

Panasonic[®] INSTALLATION INSTRUCTIONS

Compact Laser Distance Sensor CX-F100 Series

MJE-CXF121WZ No.0107-35V

Thank you very much for purchasing Panasonic products. Read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product. Kindly keep this manual in a convenient place for quick reference.

⚠ WARNING

- Do not use this product as a sensing device for personal protection. Using this product as a sensing device for personal protection may result in death or serious injury.
- For sensing devices for personal protection, use products that conform to the laws and standards related to personal protection in each country, such as OSHA, ANSI, and IEC.
- This product is intended to be used to detect target objects and is not provided with control functions that prevent accidents to ensure safety.
- Avoid observing beams in a dark surrounding environment.
- Do not look at beams using an optical device such as an optical telephoto system.
- Never attempt to disassemble, repair, or modify this product.
- Control or adjustment according to procedures other than those provided in this Installation Instructions Manual may cause exposure to hazardous emitted laser beams.

1 SAFE USE OF LASER PRODUCT

- For the purpose of preventing any injury which may occur to the user by the use of the laser product in advance, the following standards have been established by the IEC Standards, EN Standards and JIS Standards.

IEC : IEC 60825-1:2014
EN : EN 60825-1:2014/A11:2021
JIS : JIS C 6802:2014

These standards classifies laser products according to the level of hazard and provide the safety measures for respective classes.

This product belongs to "Class 1 laser product" according to IEC 60825-1:2014(EN 60825-1:2014/A11:2021) "Radiation Safety of Laser Products".

- Explanation of hazard levels

Classification	Summary of hazard evaluation
Class 1	A laser that is safe when operated under operating conditions that can be reasonably foreseen.

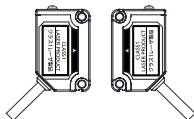
Note: When an unexpected failure occurs, dangerous radiation may be generated. Therefore, pay special attention to safety.

- Explanation label

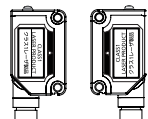


<Label position>

CX-F121-W



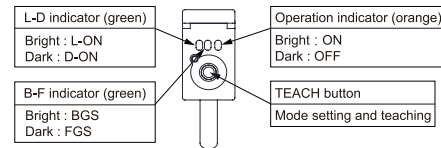
CX-F121-Z-W



2 CAUTIONS

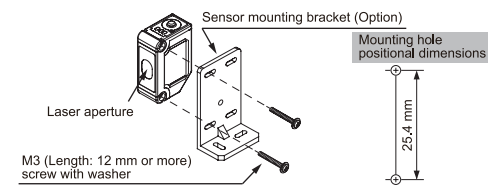
- This product has been developed / produced for industrial use only.
- Do not install the sensor in the following locations.
 - Locations subject to flammable gas, or corrosive gas
 - Locations subject to excessive dust
 - Locations subject to dust, metal particles, or saline matter
 - Locations where there are flammable objects in the surrounding area
 - Locations subject to benzene, paint thinner, alcohol or other organic solvents or strong alkaline solutions such as ammonia or caustic soda
 - Locations subject to severe vibration or shock
 - Locations subject to direct sunlight
 - Locations subject to oil, or chemicals
 - Locations where load is applied to the sensor unit
- This product is suitable for indoor use only.
- Do not use in an environment where the temperature changes dramatically and condensation is easy to attach.
- Make sure to carry out wiring in the power supply off condition.
- Extension up to total 100 m or less, is possible with more than 0.3 mm² of electric conductor cross-sectional area cable. However, in order to reduce noise, make the wiring as short as possible.
- When increasing the load, ensure that the current of the output line does not exceed 100 mA.
- Take care that wrong wiring will damage the sensor.
- Make sure that the stress by forcible bend or pulling is not applied directly to the sensor cable joint.
- Verify that the supply voltage variation is within the rating.
- Do not use during the initial transient time (Approx. 500 ms) after the power supply is switched on.
- Do not hit the button with a sharp object to avoid damage.
- The surrounding areas of the detection point generally have light leakage. If there are high reflectivity objects around the area around the detection point, you can be affected by it.
- When installing multiple units of this device, please ensure they are positioned to prevent mutual interference.
- If a regular reflection light enters the beam receiving window, proper measurement may not be possible. If the reflectance of the detected object is high, carefully select the installation location.

3 PART DESCRIPTION

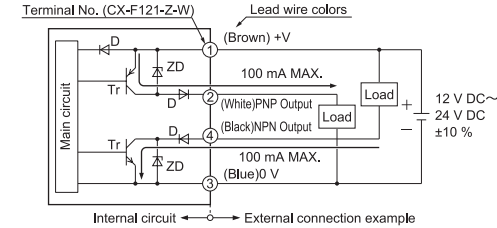


4 INSTALLATION

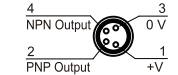
- When mounting this product, use M3 × 12 screws (prepare separately). The tightening torque should be 0.5 N·m or less.



5 WIRING DIAGRAMS

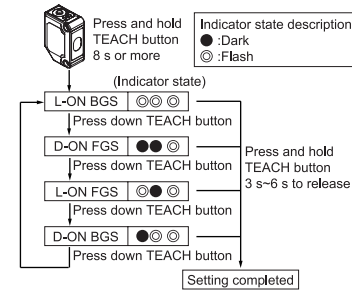


CX-F121-Z-W terminal layout



6 MODE SETTING

- Mode switching (L-ON/D-ON, BGS/FGS)



7 TEACHING

1-point teaching

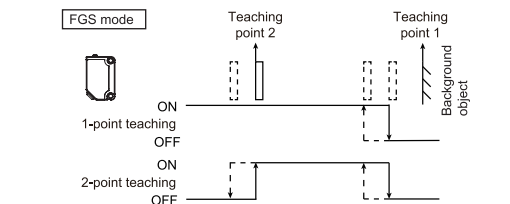
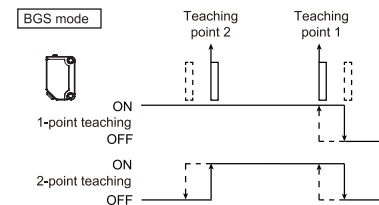
- With a detection object or background object at teaching point 1, press the TEACH button twice.
- When teaching is complete, the L-D indicator light (green) and B-F indicator light (green) will flash alternately.
- Check the operation.

2-point teaching

- With a detection object or background object at teaching point 1, press and hold the TEACH button for 2 to 5 seconds.
- The L-D indicator light (green) and B-F indicator light (green) will flash simultaneously.
- With a detection object positioned at teaching point 2, press the TEACH button.
- When teaching is complete, the L-D indicator light and B-F indicator light will flash alternately.
- Check the operation.

- If teaching fails
If teaching fails, the green and orange indicator lights will continue to flash alternately. In this case, press the TEACH button once to end teaching, after that, try teaching again.

- BGS / FGS output operation (In the case of L-ON)



8 SPECIFICATIONS

Model No.	CX-F121-W (Cable type) CX-F121-Z-W (M8 Connection type)
Setting range (Note 1)	100 mm ~ 3000 mm
Sensing range (Note 1)	50 mm ~ 3000 mm
Differential travel (Note1) (Note2)	Within 15 % of the detection distance. (Detection distance less than 900 mm) Within 8 % of the detection distance. (Detection distance 900 mm or more)
Light point diameter (Typical value)	Approx. Ø32 mm (Distance 1000 mm) Approx. Ø105 mm (Distance 3000 mm)
Supply voltage	12 V DC~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 (Detection distance 900 mm or less) Within 100 ms (Detection distance 900 mm or more)
Significance source	Class 1 laser product Peak emission wavelength :940 nm (Infrared invisible light)
Protection structure	IP67 (IEC)
Ambient temperature	-25 °C ~ +55 °C, Storage : -30 °C ~ +70 °C No dew condensation or no icing condition
Ambient humidity	35 %RH ~ 85 %RH, Storage :35 %RH ~ 85 %RH
Ambient illuminance	Incandescent light: 2,000 lx or less at the light-receiving face
Material	Enclosure :PBT, Lens :PMMA, Button :PC+TPU M8 connector (CX-F121-Z-W) :PBT
Cable (note 4)	0.2 mm ² 4-core cable, length :2 m
Weight	CX-F121-W Net weight :Approx. 50 g, Packing weight :Approx. 60 g CX-F121-Z-W Net weight :Approx. 7 g, Packing weight :Approx. 20 g

(Note 1) : This value is based on the white non-glossy paper (200 mm × 200 mm).
(Note 2) : Value for BGS mode/1-point teaching.
(Note 3) : Response time may vary in abnormal environments or in the presence of noise.
(Note 4) : For the CX-F121-Z-W, be sure to use the following cable with connector (sold separately).
CN-24A-C□, CN-24AL-C□

9 OPEN SOURCE SOFTWARE (OSS)

- This product includes the open source software (OSS).
 - Apache-2.0
 - BSD-3-Clause
- For information on the OSS, refer to our product page.
https://industry.panasonic.com/global/en/products/fasys/sensor/photoelectric/software/cx-f100_license

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<https://industry.panasonic.com/>

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