Panasonic
INDUSTRY

NEW Amplifier Built-in

Compact Laser Distance Sensor

CX-F100 SERIES

CE

Stable Long-Range Sensing Capability Realized in a Compact Design

2025.7

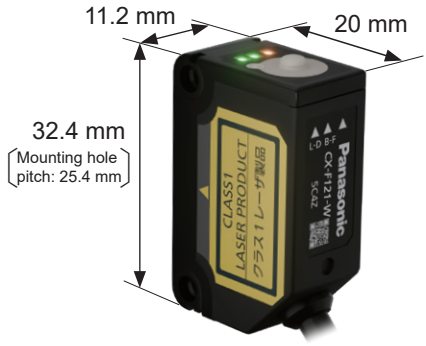
Compact Size and Stable Long-Range Sensing

Class 1 laser

TOF (Time of Flight) sensing system employed

The TOF system combined with miniaturization technology has realized stable sensing without being affected by materials or surface conditions of target workpieces in a small unit body equivalent to a general-purpose photoelectric sensor in size.

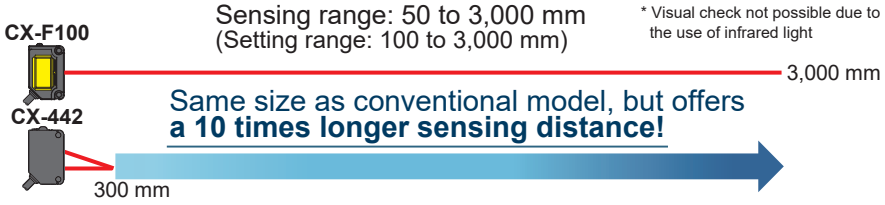
No larger than a general-purpose photoelectric sensor! Reflective type sensors with a sensing range of 50 to 3,000 mm.



(Actual size)

There are cases where long distance sensing is required but there is no space for sensor installation. The **CX-F100** series answers that need!
Our long-cultivated sensor miniaturization technology has enabled a long sensing distance of 50 to 3,000 mm with the same size as a general-purpose photoelectric sensor.
Thanks to the compact dimensions, the **CX-F100** series can be installed in a small space where a conventional TOF sensor cannot be mounted, thereby contributing to improvement of productivity.

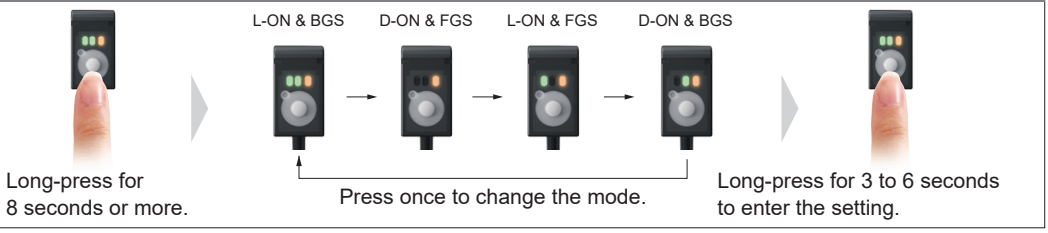
■Comparison with our conventional model (Adjustable range reflective type sensor)



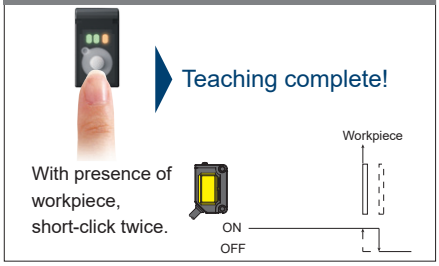
Only one button to operate! Ultimate simplicity of use.

There is no need for the worker to depend on sensory perception for adjuster operation or to operate multiple buttons in a specified pattern. The simple design enables all settings with the use of one button. This eliminates variations in teaching by different workers.

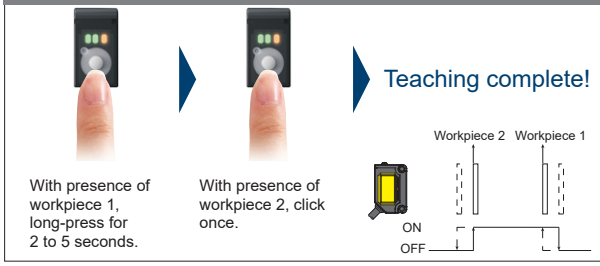
Sensing mode setting



1-point teaching



2-point teaching (window comparator mode)

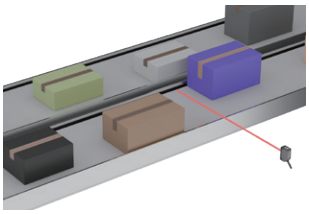


Stable sensing even if there is a moving machine or conveyor in the background!

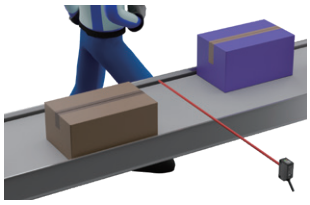
The **CX-F100** series is equipped with BGS (Background Suppression) and FGS (Foreground Suppression) functions, so the sensors offer excellent sensing stability even if people walk behind the workpiece or the conveyor or other moving machine is in the background.

BGS function Recommended when there is no background

Settings are made with reference to target workpieces.
This function does no detect objects located farther than the set distance. This prevents erroneous operation caused by a change in the background color behind the conveyor or by a person walking behind the conveyor.

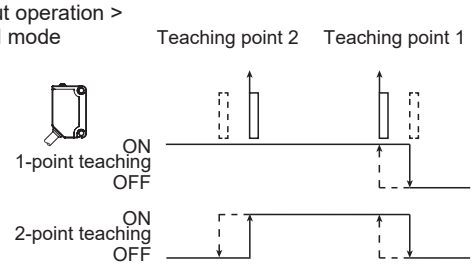


When the sensor may detect workpieces on another line



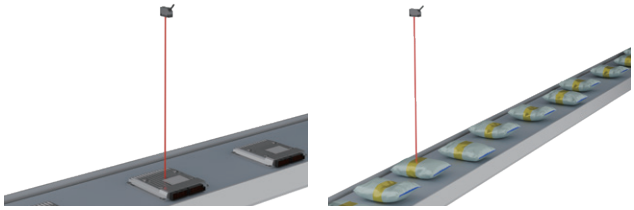
When people or objects may pass through behind the conveyor

< Output operation >
In L-ON mode



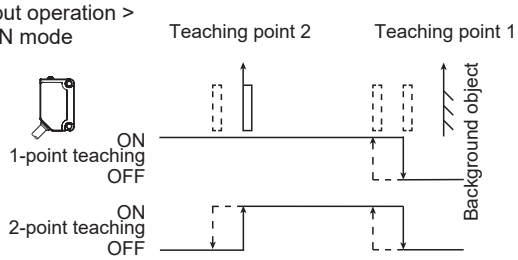
FGS function Recommended when there are background objects

Settings are made with reference to the background objects that you do not want to detect.
This function disables sensing of background objects and detects only workpieces.
Since this function does not recognize background objects, it is suitable for sensing workpieces placed directly on the conveyor.



When workpieces are placed directly on the conveyor

< Output operation >
In L-ON mode



Reduced model selection man-hours!

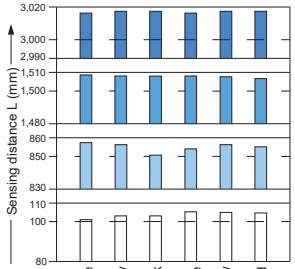
A total of 16 patterns are covered by the combination of setting and wiring.
Even if there are multiple detection conditions, the same model units can be used. This contributes to reduction of model selection man-hours.

BGS or FGS × **L-ON or D-ON** × **1-point teaching or 2-point teaching** × **NPN or PNP**

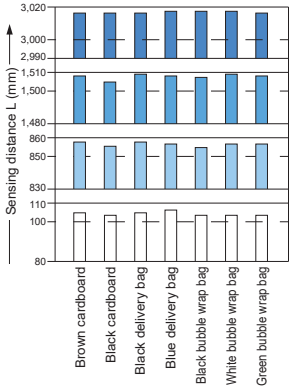
Same model units cover
16 patterns.

Stable sensing unaffected by color or material

Correlation between color (200 x 200 mm) and sensing distance

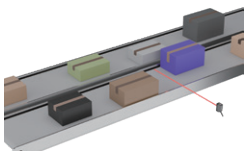


Correlation between material (200 x 200 mm) and sensing distance

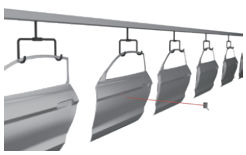


Applications

Detection of packages transported on conveyor

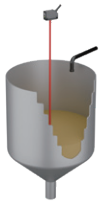


Detection of automobile doors



Detection of packages discharged from logistics warehouse

Detection of remaining amount in hopper



Detection of cardboard box transported by robot arm

SPECIFICATIONS

Item \ Type	Cable type	M8 connection type (Note 5)
Model No.	**CX-F121-W**	**CX-F121-Z-W**
Applicable regulations	CE Marking (EMC Directive, RoHS Directive)	
Setting range (Note 1)	100 to 3,000 mm	
Sensing range (Note 1)	50 to 3,000 mm	
Hysteresis (Note 1, 2)	Within 15% of the sensing distance (Sensing distance less than 900 mm) Within 8% of the sensing distance (Sensing distance 900 mm or more)	
Black / white detection error	Within 5% of setting distance	
Beam diameter (Typical value)	Approx. ø32 mm (Distance: 1,000 mm) Approx. ø105 mm (Distance: 3,000 mm)	
Supply voltage	12 V DC to 24 V DC ±10%, Ripple P-P 10% or less	
Current consumption	40 mA or less	
Output	<NPN output> NPN transistor open-collector •Max sink current : 100 mA •Applied voltage : 30 V DC or less (between output - 0 V) •Residual voltage : 2 V or less (at 100 mA sink current) 1 V or less (at 16 mA sink current)	<PNP output> PNP transistor open-collector •Max source current : 100 mA •Applied voltage : 30 V DC or less (between output - +V) •Residual voltage : 2 V or less (at 100 mA source current) 1 V or less (at 16 mA source current)
Output operation	Switchable either Light-ON or Dark-ON	
Short-circuit protection	Incorporated (Auto reset)	
Response time (Note 3)	Within 50 ms (Sensing distance less than 900 mm) Within 100 ms (Sensing distance 900 mm or more)	
Emitting element	Class 1 laser (Note 4) Peak emission wavelength: 940 nm (Infrared invisible light)	
L-ON / D-ON indicator	Green LED (ON during L-ON mode, OFF during D-ON mode)	
BGS / FGS indicator	Green LED (ON during BGS mode, OFF during FGS mode)	
Operation indicator	Orange LED (ON during output ON, OFF during output OFF)	
Environmental resistance: Protection	IP67 (IEC)	
Environmental resistance: Ambient temperature	-25 to +55 °C, Storage: -30 to +70 °C (No dew condensation or icing allowed)	
Environmental resistance: Ambient humidity	35 to 85% RH, Storage: 35 to 85% RH	
Environmental resistance: Ambient illuminance	Incandescent light: 2,000 ℓx or less at the light-receiving face	
Environmental resistance: Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure	
Environmental resistance: Insulation resistance	20 MΩ or more with 250 V DC mega between all supply terminals connected together and enclosure	
Environmental resistance: Vibration resistance	10 to 500 Hz frequency, 1.5 mm double amplitude (maximum acceleration 100 m/s²), in X, Y and Z directions for two hours each (without power supply)	
Environmental resistance: Shock resistance	500 m/s² acceleration (approx. 50 G) in X, Y and Z directions three times each (without power supply)	
Material	Enclosure: PBT, Lens: PMMA, Button: PC+TPU M8 connector (**CX-F121-Z-W** only) : PBT	
Cable	0.2 mm² 4-core cabtyre cable, length: 2 m	— (Note 5)
Cable extension	Extension up to total 100 m is possible with 0.3 mm², or more, cable	
Weight	Net weight: Approx. 50 g, Gross weight: Approx. 60 g	Net weight: Approx. 7 g, Gross weight: Approx. 20 g

Notes: 1) This value is based on the white non-glossy paper (200 × 200 mm).
2) Value for BGS mode / 1-point teaching.
3) Response time may vary in abnormal environments or in the presence of noise.
4) In accordance with IEC 60825-1: 2014 (EN 60825-1; 2014/A11: 2021, JIS C 6802: 2014).
5) For the **CX-F121-Z-W**, be sure to use the following cable with connector (sold separately).
Straight type: **CN-24A-C2** (cable length: 2 m), **CN-24A-C5** (cable length: 5 m)
Elbow type: **CN-24AL-C2** (cable length: 2 m), **CN-24AL-C5** (cable length: 5 m)
6) Sensor mounting brackets (optional), **MS-CX2-1**, **MS-CX2-5** and **MS-CX-3**, are available. For more details, refer to our website.

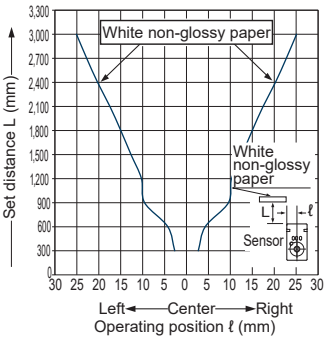
PRECAUTIONS FOR PROPER USE

Refer to the instruction manual for details.

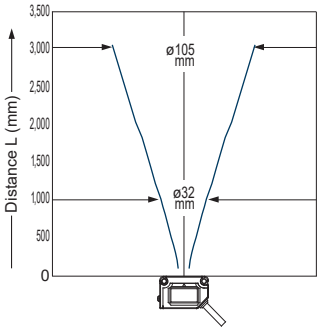
- Never use this product as a sensing device for personnel protection.
- In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.
- This product is classified as a Class-1 laser product under the IEC / EN / JIS standards. Do not look at the laser beam through an optical observation system such as a lens since doing so is very dangerous.

SENSING CHARACTERISTICS (TYPICAL)

Parallel deviation

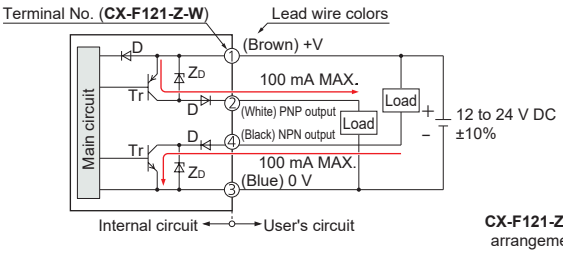


Emitted beam



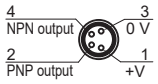
I/O CIRCUIT DIAGRAMS

Refer to the instruction manual for details.



Symbols ... D: Reverse supply polarity protection diode
Z_D: Surge absorption zener diode
Tr: Output transistor

CX-F121-Z-W terminal arrangement diagram

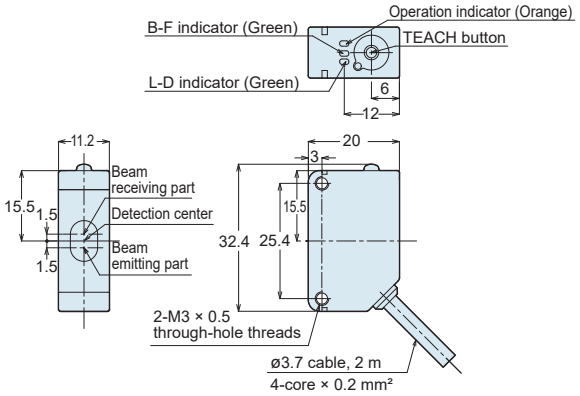


DIMENSIONS (Unit: mm)

The CAD data can be downloaded from the website.

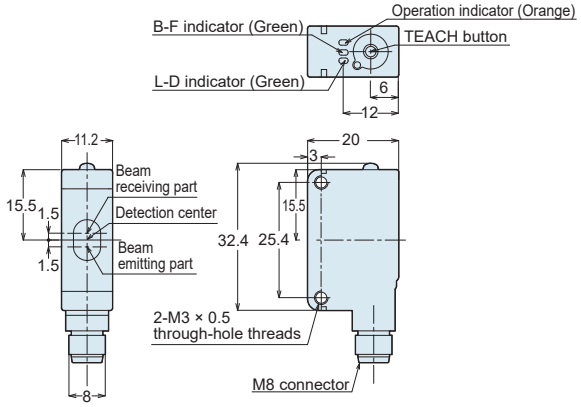
CX-F121-W

Cable type



CX-F121-Z-W

M8 connection type



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Specifications are subject to change without notice.
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