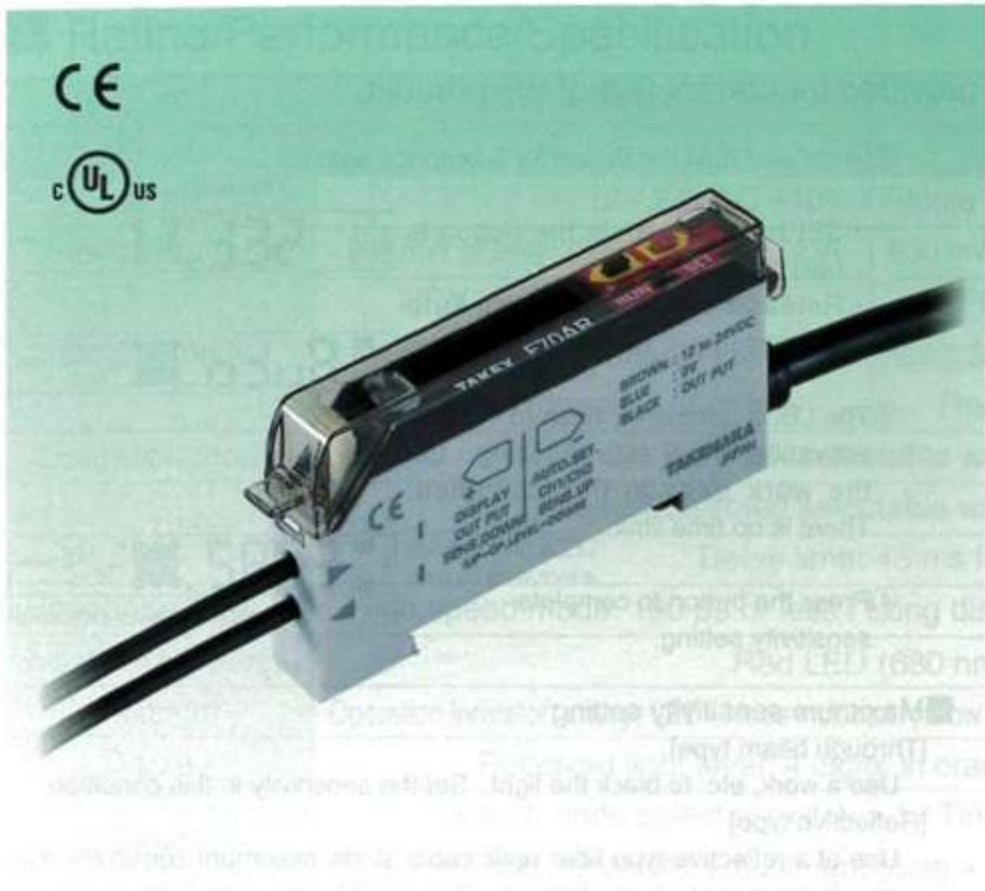


F70A Series

Digital display
Fiber optic sensors



- Digital indication of sensing information
- Simple operation for setting functions
- Two-way monitoring is available. Level and gap indication alternates with every one push of the button.
- Readily visible backlight LCD.
- Various convenient functions provided
 - Full auto/auto teaching
 - Mutual Interference prevention
 - Manual sensitivity setting
 - Off delay timer

Type

- Amplifier unit (main unit)

Type	Model		Light source	Output mode	Connection
	NPN output	PNP output			
Digital display general purpose	F70AR	F70ARPN	Red LED	Open collector output	Cable type
	F70AG	F70AGPN	Green LED		
	F70AB	F70ABPN	Blue LED		
	F70AW	F70AWPN	White LED		
	F70AR-J	F70ARPN-J	Red LED		M8 connector
	F70AG-J	F70AGPN-J	Green LED		
	F70AB-J	F70ABPN-J	Blue LED		
	F70AW-J	F70AWPN-J	White LED		

- Fiber optic cable
For types of fiber optic cable, see page 67 and after.

Optional parts

Type	Model	Description
Cable with M8 connector	FBC-4R2S	Straight type M8 connector, 2m
	FBC-4R2L	Angle type M8 connector, 2m
End unit	FA7EU	DIN rail mounting stopper
Mounting bracket (accessory)	AC-BF2	Amplifier unit mounting bracket

Simple operation

Simple operation featured

Received light level and gap indications alternate when the black button is pressed.

Press the red button twice for auto teaching and hold down for 3 seconds for full auto teaching



Self-diagnosis stability indication

Easily viewable color panel

2 types of received light level indication

Press and hold the black button for 3 seconds for switching between operation mode and channel selection mode for Anti Mutual Interference.

Level indication mode



The level of received light is indicated in 4-digit number.
Min. = 0 / Max. = 1023

Position on the electronic volume: 8

The sensitivity position on the electronic volume and the current received light level are displayed.

Gap indication mode



The example above shows that the current receiving light level is -123 with reference to the threshold.

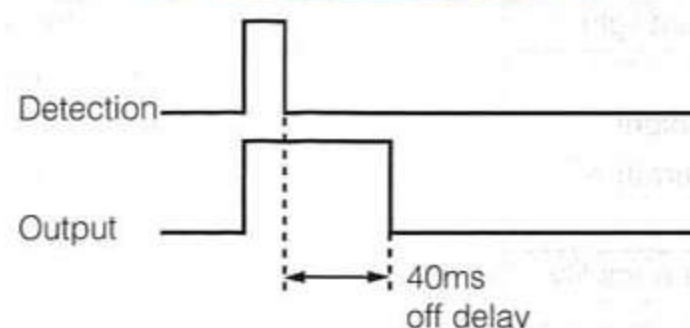
Indicates the received light intensity with [+] or [-] sign.

The level of received light is indicated in positive or negative value with reference to the threshold.

Enhanced teaching features (sensitivity setting)

- **Full auto teaching**
Simply pressing the button allows easy teaching; even for an object moving at a high speed.
- **Auto teaching**
2-point teaching "with" and "without" the work allows the detection of slight level difference such as the thickness of a piece of work and the presence of a film.
- **Position teaching**
This feature is ideal for high accuracy positioning that requires accurate determination of a detecting point.
- **Maximum sensitivity setting**
For applications requiring maximum sensitivity setting such as the detection of work with a through beam type fiber optic cable, the extra powerful light allows for use in an adverse environment.
- **Manual setting**
Arbitrary manual increase and decrease of a "set point" allows level setting while checking the operation.

Secure output for any type of device with the off delay timer



A small object moving at a high speed can be securely detected.
The off delay output enables matching a range of input configurations of connected devices.

Rating/Performance/Specification

Model		NPN	F70AR	F70AG	F70AB	F70AW	F70AR-J	F70AG-J	F70AB-J	F70AW-J
		PNP	F70ARPN	F70AGPN	F70ABPN	F70AWPN	F70ARPN-J	F70AGPN-J	F70ABPN-J	F70AWPN-J
Power supply			12 - 24VDC $\pm$ 10% / Ripple 10% or less							
Current consumption	NPN output		39 mA or less							
	PNP output		50 mA or less							
Output mode	Control output (*)	NPN output	Open collector output / Rating: Sink current 100 mA (30 VDC) or less / Residual voltage: 1 V or less							
		PNP output	Open collector output / Rating: Source current 100 mA (30 VDC) or less / Residual voltage: 2 V or less							
	Stability output (*)	NPN output	_____							
		PNP output	_____							
Operation mode			Light ON/Dark ON selectable							
Timer			Off delay/disabled selectable							
			Delay time: 40 ms fixed							
Response time			Light emission frequency channel 1: 600 μ s or less Light emission frequency channel 2: 700 μ s or less							
Light source (wavelength)			Red LED (680nm)	Green LED (525nm)	Blue LED (470nm)	White LED	Red LED (680nm)	Green LED (525nm)	Blue LED (470nm)	White LED
Indicator			Operation indicator: orange LED / Stability (STB) indicator: green LED							
Display			LCD display with backlight							
Switch			2 set buttons / Mode selector switch: RUN/SET							
Sensitivity setting			Full auto teaching / Auto teaching							
Sensitivity setting input			Set button input							
Sensitivity adjustment function			Provided (manual sensitivity adjustment)							
Functions			• Mutual Interference prevention feature • Short circuit protection feature							
Material			Polycarbonate							
Connection			Attached cable (outer diameter: 4.8mm) 0.2mm ² , 3 cores, 2m				M8 connector			
Weight			Cable type: approx. 80 g (including cables and mounting bracket); M8 connector type: approx.. 25g							
Accessory			Mounting bracket / Operation manual							

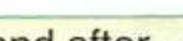
(*) Detection can start when more than 0.5 seconds has passed after power up. If the load and this sensor use different power sources, be sure to turn on the sensor first.

Environmental Specification

Ambient light	Incandescent lamp: 10,000 lx / Sunlight: 20,000 lx
Ambient temperature	1-3 adjacent units in operation: -25 - +55 °C
	4-10 adjacent units in operation: -25 - +50 °C
	11-16 adjacent units in operation: -25 - +45 °C
	Storage: -40 - +70 °C (non-freezing)
Ambient humidity	35 - 85%RH (non-condensing)
Protective structure	IP40
Vibration	10 - 55 Hz / 1.5 mm double amplitude / 2 hours each in 3 direction
Shock	500 m/s ² / 3 times each in 3 directions
Dielectric withstanding	1000 VAC for 1 minute
Insulation resistance	500 DVC, 20M Ω or more

Sensitivit 

■ Dimensions (in mm)

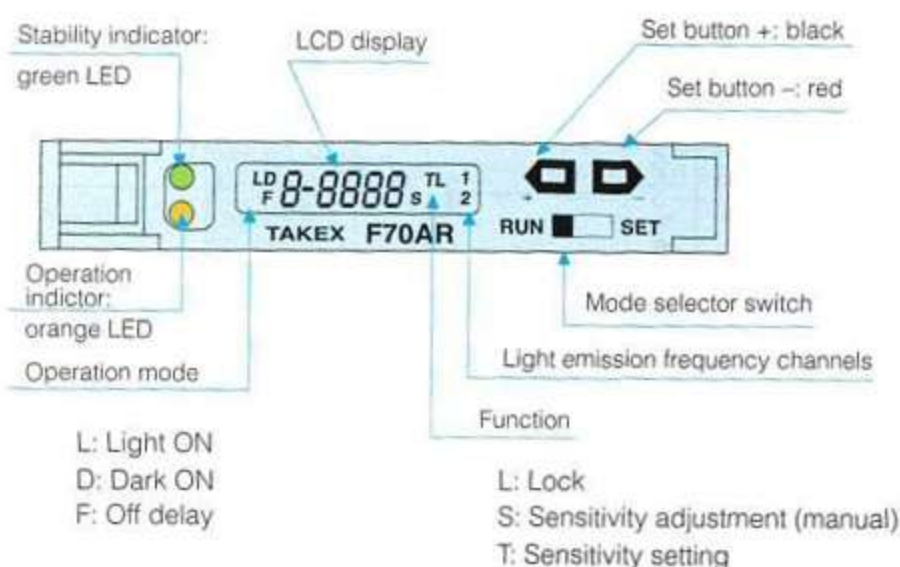


F70A

For Correct Use

Be sure to follow the instructions in the operation manual provided for correct use of the product.

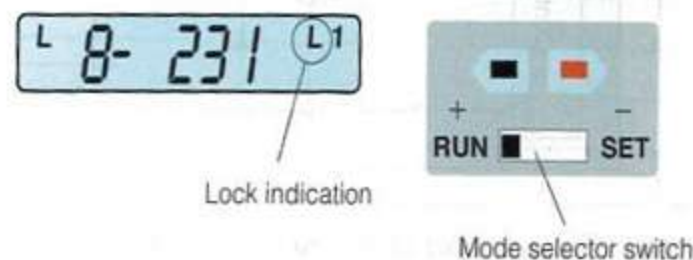
Part names



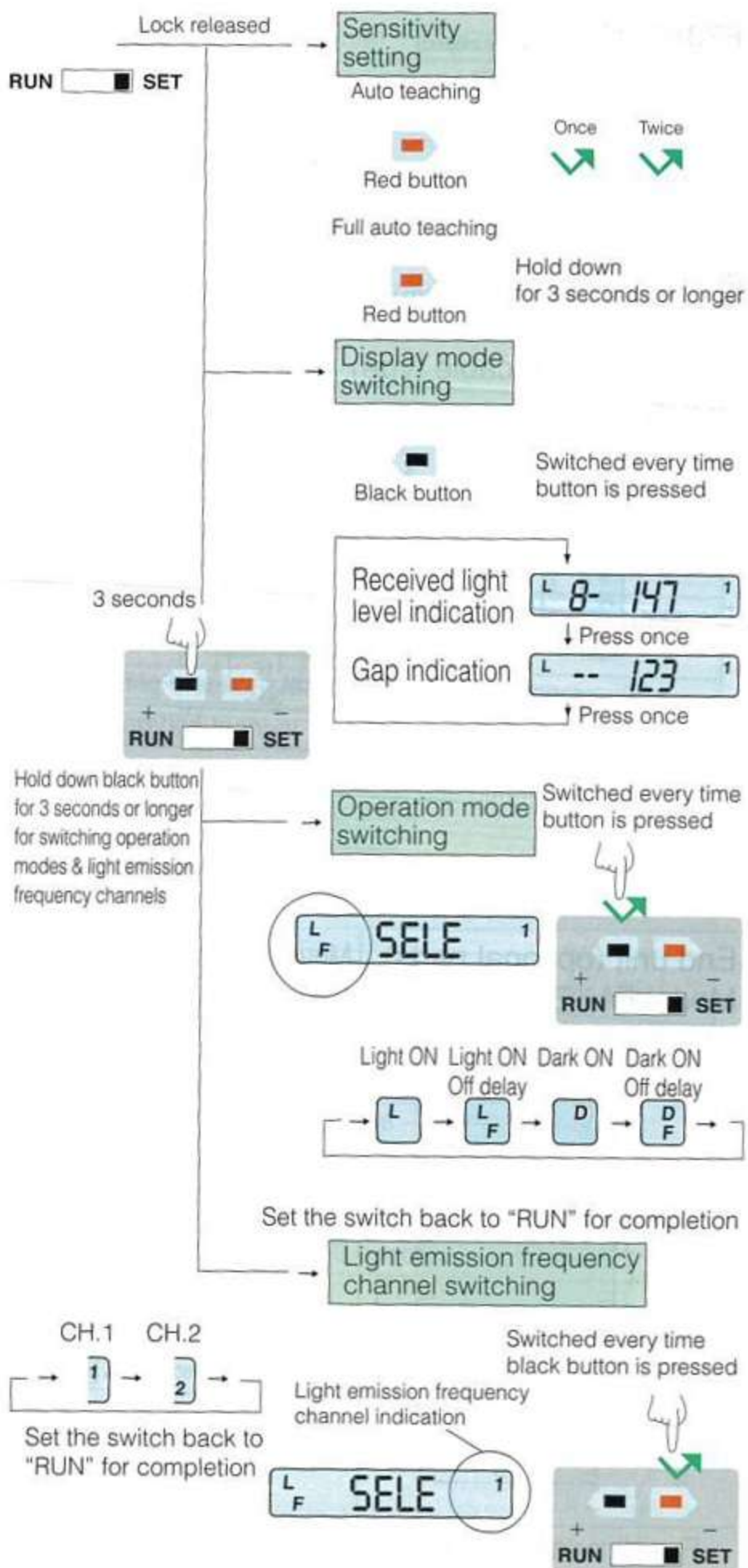
Operation

Mode selector switch

This switch should be set to RUN for normal object detection, which enables the lock mode and disables all operations on the sensor. Setting the mode selector switch to SET releases the lock, which allows operations on the sensor.



Mode selector switch Function and operation button Operation



For Correct Use

Be sure to follow the instructions in the operation manual provided for correct use of the product.

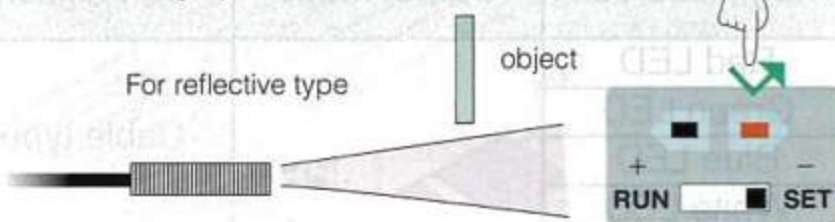
Sensitivity setting (teaching)

Set the operation mode selector switch from RUN to SET.
The lock is released and the sensor enters the sensitivity setting ready state.



Sensitivity setting using stationary object — auto teaching

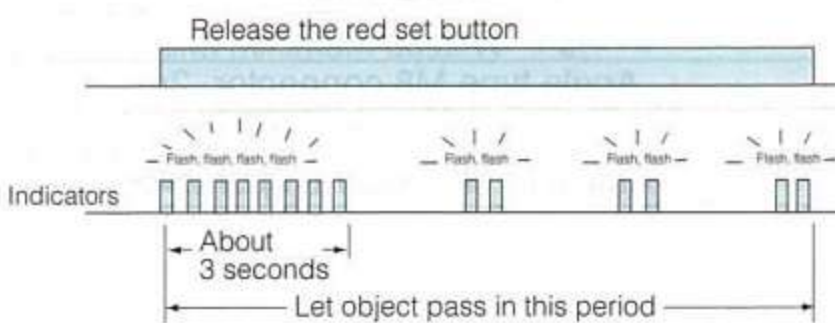
1. With no object placed, press the red set button and release it. The indicator flashes, showing that the sensor is ready for the next setting input.



2. Place the object in a given position and press the red set button. The indicator stops flashing, showing that sensitivity setting is complete.

Sensitivity setting using moving object — full auto teaching

1. Press and hold down the red set button. The orange and green indicators start flashing alternately and the flashing becomes slower after about 3 seconds.
2. Let the object pass while holding down the red set button.
3. When the passing of the object and the slow flashing of the indicators have been confirmed, release the set button.



Interference between sensors prevents correct sensitivity setting. For correct sensitivity setting, make sure that there is no interference of light by blocking the light from either of the sensors or removing the fiber optic cable from either of the amplifiers.

Manual adjustment of activation level

Sensor operation can be monitored while adjusting the activation level, which allows setting of the optimum operation level.

RUN SET After setting the switch from RUN to SET (1), set it back to RUN (2).

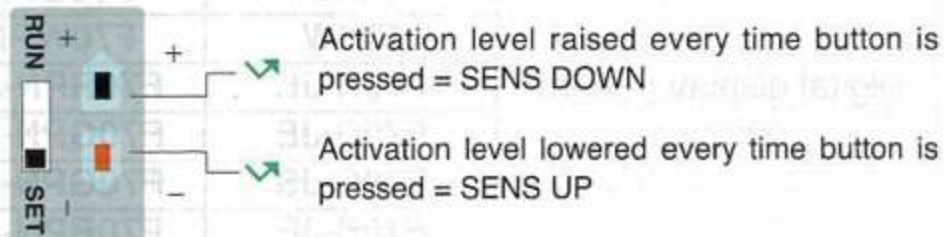
RUN SET The lock is released and the sensor enters the sensitivity adjustment mode.

For received light indication mode



Indicates that the activation level is "23."

"S" flashes to indicate that the sensitivity can be adjusted.



For gap indication mode



Before adjustment, activation level of "0" is shown.



The number is increased (decreased) every time the black (red) set button is pressed.



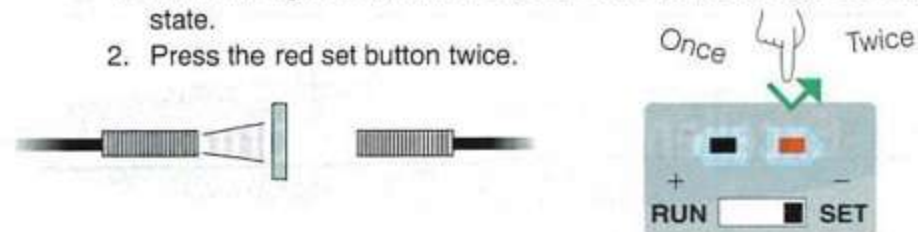
Sensitivity adjustment completed

The mode automatically switches back to the lock mode about 10 seconds after the sensitivity adjustment has been completed.

Maximum sensitivity setting: Press the red set button twice with the light blocked.

For through beam type

1. Block the light beam with an object, etc. to make the light blocking state.
2. Press the red set button twice.



For reflective type

Use of a reflective type fiber optic cable at the maximum sensitivity may cause inadequate light blocking. Be sure to use an object for sensitivity setting.

Object positioning setting

1. Place the object at the desired position.
2. With the object kept in place, press the red set button twice.

