

Laser displacement sensor Operating instruction



- Please confirm whether the product meets your needs.
- Please read this manual thoroughly before use and strictly follow the instructions below.
- Please read the precautions in the instructions carefully and use it after understanding the relevant content.

⚠️ WARN Indicates that the use of this product without following the specified operating instructions may result in a degree of personal injury or property damage.

- ⚠️ WARN**
- The light source of this product uses a visible semiconductor laser. Do not directly or indirectly reflect a laser beam from a reflecting object into the eye. There is a risk of blindness if the laser beam enters the eye.
 - This product does not have explosion-proof structure. Do not use in flammable, explosive, explosive gas or explosive liquid environment.
 - Do not remove or alter this product as it is not designed to automatically turn off the laser emission when the body is turned on. Disassembly or modification of this product by the client may result in personal injury, fire or electric shock.
 - Use of controls, adjustments or procedures other than those specified herein may result in a dangerous release of radiation.

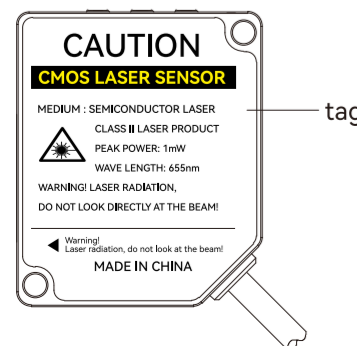
⚠️ Look out

- It is dangerous to connect or disconnect interfaces when the power is on. Be sure to turn off the power before operation
- Failure may occur when installed in the following locations.
 1. Places covered with dust or steam
 2. where corrosive gases will be generated
 3. will directly receive the spatter of water or oil location
 4. Places that have suffered severe vibration or shock
- This product is not suitable for outdoor use
- Do not use the sensor in an unstable state shortly after the power is turned on (about 15 minutes of warm up time)
- If switching power regulator must be used, please ground the grounding terminal
- Do not connect with high voltage cable or power line, operation failure will lead to induction or damage failure. Because each product is different, there may be slight differences in the detection characteristics of the workpiece.
- Do not use this product in water.
- Please do not disassemble, repair or modify this product without authorization, otherwise it may lead to electric shock, fire or injury to the human body.
- Dust off the transmitting or receiving elements to maintain proper detection. In addition, avoid direct impact of foreign objects on the product.
- Operate within the rated range.

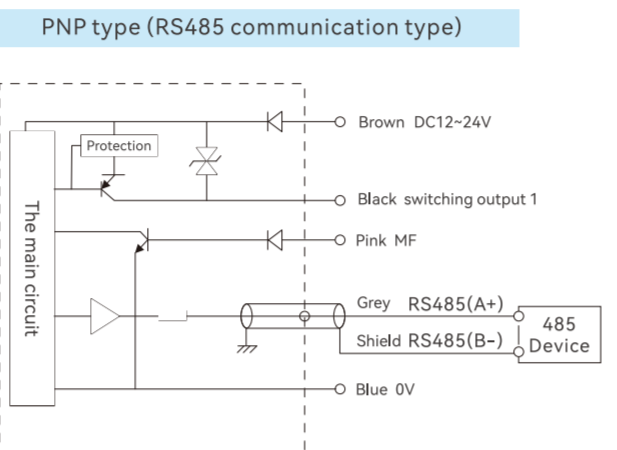
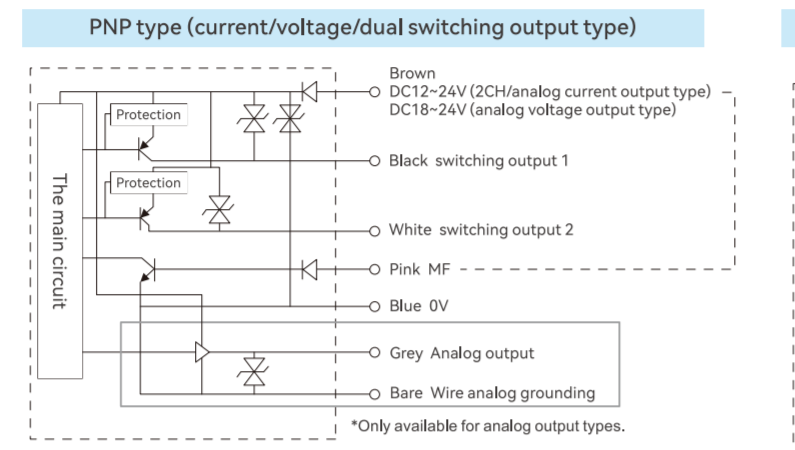
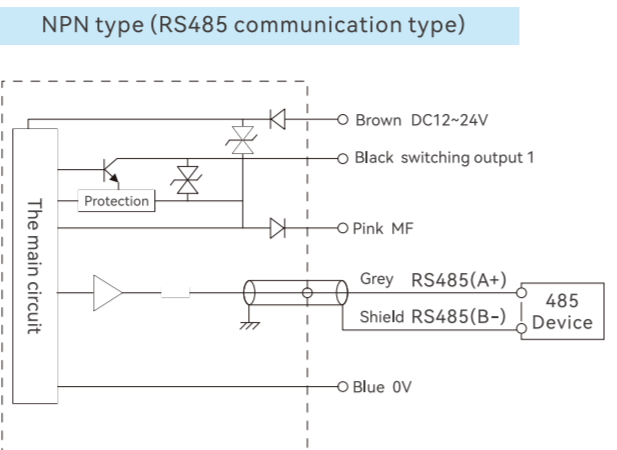
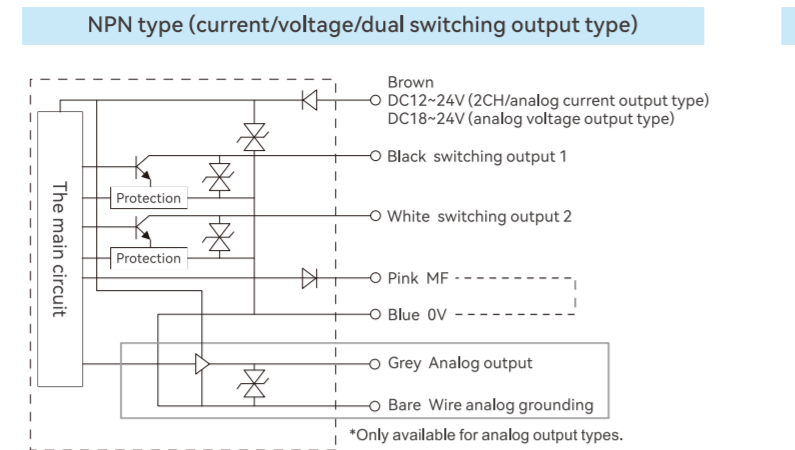
⚠️ This product cannot be used as a safety device to protect the human body

Laser use precautions

- Laser tag
- The product is classified as a Class 2 (III) laser product by the JISC6802/IEC/FDA laser safety standard. If the white laser label on the machine is covered when installing the product, attach the attached laser label in a visible position.



Wiring diagram



MF input (Multi-function input)

In the menu external input select: Zero, Teach, Stop laser.
 NPN type: Grey MF wire connected to the negative terminal of the power supply (0V) is more than 20ms and disconnected for triggering once.
 PNP model: The grey MF wire is connected to the positive electrode of the power supply (24V) for more than 20ms and disconnected for triggering once.

Note 1. Check whether the cables are correctly connected before switching on the power.
 In particular, the white line (analog output line) must not touch other lines.
 1. The blue wire (0V) and the shielded wire (mode is not grounded) are connected in the internal circuit. However, please use the blue wire (0V) to connect the negative terminal of the power supply, and the shielded wire (analog ground) is used to simulate the output.

Specification

Detection distance	30mm	50mm	85mm	120mm	250mm	
Detection range (f. s.)	±4mm	±10mm	±20mm	±60mm	±150mm	
Light source	Red semiconductor laser (Wavelength: 655nm, maximum output power: 1mw)					
Laser type	IEC/JIS	class2				
	FDA	classII				
Spot size * 1	Close range	0.15×0.15mm	0.6×1.2mm	0.9×1.5mm	1.2×1.8mm	1.5×2.5mm
	Center position	0.1×0.1mm	0.5×1.0mm	0.75×1.25mm	1.0×1.5mm	1.75×3.5mm
	Remote	0.15×0.15mm	0.4×0.9mm	0.6×1.0mm	0.5×0.8mm	2.0×4.5mm
Linear accuracy	±0.1%f.s. (f.s.=8mm)	±0.1%f.5. (f.s.=20mm)	±0.1%f.8. (f.s.=40mm)	±0.1%f.s. (f.s.=120mm)	±0.3%f.s. (f.s.=300nm)	
Resolution ratio	2μm (In fast mode 4μm)	5μm (In fast mode 8μm)	10μm (In fast mode 15μm)	30μm (In fast mode 45μm)	75μm (In fast mode 150μm)	
Response time * 2	Quick mode	Max.2ms: average sampling frequency 1 time (1ms)+sensitivity switching time (max.1ms)				max.2.5ms
	Standard mode	Max.11.5ms: average sampling frequency 16 times (8.5ms)+sensitivity switching time (max.3ms)				max.15.5ms
	High resolution mode	Max.36.5ms: Average sampling frequency 64 times (32.5ms)+sensitivity switching time (max. 4ms)				max.48.5ms
Sampling period	※ Factory value: 500 μs (250mm type: 750 μs)					
Temperature drift characteristics	±0.08%F.S./°C					
Pilot lamp	Distance indicator light	LED light display on the operation panel				
	Output indicator light	When in the ON state: Q1 and Q2 indicator lights (orange) are on				
MF input (multifunctional input)	Select from the external input menu: zero adjustment, teach, stop laser.					
	NPN model: The grey MF wire is connected to the negative pole (0V) of the power supply and disconnected for more than 20ms, which is considered to trigger once. PNP model: The grey M-line is connected to the positive pole (24V) of the power supply and disconnected for more than 20ms, which is considered as triggering once.					
Protection circuit	Reverse connection protection, overcurrent protection					
Protection level	IP64					
Operating environment temperature /humidity	-10~+45 °C (no icing)/35~85RH (no frost)					
Storage environment temperature /humidity	-20~60 °C (no icing)/35~95RH (no frost)					
Environmental illumination	Sunlight; Incandescent lamps below 10000lx; Below 3000lx					
Vibration resistance	10~55Hz dual amplitude 1.5mm, 2 hours in x, y, z directions					
Impact resistance	Approximately 50G (500m/s ²) X, 3 times in each direction of Y and Z					
Internal circuit stability time	About 1.5s					
Preheating time	Max. 15 minutes					
Material quality	Shell: aluminum alloy lens: PMMA					
Weight	Cable type	65g(Excluding cable lines)				
	Plug-in type	90g				

Output specification

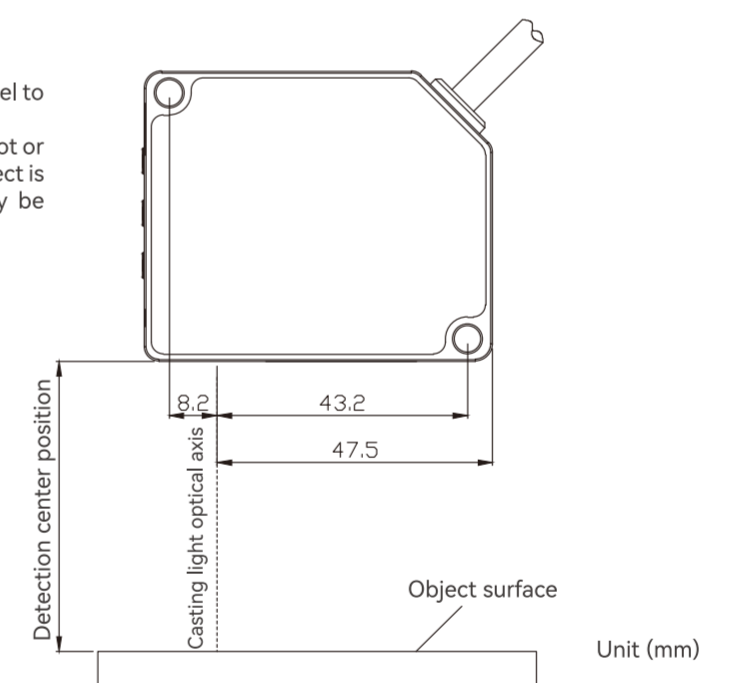
Model	Analog current output type		Analog voltage	RS485 comm
	EGFL-G-①		EGFL-G-②	EGFL-G-③
Supply voltage	DC12~24V (+10%/−5%)		DC18~24V (+10%/−5%)	DC12~24V (+10%/−5%)
Consumption current	Max 60mA with analog output value		Max 40mA	
Output	Switching output 1	NPN/PNP max 100mA/DC30V residual voltage 18V		—
	Switching output 2	NPN/PNP max 100mA/DC30V residual voltage 18V		—
	Analog output	4~20mA Load impedance: below 300 Ω	0~10V Output impedance: 100 Ω	—
Communication	—		RS485	
Connection type	Cable type*3	φ 5 6-core 2-meter long cable (PVC) AWG24	φ 5 8-core 2-meter cable (PVC) AWG24	

<Test conditions>
 The test conditions without special designation are: ambient temperature: 23°C (normal temperature), power supply voltage: DC24 V, response time: high-resolution mode, sampling period: 550μs, detection distance: center position, test target: 50 ×50mm white ceramic.
 *1 Defined by 1/e² (13.5%) of the center beam intensity. When there is light leakage outside the defined spot size range, or there is an object with a higher reflectivity than the object being measured around the beam, false detection may occur.

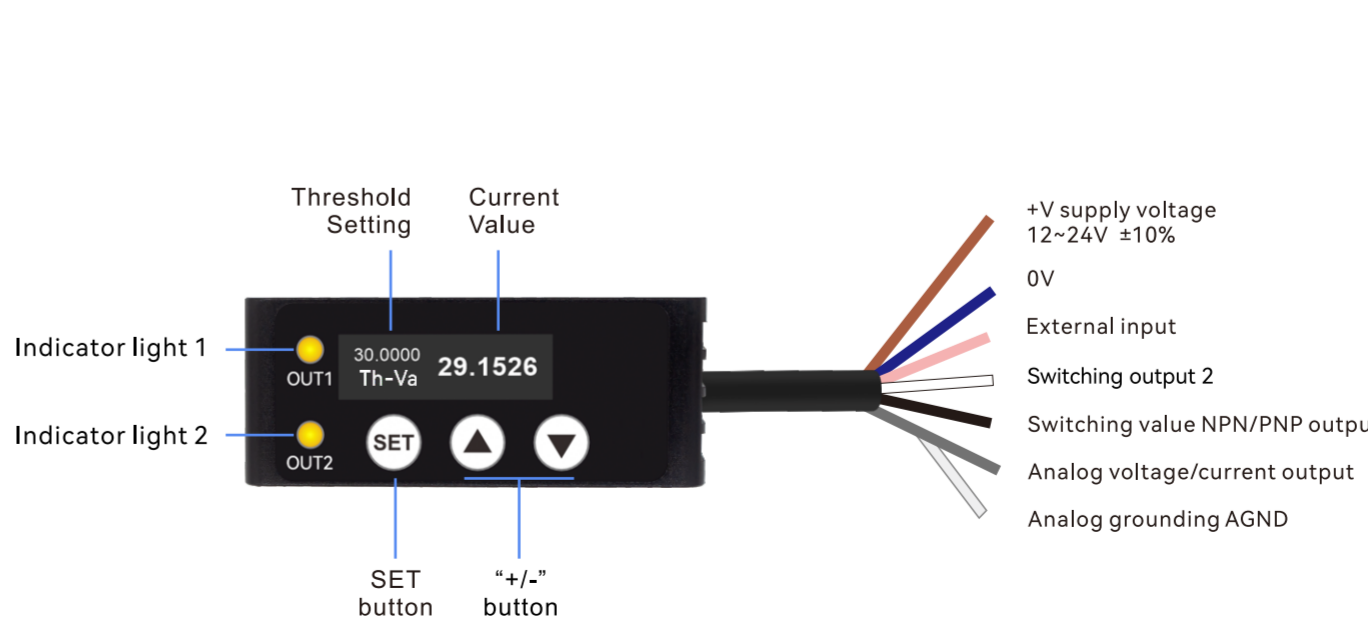
Mounting (diffuse reflection type)

In order to obtain a good detection position, install the detection surface as close as possible to the detection center of the sensor. Install the sensor using M4 screws with a tightening force smaller than 0.8N·m.
 For the installation method of the positive reflection type, please refer to the positive reflection type manual.

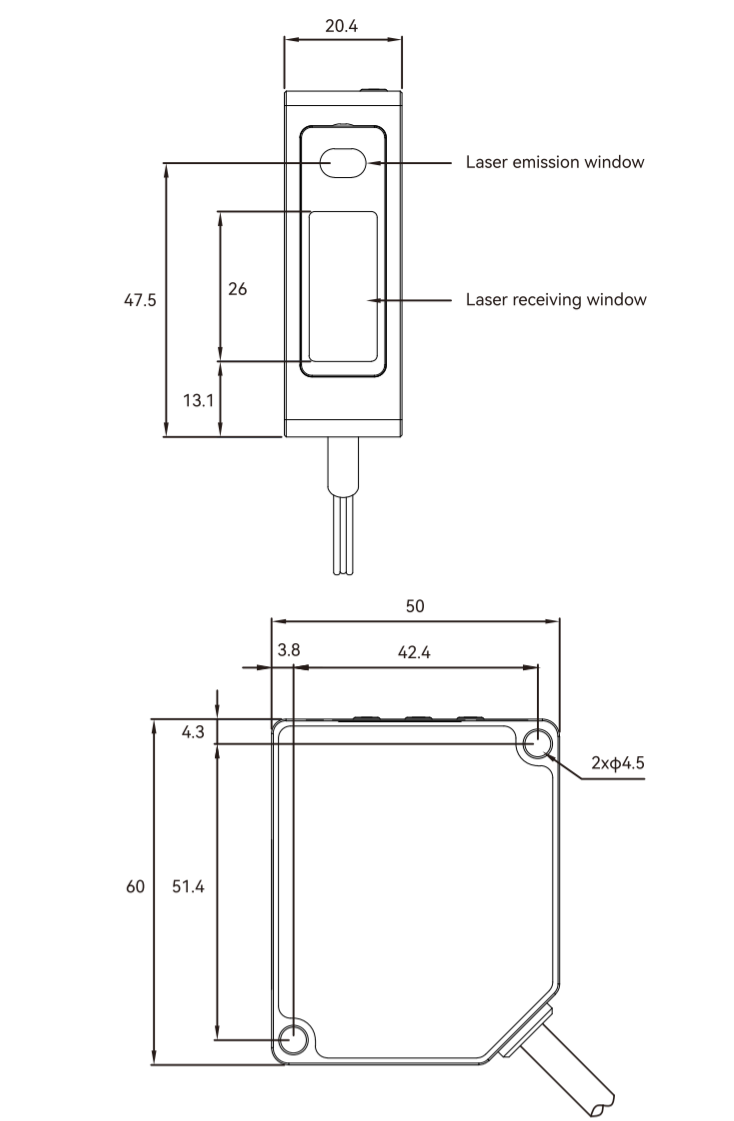
- When mounting, keep the lens surface of the sensor parallel to the surface of the object.
- Please note that when there is light leakage outside the spot or an object with a higher reflectivity than the measured object is present around the beam, the measurement error may be caused.



Name of operating unit

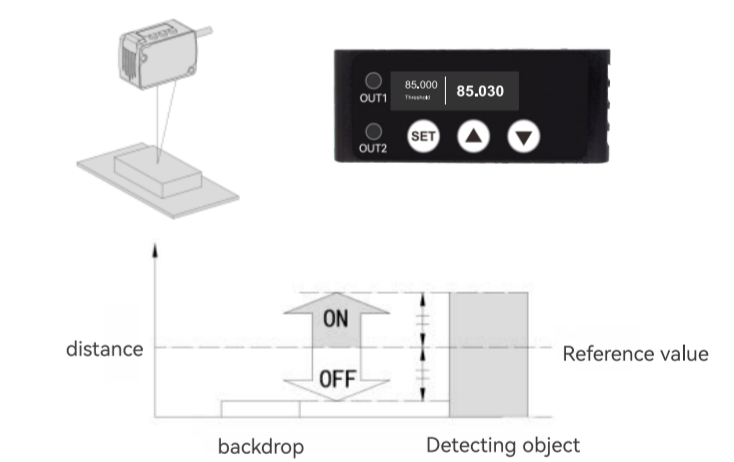


Outline dimensional drawing



Function setting procedure

indoctrination
 *2 teaching points:
 Basic instruction method
 ① In the state of no object, press the "SET" key.
 ② In the state of an object, press the "SET" key.
 ③ Complete the calibration. (When the difference between two teachings is small, the return difference is too small, and it is necessary to expand the difference and teach again)



* Qualified Teaching
 In the case of small objects and backgrounds, how to use this teaching method is very convenient.
 < In case of background reference >
 < In the case of detecting objects as benchmarks >

① In the state of the background object or in the state of the detected object, press the "SET" key.
 ② When the background object is the reference, press the "▲" key to set the reference value in the sensor. The value set in the checked object after pressing the "▼" key when the checked object is the base.
 ③ Complete the calibration.
 *1 point teaching (window comparison mode)
 - The method of setting the upper and lower limits is applied instead of the 1-point instruction for the distance from the datum surface of the detected object. This function is used to distinguish between the upper and lower limits.
 - In the case of 1-point teaching (window compare mode), please set it to [1-point teaching (window compare mode)] in the detection output setting of PRO mode.
 - For setting method, please refer to "PRO Mode Operation Instructions"

