

INSTRUCTION MANUAL

Laser Displacement Sensor

CD2S Series

Download the index list, the IO Device Description (IODD) file, and the users manual from the OPTEX FA website.
<https://www.optex-fa.com>



OPTEX FA CO., LTD.

Thank you for purchasing this Laser Displacement Sensor CD2S Series. Before using this product, please read this manual carefully to ensure proper use. Read this manual thoroughly, and then keep this manual at hand so that it can be used whenever necessary.

Safety Precautions

Safety precautions for ensuring safe operation of this product are displayed as follows with the following symbols. Precautions listed here describe important information about safety. Make sure to follow them accordingly.

Safety Symbols

	WARNING	Indicates that any improper operation or handling may result in moderate or minor injury, and in rare cases, serious injury or death. Also indicates a risk of serious property damage.
	CAUTION	Indicates that any improper operation or handling may result in minor injury or property damage.

WARNING	
	This product cannot be used in applications that directly or indirectly detect human bodies for the purpose of ensuring safety. Do not use this product as a detection device for protecting the human body.
	Do not disassemble, repair, modify, deform under pressure, or attempt to incinerate this product. Doing so may cause injury or fire.
	This product does not have a function that stops the emission of light from the laser during disassembly. Do not disassemble the product.
	Do not use this product underwater, as it may cause malfunction.
	This product is not explosion-proof and should not be used around flammable or explosive gases or liquids. Doing so may cause ignition resulting in an explosion or fire.
	Do not use air dusters or any spray that uses flammable gas around the product or on the inside of the product. Doing so may cause ignition resulting in an explosion or fire.
	Do not install this product in any of the following locations. Doing so may cause a fire, damage, or a malfunction. 1. Locations where dust, salt, iron powders, or vapor (steam) is present. 2. Locations subjected to corrosive gases or flammable gases. 3. Locations where oil or chemical splashes may occur. 4. Locations where heavy vibrations or impacts may occur. 5. Locations where the ambient temperature exceeds the rated range. 6. Locations subject to rapid temperature changes (or where condensation occurs). 7. Locations with strong electric or magnetic fields. 8. Locations subject to direct light.
	This is a class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.
	This product is not intended for use with nuclear power, railways, aviation, vehicles, medical equipment, food-handling equipment, or any application where particular safety measures are required. Absolutely do not use this product for any of these fields.
	Do not look directly at the laser beam or intentionally shine the laser beam in another person's eyes. Doing so may have adverse effects on the eyes, including temporary blindness.
	What to do in the event of a malfunction such as smoke being emitted from the product If you detect any malfunction including emission of smoke, abnormal smells or sounds, or the body becoming very hot, immediately stop operating the product and turn off the sensor power. Failure to do so may cause a fire. Repairing the product is dangerous and should in no way be performed by the customer. Contact an OPTEX FA sales representative for repairs.
	What to do if water enters the product If water or any other liquid enters the product or the cable, immediately stop operating the product and turn off the power. Using the product in this condition may cause a fire.

CAUTION

	Wire separately from high-voltage lines and power lines. Wiring them together may result in induction, which may cause malfunction or failure. If it is unavoidable, shield the wiring with a conductor such as conduit with grounding work done.
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CAUTION	
	Do not excessively twist or apply stress to the cable. Doing so may damage the cable or the connector.
	Do not drop the product or subject the product to strong impacts. Doing so may damage the product.
	Do not use this product in locations exposed to water or allowing it to get wet may affect detection performance.
	Follow the instructions in this manual or the specified instruction manual when wiring the product or the dedicated controller for the correct wiring method. Incorrect wiring can damage the product or the controller, or cause a malfunction.
	Do not bend the cable when below the freezing point. Doing so may cause the cable to break.
	Install this product as far away as possible from high-voltage equipment, power equipment, equipment that generates large switching surges, inverter motors, welders, or any equipment that can be a source of noise.
	Connecting or disconnecting the connector, make sure to hold it by the connector portion. Do not pull on the cable.
	When disconnecting the connector, do not touch the pins inside the connector and do not allow foreign objects to get inside.
	Use the product and dedicated controller within the rated ranges.
	Install this product and dedicated controller securely. Failure to ensure secure installation may result in the products falling and becoming damaged.
	Make sure to turn the power off before wiring the cable or connecting/disconnecting the connector. Performing work while the product is energized may damage it or cause electric shock.
	Use M3 screws and tightening torque of 0.6 N·m or less for mounting the product.
	The Ø0.8 mm hole on the side of the sensor (The side opposite the laser warning label. See "2. Dimensions.") is a watertight ventilation hole. To maintain the degree of protection, do not cover this hole or insert a sharp object into it.

NOTICE

- After carefully considering the intended use, required specifications, and usage conditions, install and use the product within the specified ranges.
- All specifications may be changed without notice.
- When using this product, it is the responsibility of the customer to ensure necessary safety designs in hardware, software, and systems in order to prevent any threat to life, physical health, and property due to product malfunction or failure.
- Do not use this product for the development of weapons of mass destruction, for military use, or for any other military application. Moreover, if this product is to be exported, comply with all applicable export laws and regulations, including the "Foreign Exchange and Foreign Trade Act" and the "Export Administration Regulations," and carry out the necessary procedures pursuant to the provisions therein.
- Before using this product, fully examine the applicable environmental laws and regulations, and operate the product in conformity to such laws and regulations. OPTEX FA does not assume any responsibility for damages or losses occurring as a result of noncompliance with applicable laws and regulations.
- If installing this product in your own equipment, ensure that the product is properly handled according to the laws and regulations of the relevant country or region.
- Individual differences in products and the condition of the object may cause differences in detection characteristics.

Precautions for Laser Use

- This product emits a class 1 visible laser beam that is compliant with IEC 60825-1 laser product safety standards. Labels for applicable standards are affixed to the product.
- If this product will be exported to the United States, approval must first be obtained from the FDA (Food and Drug Administration), the laser regulating body of the United States.
- A report for this product has been submitted to the CDRH (Center for Devices and Radiological Health).
- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure

Laser label



Symbol	Meaning
	Laser emission
	Class 1 laser product

Laser warning label position



Type of laser used in this product

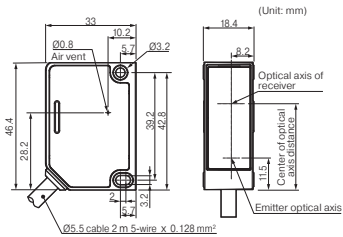
Type	Red semiconductor laser
Wavelength	655nm
Maximum output	0.39mW

1. Included Items

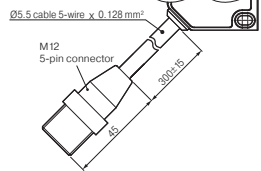
- Sensor
- Instruction manual
- M3×25 mm mounting screws ×2
- Washers, M3 nuts ×2 sets

2. Dimensions

Cable type

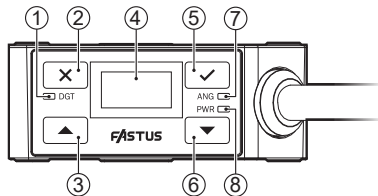


Pigtail cable type



Center of optical axis distance per model (Unit: mm)			
Model	CD2S-30(M12)	CD2S-50(M12)	CD2S-110(M12)
center of optical axis distance	27.3	29	30.3

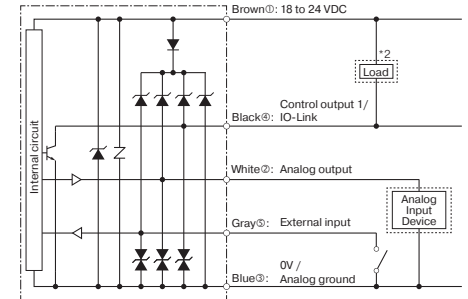
3. Part Names



No.	Part name	Description
①	Output indicator	Lits orange when control output is on and blinks red in the event of an error.
②	Cancel key (X)	Short press: Cancels the menu item. Long press: Changes the measurement value display from Measurement value (relative) to Measurement value (absolute).
③	Selection key (Δ)	Move setting menus or increase values when entering items.
④	Display	Shows measurement values and setting menus
⑤	Enter key (✓)	Short press: Move to setting screen, determine menu item, and enter setting range. Long press: Move to set screen, from Measurement value display.
⑥	Selection key (▽)	Move the setting menus or decrease values when entering items.
⑦	Analog output indicator	Lits orange when analog signal is output. Blinks red when laser is off.
⑧	Power indicator	Lits green when power is on and blinks green during IO-Link communication.

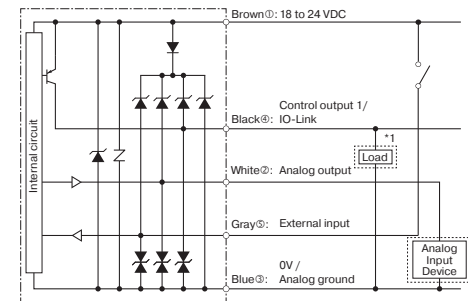
4. I/O Circuit Diagrams

NPN setting*1



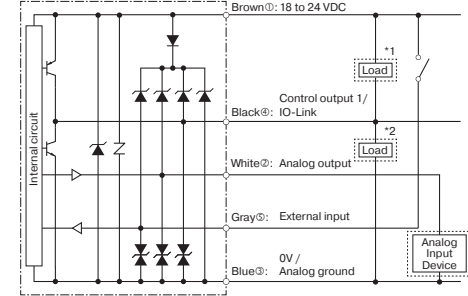
- *1: When connecting to the IO-Link with the NPN setting, use the IO-link master UR series of OPTEX FA or an IO-Link master that supports the sink type.
 *2: When used as control output 1.

PNP setting



- *1: when used as control output 1.

Push-pull setting



- *1: When used with NPN connection as control output 1.
 *2: When used with PNP connection as control output 1.

M12 connector pin assignments

