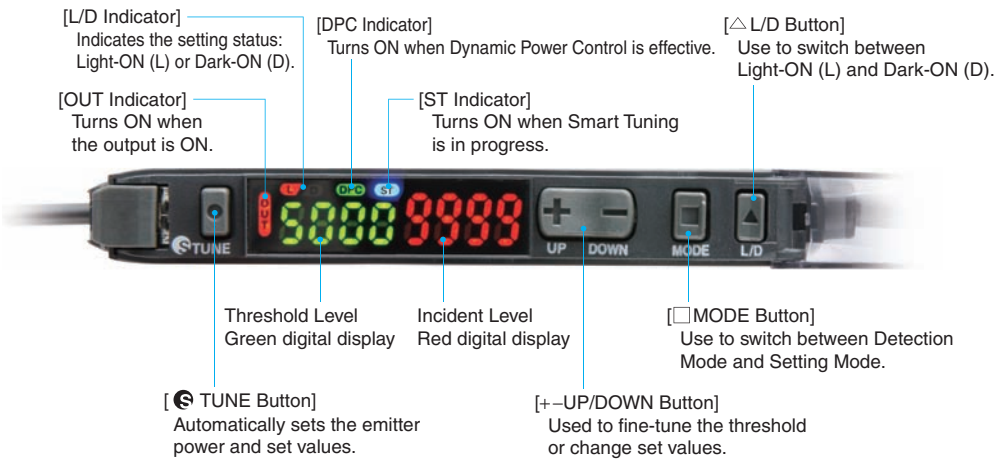
XS3F-M421-402-A
XS3F-M421-405-A

XS3F-M422-402-A
XS3F-M422-405-A

Wire color	Connection pin	Application
Brown	1	Power supply (+V)
White	2	---
Blue	3	Power supply (0 V)
Black	4	Output

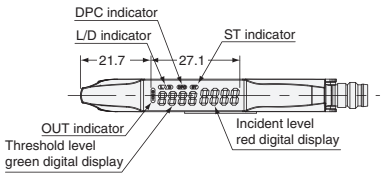
Note: Pin 2 is not used.

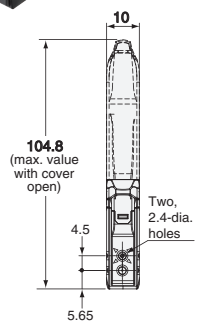
Nomenclature



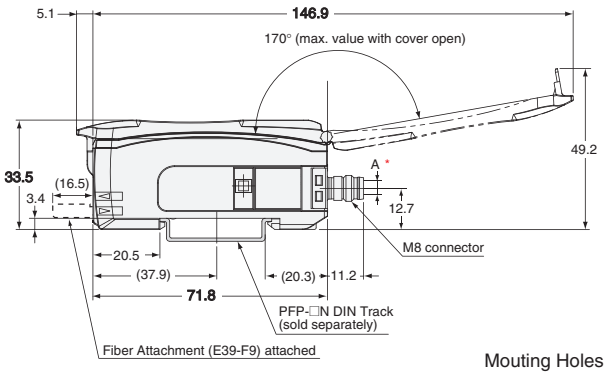
Amplifier Units with M8 Connectors

E3X-HD14
E3X-HD44



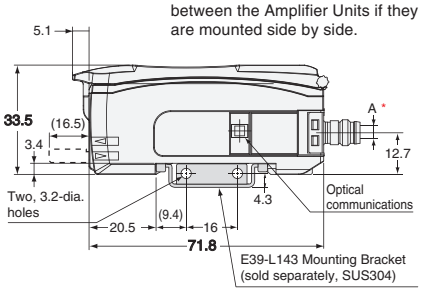


DIN track mounting

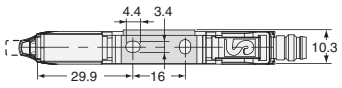


With Mounting Braket Attached

Note: When using E39-L143 Mounting Brackets, there will be small gaps between the Amplifier Units if they are mounted side by side.



Mouting Holes

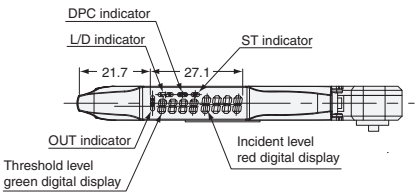


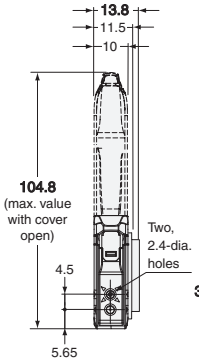
* The cable diameters are as follows:

E3X-CN11 (3 conductors)	4.0 dia.
E3X-CN12 (1 conductor)	2.6 dia.

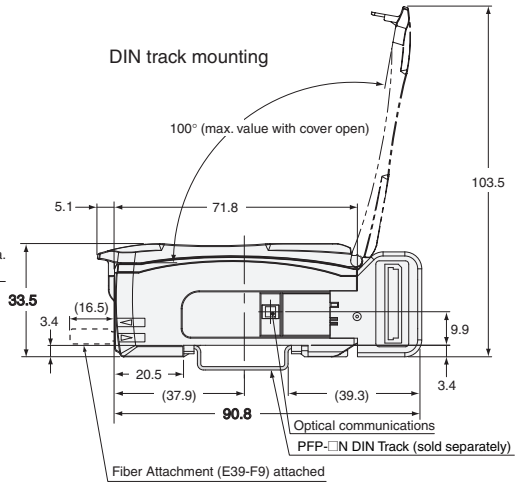
Amplifier Unit with Connector for Sensor Communications Unit

E3X-HD0





DIN track mounting



Refer to *E32 Series* for details on Fiber Units.