CE GROUP
ELECTRICAL & MECHANICAL SUPPLIES

Autonics
Sensors & Controllers

Fiber Optic Sensors : BF5 Series

Single/Dual Digital Display Fiber Optic Amplifiers

The BF5 series fiber optic amplifiers are available in single and dual display models. The units feature 5 different response speed settings, for flexible and reliable detection of fast moving targets or small objects. With integrated mutual interference prevention, reliable detection is possible with multiple units (up to 8 units) with connection using side connectors. Other features include saturation prevention function, inverted display, and simple sensitivity adjustment settings. Red, green, and blue LED light source models are available for diverse applications

Main features:

* Available in dual and single display models
* Dual digital display for displaying current value and set value (BF5□-D)
* 5 response speeds: - Ultra-fast mode (50 μs), fast mode (150 μs), standard mode (500 μs), long-distance mode (4 ms), ultra-long-distance mode (10 ms)
* Display range: 0-4000 (standard mode), 0-9999 (long-distance mode)
* Saturation prevention function: prevent errors from saturation of received light
* Inverted display: invert displays depending on installation for easier reading
* Long term stability without diode deterioration and minimal influence from temperature changes
* Simple sensitivity adjustment settings
* Multiple sensitivity setting modes: - Auto-tuning, one-point teaching (maximum sensitivity), two-point teaching, position teaching
* Mutual interference prevention allows adjacent installation (up to 8 units) with side connectors
* Auto channel setting function for easy configuration of multiple units
* Various LED light sources (red, green, blue) available for diverse applications
* Slim and compact design (W 10 x H 30 x L 70 mm)

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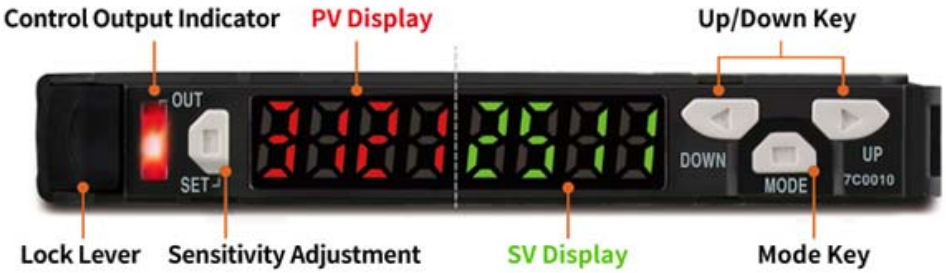
BF5 Features

1 Dual Digital Display

With the dual digital display screen, users can easily identify the present value (PV) and set value (SV)



2 High-Speed Response Rate of 50 μs in Ultra-Fast Mode

The sensors feature 5 different response speeds: Ultra-fast mode (50 μs), fast mode (150 μs), standard mode (500 μs), long-distance mode (4 ms), ultra-long-distance mode (10 ms)

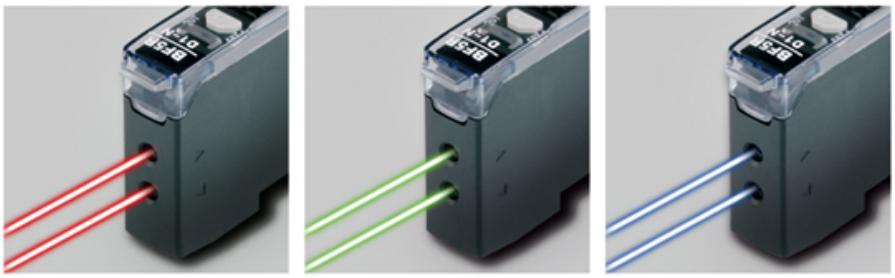
3 Saturation Prevention Function

When the detecting transparent objects or if the target moves out of position, the received light intensity may increase.
The saturation prevention function prevents errors from light saturation by adjusting to the difference in the received light.

- Target Present
- Target Absent

4 Red, Green, Blue LED Light Sources Available

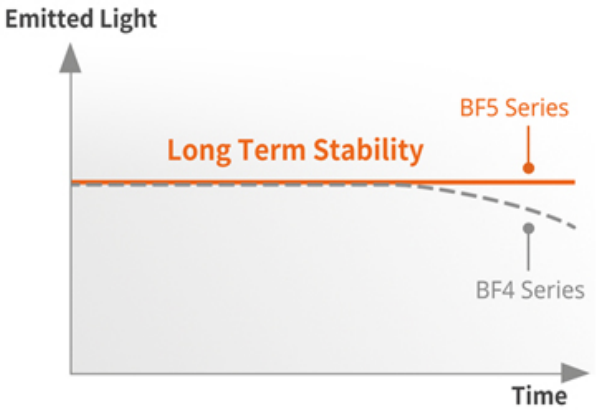
Depending on the color of the target object or ambient lighting conditions, users can choose between red, green, and blue LED light source models for precise and accurate detection.



Red LED Light Source (BF5R) | Green LED Light Source (BF5G) | Blue LED Light Source (BF5B)

5 Durable and Reliable

Long term stability without diode deterioration and minimal influence from temperature changes

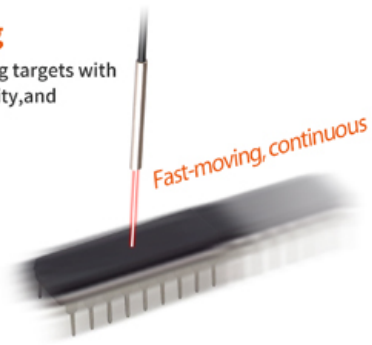


6 Various Sensitivity Setting Modes

Depending on the environment, users can choose between auto-tuning, one-point teaching (maximum sensitivity), two-point teaching, and position teaching modes.

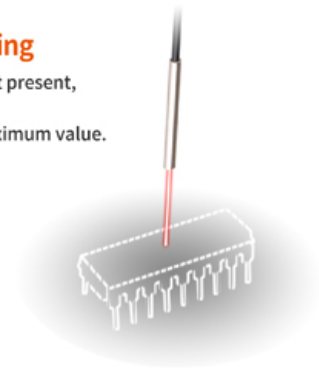
• Auto-Tuning

Used for fast moving targets with uneven light intensity,and without stopping



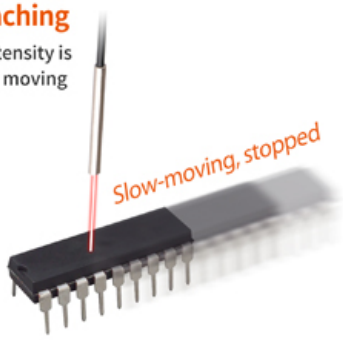
• One-Point Teaching

Used when the target is not present, or set to minimum.
The sensitivity is set to maximum value.



• Two-Point Teaching

Used when the light intensity is even, and the target is moving slowly or at a stop

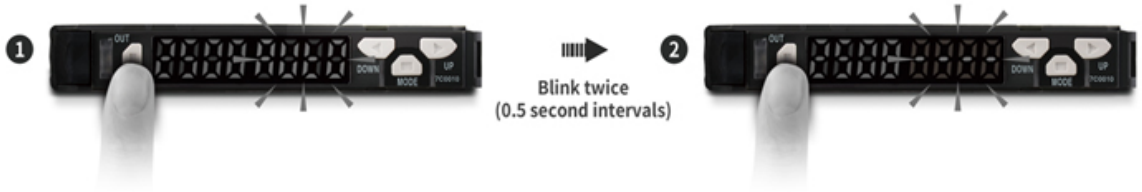


• Position Teaching

Used for detecting tiny holes or moving objects with curves. The maximum received light intensity is set to 90%

7 Simple Sensitivity Adjustment

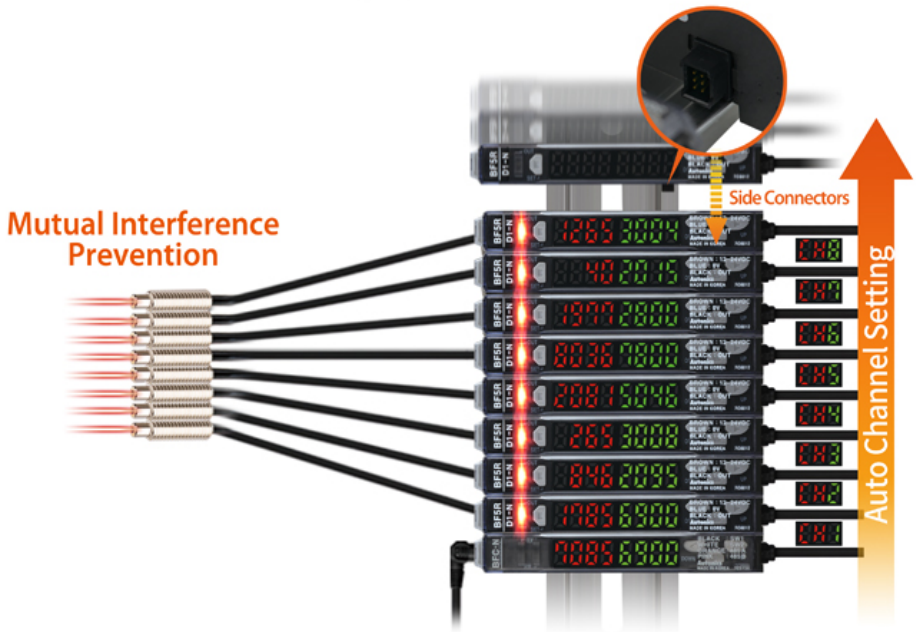
- Previous sensitivity adjustment method



- New sensitivity adjustment method

8 Mutual Interference Prevention and Auto Channel Setting

Mutual interference prevention allows adjacent installation (up to 8 units) using side connectors. When power is supplied, the connected units are automatically assigned to different channels.



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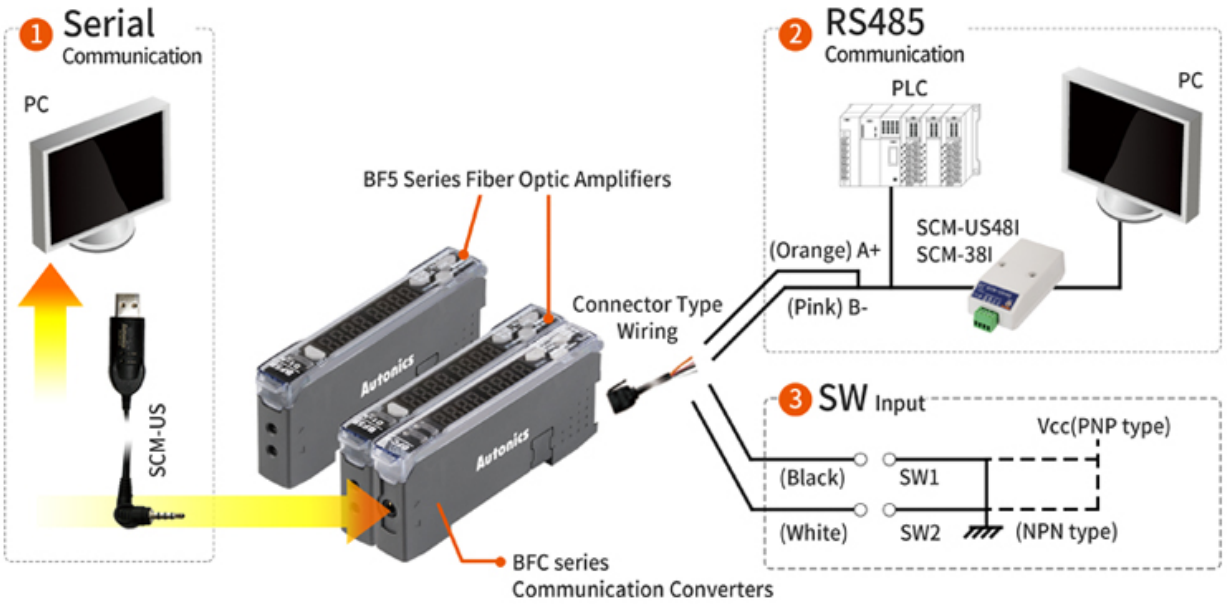
9 Communication with PCs, PLCs with BFC Communication Converters

The BFC series communication converters can be connected to the BF5 series amplifiers with the side connectors. The communication converters allow users to remotely monitor and configure parameters from external devices such as PCs or PLCs.



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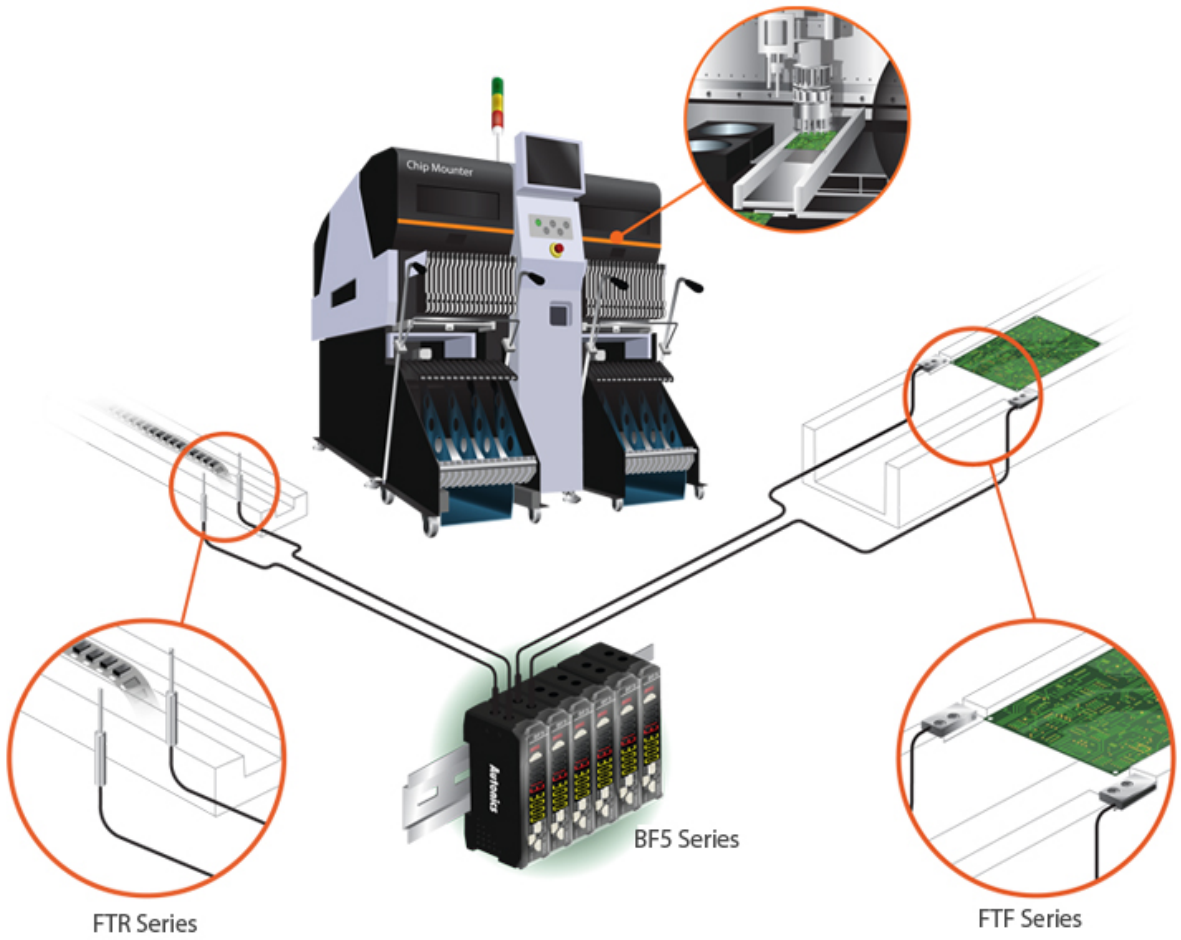
10 Applications

Presence and position detection of PCBs on chip mounting machinery



BF	5	R	-	D	1	-	N

N	NPN open collector output
P	PNP open collector output
1	Standard type
D	Dual display type
S	Single display type
R	Red LED
G	Green LED
B	Blue LED
5	Series
BF	Fiber Sensor

Display type		Dual Display type			Single Display type
Model	NPN open collector output	**BF5R-D1-N**	**BF5G-D1-N**	**BF5B-D1-N**	**BF5R-S1-N**
	PNP open collector output	**BF5R-D1-P**	**BF5G-D1-P**	**BF5B-D1-P**	**BF5R-S1-P**
Light source		Red LED (660nm)	Green LED (530nm)	Blue LED (470nm)	Red LED (660nm)
Power supply		12-24VDC⎓±10%			
Current consumption		Max. 50mA			
Operation mode		Light ON / Dark ON Selectable			
Control output		NPN or PNP open collector ●Load voltage: max. 24VDC⎓ ●Load current: max. 100mA ●Residual voltage - NPN: max. 1V, PNP: max. 3V			
Protection circuit		Reverse polarity protection, overcurrent protection, surge absorption			
Response time		Ultra Fast: 50μs, ultra long: 10ms (only for dual display type), fast: 150μs, STD: 500μs, long: 4ms			
Display method		●Incident light level: Red, 4-digit, 7-segment ●SV: Green, 4-digit, 7-segment ●Main output indicator: Red LED			●Incident light level / SV: Red, 4-digit, 7-segment ●Main output indicator: Red LED
Display function		Incident light level / SV display [4,000/10,000 resolution], percentage display, High/Low peak value display, Normal / Reversed display (only for dual display type)			
Sensitivity setting		Manual sensitivity setting, teaching sensitivity setting (auto tuning, 1 point, 2 point teaching, positioning teaching)			Manual sensitivity setting, teaching sensitivity setting (auto tuning)
Mutual interference prevention		Max. 8 unit sets (automatically set regardless of response time)			
Initializing		Initializing as factory mode			—
Energy saving		Normal / Energy saving 1 / Energy saving 2			—
Timer		OFF, OFF Delay, ON Delay, One-shot			OFF, 10ms OFF Delay timer, 40ms OFF Delay timer

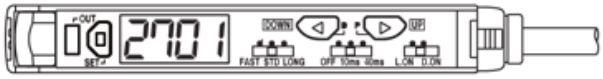
Display type		Dual Display type			Single Display type
Model	NPN open collector output	**BF5R-D1-N**	**BF5G-D1-N**	**BF5B-D1-N**	**BF5R-S1-N**
	PNP open collector output	**BF5R-D1-P**	**BF5G-D1-P**	**BF5B-D1-P**	**BF5R-S1-P**
Insulation resistance		Over 20MΩ (at 500VDC megger)			
Dielectric strength		1,000VAC 50/60Hz for 1 min			
Vibration		1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours			
Shock		500m/s^2 (approx. 50G) in each X, Y, Z direction for 3 times			
Environment	Ambient illumination	Incandescent lamp: max. 3000lx sunlight: max. 11000lx (received illumination)			
	Ambient temperature	-10 to 50°C, storage: -20 to 70°C			
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH			
Protection structure		IP40 (IEC standards)			
Material		Case: polybutylene terephthalate, cover: polycarbonate			
Fiber cable Tightening torque		Min. 2kgf			
Accessory		Connector type wire (Ø4mm, 3-wire, 2m) (AWG22, core diameter: 0.08mm, number of cores: 60, insulator out diameter: Ø1.25mm), Side connector			
Approval		CE			
Weight※1		Approx. 138g (approx. 20g)			

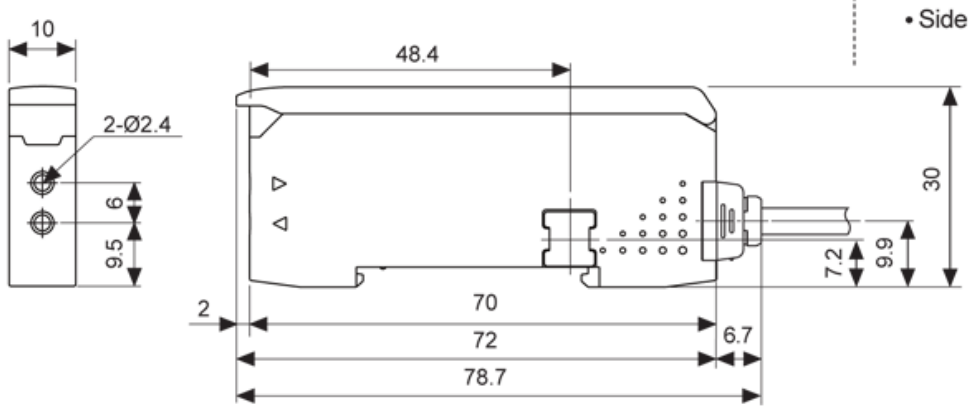
※1: The weight includes packaging. The weight in parenthesis is for unit only.
※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

(unit: mm)

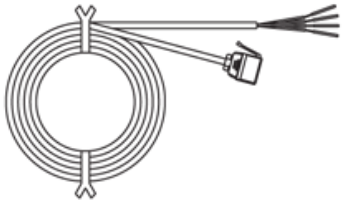
- **BF5□-D1-□**

- **BF5R-S1-□**

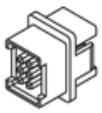




- **Accessories**
  - Connector type wire (length: 2m)



  - Side connector



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