# 1-Line System Fiber Sensor Amplifiers **FS-T/M Series**



For standard certification and conformance list, see our website. www.keyence.com/products/certified/

# ASK KEYENCE -

1-888-KEYENCE www.keyence.com/ASKG



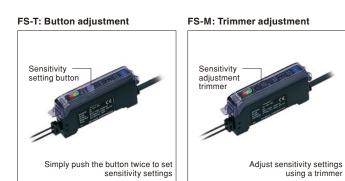
# FREE DOWNLOAD -

www.keyence.com/DLG

Free downloads for product and technical support are readily available in one convenient location

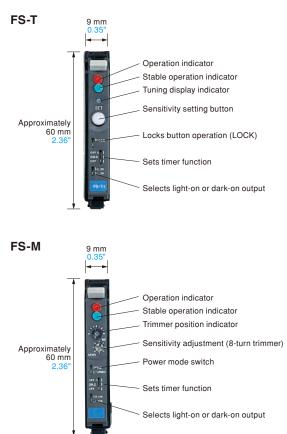
# Two types of setting adjustment

Simple fiberoptic sensor available in button or trimmer models.



# All settings except for sensitivity are set with switches

Check settings without having to refer to the instruction manual.



# Lineup

The FS-T/M Series saves on wiring between main units and expansion units. Up to 16 expansion units can be added to a single main unit.

## 1-touch calibration type FS-T Series

Appearance	Туре		Light source	Model	
Appearance			Light Source	NPN	PNP
Main units Expansion units	Main units	Standard	Red LED	FS-T1	FS-T1P
		Mark identification type	Green LED	FS-T1G	_
	Expansion units	Standard	Red LED	FS-T2	FS-T2P

# **Trimmer type FS-M Series**

Appearance	Туре		Light source	Model	
Appearance				NPN	PNP
Main units	Main units	Standard	Red LED	FS-M1	FS-M1P
		Ultra-fast response type		FS-M1H	_
	Expansion units	Standard		FS-M2	FS-M2P

Main units include mounting brackets and expansion units include end units.



Mounting bracket **OP-25431** 



»RECOMMEND FS-M1H is the fastest amplifier in the FS Series.



# New Products

Fiberoptic Sensors

Photoelectric Sensors

Proximity Sensors

### Safety Equipment

Flow/ Pressure/ Temperature

Measurement Sensors

Controls

Static Eliminators

Vision Systems

Marking Equipment

Code Readers

Handheld Mobile Computers

Microscopes

Projector/ 3D Measurement Systems



# **FS-T/M** 1-Line System Fiber Sensor Amplifiers

# Specifications

# Amplifier (FS-T/M Series)

Туре		Main unit	1-line Expansion unit	Main unit	1-line Expansion unit		
Model	NPN	FS-T1	FS-T2	FS-M1	FS-M2		
	PNP	FS-T1P	FS-T2P	FS-M1P	FS-M2P		
Appearance				i i i i i i i i i i i i i i i i i i i			
Light source		1	Rec	ILED	1		
Sensitivity adjustm	ent/Mode selection	Butt	ion	8-turn trimmer (with indicator), FINE/TURBO (switch-selectable			
Response time		250 µs		250 μs (FINE)/500 μs (TURBO)			
Operation mode		LIGHT-ON/DARK-ON (switch-selectable)					
Display indicator		Output indicator: Red LED Stable operation indicator: Green LED Calibration indicator: Orange LED		Output indicator: Red LED Stable operation indicator: Green LED			
Timer function		ON-delay: 40 ms/ OFF-delay: 40 ms/ Timer OFF (switch-selectable)					
External calibration input signal		Non-voltage input (contact, solid state)		_			
NPN	NPN	NPN open-collector 100 mA max. (40 VDC max.), Residual voltage: 1 V max. <sup>1.</sup>					
Control output PNP		PNP open-collector 100 mA max. (40 VDC max.), Residual voltage: 1 V max. 1					
	NPN	NPN open-collector 50mA max. (40 VDC max.), Residual voltage: 1 V max. <sup>1.2</sup>					
Stability output PNP		PNP open-collector 50 mA max. (40 VDC max.), Residual voltage: 1 V max. <sup>1,2</sup>					
Protection circuit	otection circuit Reversed polarit		Reversed polarity protection, over	protection, over-current protection, surge absorber			
No. of expansion ur	nits <sup>1.</sup>	Up to 16 expansion units can be		e connected (a total of 17 units)			
Mutual interference	suppression	FINE : 4, TURE		RBO/SUPER: 8			
Power supply		12 to 24 VDC (±10%), rippl		эрle (p-p): 10% max. <sup>з.</sup>			
Current consumptio	on		35 m	A max.			
Ambient illuminatio	umination Incandescent lamp: 10,000 lux max., Sunlight: 20,000 lux max		max., Sunlight: 20,000 lux max.				
Imbient temperature			-10 to +55°C (14 to 131°F), No freezing				
Relative humidity		35 to 85%, No		lo condensation			
Vibration resistance	9	1	0 to 55 Hz, double amplitude: 1.5 mm	0.06", 2 hours each in the X, Y and Z axi	S		
Shock resistance		500 m/s² in X, Y, and Z direc		ections, 3 times respectively			
Housing	ing Polycarbonate						
Weight (including 2	'-m 6.6' cable)	Approx. 75 g	Approx. 40 g	Approx. 75 g	Approx. 40 g		

1. If more than one unit is used together, the ambient temperature varies with the conditions below. Mount the units on the DIN rail with mounting brackets and check that the output current is 20 mA or less. 3 to 10 Units: -10 to +50°C (14 to 122°F). 11 to 16 Units: -10 to +45°C (14 to 113°F)

Only the FS-T1 and FS-M1 can provide stability outputs.
 Power to the FS-T2/M2 is supplied through the FS-T1/M1/V11, PS-T1, LV-21A/11A.

Eliminators Vision Systems

Static

Controls

Marking Equipment

Code Readers

Handheld Mobile Computers

Microscopes

Projector/ 3D Measurement Systems



FIBEROPTIC SENSORS

**New Products** 

Fiberoptic Sensors

Photoelectric Sensors Proximity Sensors Safety Equipment Flow/ Pressure/ Temperature Measurement Sensors

# Mark identification type

Model	FS-T1G				
Appearance					
Light source	Green LED				
Response time	250 µs				
Operation mode	LIGHT-ON/DARK-ON (switch-selectable)				
Display indicator	Output indicator: Red LED, Stable operation indicator: Green LED, Calibration indicator: Orange LED				
Timer function	ON-delay: 40 ms/ OFF-delay: 40 ms/ Timer OFF (switch-selectable)				
External calibration input signal	Non-voltage input (contact, solid state)				
Control output	NPN open-collector: 100 mA max. (40 VDC max.), Residual voltage:1 V max.				
Stability output	NPN open-collector: 50 mA max. (40 VDC max.), Residual voltage:1 V max.				
Protection circuit	Reversed polarity protection, over-current protection,surge absorber				
Power supply	12 to 24 VDC ±10%, ripple (P-P): 10% max.				
Current consumption	35 mA max.				
Ambient illumination	Incandescent lamp: 10,000 lux max., Sunlight: 20,000 lux max.				
Ambient temperature	-10 to +55°C (14 to 131°F), No freezing*				
Relative humidity	35 to 85%, No condensation				
Vibration resistance	10 to 55 Hz, double amplitude: 1.5 mm 0.06", 2 hours each in the X, Y and Z axis				
Shock resistance	$500\mbox{ m/s}^2$ in X, Y, and Z directions, 3 times respectively				
Housing	Polycarbonate				
Weight (including 2-m 6.6' cable)	Approx. 75 g				

Model	FS-T1G	Model	FS-M1H	
Appearance		Appearance	<b>.</b>	
Light source	Green LED	Light source	RED LED	
Response time	250 µs	Sensitivity adjustment/ Mode selection	8-turn trimmer (with indicator), FINE/TURBO (switch-selectable)	
Operation mode	LIGHT-ON/DARK-ON (switch-selectable)	Response time	20 μs (FINE)/ 50 μs (TURBO)	
Display indicator	Output indicator: Red LED, Stable operation indicator: Green LED, Calibration indicator: Orange LED	Operation mode	LIGHT-ON/DARK-ON (switch-selectable)	
Timer function	ON-delay: 40 ms/ OFF-delay: 40 ms/ Timer OFF (switch-selectable)	Display indicator	Output indicator: Red LED, Stable operation indicator: Green LED	
External calibration input signal	Non-voltage input (contact, solid state)	Timer function	ON-delay: 40 ms/ OFF-delay: 40 ms/ Timer OFF (switch-selectable)	
Control output	NPN open-collector: 100 mA max. (40 VDC max.), Residual voltage:1 V max.	Control output	NPN open-collector: 100 mA max. (40 VDC max.), Residual voltage:1 V max.	
Stability output	NPN open-collector: 50 mA max. (40 VDC max.), Residual voltage:1 V max.	Stability output	NPN open-collector: 50 mA max. (40 VDC max.), Residual voltage:1 V max.	
Protection circuit	Reversed polarity protection, over-current protection,surge absorber	Protection circuit	Reversed polarity protection, over-current protection, surge absorber	
Power supply	12 to 24 VDC ±10%, ripple (P-P): 10% max.	Power supply	12 to 24 VDC ±10%, ripple (P-P): 10% max.	
Current consumption	35 mA max.	Current consumption	35 mA max.	
Ambient illumination	Incandescent lamp: 10,000 lux max., Sunlight: 20,000 lux max.	Ambient illumination	Incandescent lamp: 10,000 lux max., Sunlight: 20,000 lux max.	
Ambient temperature	-10 to +55°C (14 to 131°F), No freezing*	Ambient temperature	-10 to +55°C (14 to 131°F), No freezing*	
Relative humidity	35 to 85%, No condensation	Relative humidity	35 to 85%, No condensation	
Vibration resistance	ion resistance 10 to 55 Hz, double amplitude: 1.5 mm 0.06*, 2 hours each in the X, Y and Z axis		10 to 55 Hz, double amplitude: 1.5 mm 0.06", 2 hours each in the X, Y and Z axis	
Shock resistance	500 m/s <sup>2</sup> in X, Y, and Z directions, 3 times respectively	Shock resistance	500 m/s² in X, Y, and Z directions, 3 times respective	
Housing	Polycarbonate	Housing	Polycarbonate	
Weight (including 2-m 6.6' cable)	Approx. 75 g	Weight (including 2-m 6.6' cable)	Approx. 75 g	

FIBEROPTIC SENSORS

New Products

Fiberoptic Sensors

Photoelectric Sensors

Proximity Sensors

Safety Equipment

Flow/ Pressure/ Temperature

Measurement Sensors

Controls

Static Eliminators

Vision Systems

Marking Equipment

**Code Readers** 

Handheld Mobile Computers

Microscopes

Projector/ 3D Measurement Systems



# Ultra-fast response type

# Input/Output circuit

## FS-T1/M1/T1G/M1H

the 0 V terminal of the power supply.

Input circuit

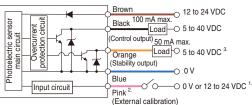
\*

1. The FS-M1P does not have a pink cable (for external calibration).

2. When the stability output is not used, cut the orange cable at the base.

FS-T1P/M1P

Photoelectric sen main circuit Overcurre protectic circuit



1. When the external calibration input is not used, cut the pink cable at the root, or connect this

cable to the positive terminal of the power supply.
The FS-M1/M1H does not have a pink cable (for external calibration).
When the stability output is not used, cut the orange cable at the base, or connect this cable to

Brown

Black

Blue

100 mA max

(Control output) (Control output) 50 mA max.<sup>2</sup> Orange (Stability

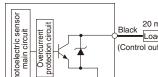
Pink (External calibration)<sup>1</sup>

(Stability output)

O 12 to 24 VDC

0 V or 12 to 24 VDC

0 0 V



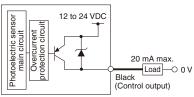
OV Th

20 mA max. Load-(Control output)

Power is supplied through the main unit.

### FS-T2P/M2P

FS-T2/M2



Power is supplied through the main unit.

**New Products** 

FIBEROPTIC SENSORS

Fiberoptic Sensors

Photoelectric Sensors

Proximity Sensors

Safety

Equipment Flow/ Pressure/

Temperature Measurement

Sensors

Controls

Static Eliminators

Vision Systems

Marking Equipment

**Code Readers** 

Handheld Mobile Computers

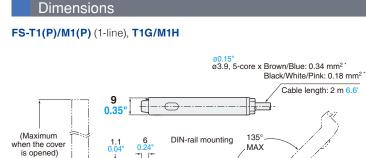
Microscopes

Projector/ 3D Measurement Systems



# 1-Line System Fiber Sensor Amplifiers **FS-T/M**





28.5

<

8.4

35.4

53.5

2.11

\* FS-M1: ø3.9 ø0.15", 4-core x

1-

8888

35.4

53.5

2.11

11

43

min

(33) 1.12

(1.30")

Accessory: Mounting bracket x 1

FS-T2(P)/M2(P) (1-line expansion unit)

9 0.35

> 1.1 0.04

> > 28.5

8.4

0.33

(33) **1.12'** (1.30")

78 3.07

(Maximum

when the cover is opened)

78 3.07

4 0.16

6.7 0.26

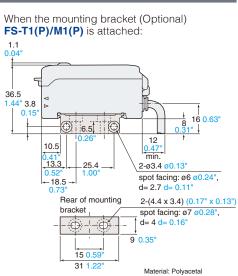
14

4 0.16

6.7 0.26

ιL

Ē



FU FS NU

# FIBEROPTIC SENSORS

New Products



Photoelectric Sensors

Proximity Sensors

Safety Equipment

Flow/ Pressure/ Temperature

Measurement Sensors

Controls

Static Eliminators

Vision Systems

Marking Equipment

Code Readers

Handheld Mobile Computers

Microscopes

Projector/ 3D Measurement Systems



(12.5) (0.49")

Accessory: End unit

x 2

Caution label x 1

(12.5) (0.49")

Brown/Blue: 0.34 mm<sup>2</sup>

Black/Orange: 0.18 mm<sup>2</sup>

00.10" 2.6, 1-core x 0.34 mm<sup>2</sup>

Cable length: 2 m 6.6

12

min

CAD DATA DOWNLOAD: www.keyence.com/CADG