



Good Thinking, Good Future

Through-beam Edge Sensor

TD1 Series

TD1-010M8

*FASTUS is a product brand of OPTEX FA.

[Sold separately:
CDA-DM amplifier unit]

Edge Position Measurement for Any Workpiece



Suitable for
edge measurement
and width/gap
measurement

Light axis alignment
function for
easy installation

Easily readable
amplifier unit
Sold separately: CDA-DM

OPTEX FA CO., LTD.

Edge Measurement

The TD1 series is ideal for equipment where edge control is required, such as for measurement of the end surfaces of components or sheet materials.



Measurement range
10 mm

Measurement even at
up to 300 mm between heads

Through-beam edge sensor TD1 series devices use a CMOS sensor as the light receiving element, allowing for highly accurate edge position measurement of end surfaces.

Repeatability
 $\pm 5 \mu\text{m}$

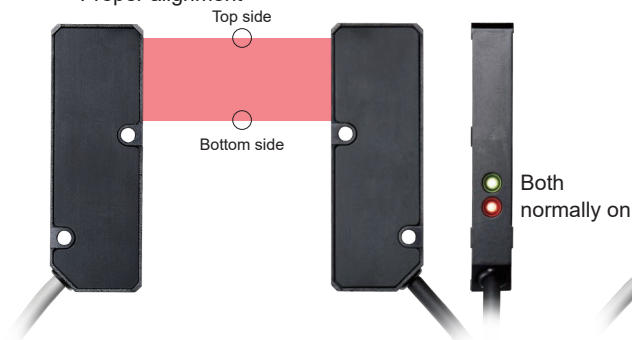
Linearity
 $\pm 0.4\%$
of F.S.

Easy Light Axis Alignment

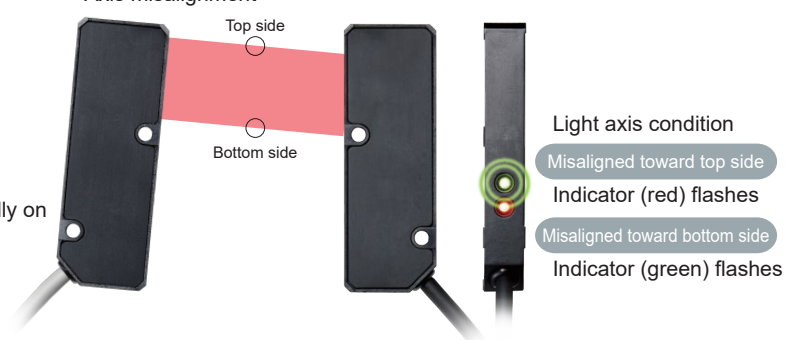
In Direction Checking mode, the indicator will flash when the light axis is misaligned, notifying that the alignment should be checked.

This makes it easier to check the light axis when installing sensors or during periodic maintenance.

■ Proper alignment



■ Axis misalignment



Compact Design

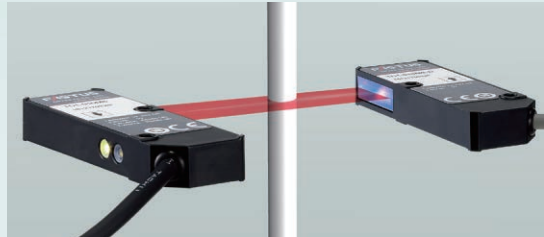
The compact size of the sensor head allows for easy installation even for devices with limited space. This makes it possible to keep equipment as small as possible.



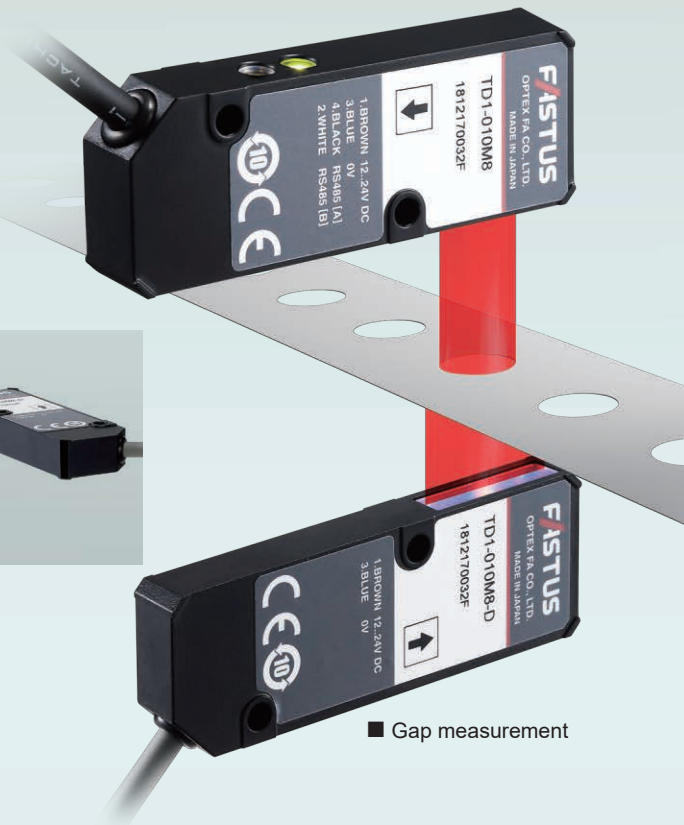
Width/Gap Measurement

The measurement method used in a TD1 series product can be changed to suit the inspection application, such as when measuring the width of small electronic components or the gaps between rollers.

■ Width measurement



■ Gap measurement



Displacement sensor amplifier unit

CDA series

CDA-DM

Features an organic EL display that can display clearly in both Japanese and English. Calculations can be performed with up to two TD1 series units.

[Actual size]

Easily readable display



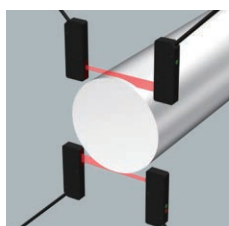
One-touch detection target position teaching

Simple Teaching Mode

When teaching, the edge center position can be set as desired within the measurement range. Simply place the measurement target and press the button.

Calculation Function

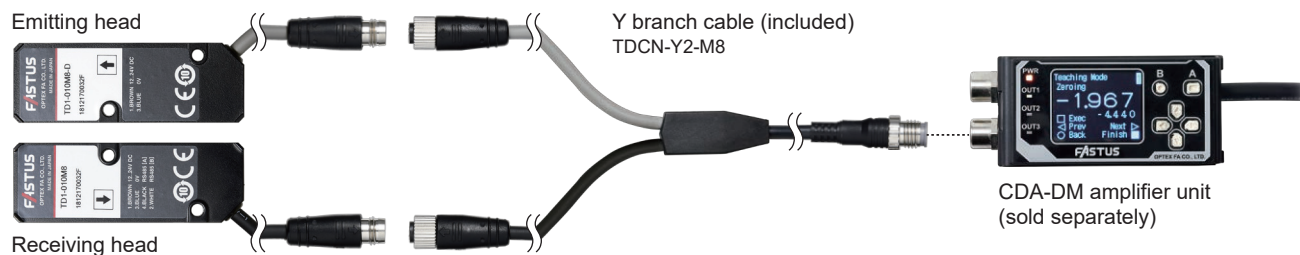
Connecting two TD1 series units enables measurement of workpieces with outer diameters of 10 mm or more.



Cylindrical workpiece outer diameter measurement



System Configuration Diagram



- Up to two units per amplifier

Options/Accessories

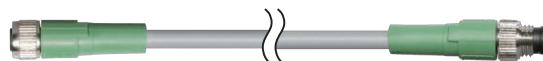
■ Amplifier unit

- CDA-DM Dual analog output type



■ Sensor-to-amplifier extension cable

- DSL-0804-G02M Cable length: 2 m, robot cable specification
- DSL-0804-G05M Cable length: 5 m, robot cable specification



- Ensure that the cable length when using a CDA series amplifier unit is within 10 m.

Specifications

■ Sensor head

| Model | | TD1-010M8 |
|--------------------------|------------------------------|---|
| Measurement range | | Edge: ± 5 mm, width: 10 mm |
| Distance between heads | | Max. 300 mm |
| Light source | Medium (Wavelength) | Red semiconductor laser (Wavelength: 660 nm) |
| | Maximum output | 390 μ W |
| Laser class | | Class 1 (IEC/JIS)*1 |
| Spot size | | 3 \times 14 mm |
| Linearity | | With a distance between heads of 100 mm: $\pm 0.4\%$ of F.S. (± 40 μ m) |
| Repeatability*2 | | ± 5 μ m |
| Sampling period | | 500 μ s |
| Temperature drift | | $\pm 0.02\%$ of F.S./ $^{\circ}$ C |
| Indicators | | [Emitting head] Power indicator: Green [Receiving head] Power indicator: Green, Alarm indicator: Red |
| Serial interface | | RS-485 |
| Supply voltage | | 12 to 24 VDC $\pm 10\%$ |
| Current consumption | | Emitting head: 20 mA or less (at 12 VDC) Light-receiving head: 80 mA or less (at 12 VDC) |
| Connection type | | Pig tail type: Cable with M8, 4-pin connector, 300 mm length |
| Environmental resistance | Ambient temperature/humidity | -10 to +50 $^{\circ}$ C / 35 to 85% RH (no freezing or condensation) |
| | Storage temperature/humidity | -20 to +60 $^{\circ}$ C / 35 to 85% RH (no freezing or condensation) |
| | Ambient illuminance | Sunlight: 10,000 lx or less, Incandescent lamp: 3,000 lx or less |
| | Vibration resistance | 10 to 55 Hz; double amplitude 1.5 mm; 2 hours in each of the X, Y, and Z directions |
| | Shock resistance | Approx. 50 G (500 m/s ²), 3 times in each of the X, Y, and Z directions |
| | Protection circuit | Reverse connection protection |
| | Degree of protection | IP50 |
| Applicable regulations | EMC | EMC directive (2014/30/EU) |
| | Environment | RoHS directive (2011/65/EU), China RoHS (Directive No. 32) |
| Applicable standards | | EN60947-5-2 |
| Material | | Housing: Aluminum die cast, Emitting/receiving part: Glass |
| Weight | | Emitting head, receiving head: 30 g each (including 300 mm connector cable) |

*1 Contact us for information on FDA Regulations.

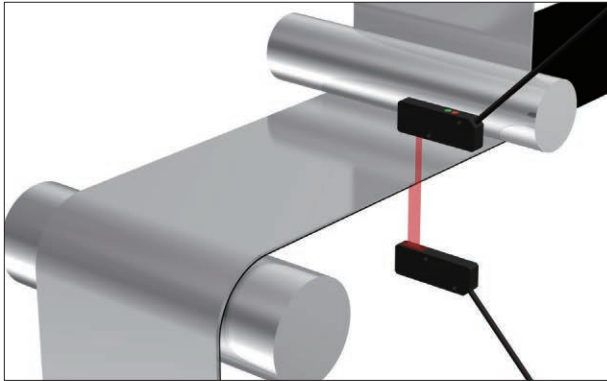
*2 With an averaging count of one.

■ Amplifier unit

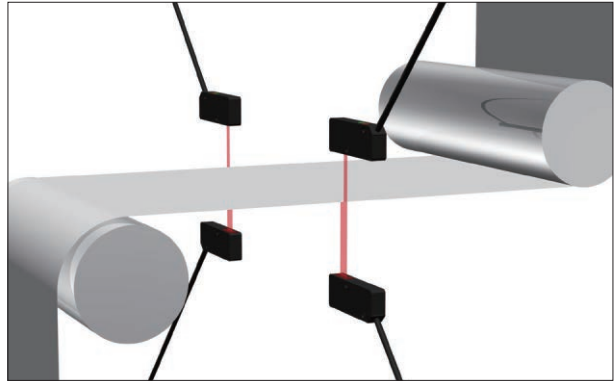
| Model | | Dual analog output type |
|--------------------------|------------------------------|---|
| | | CDA-DM |
| Sensor head | No. of connectable units | Max. 2 units |
| | Connection type | Amplifier side: M8, 4-pin connector |
| Display | Dot matrix display | Organic EL panel, 128 \times 96 pixels |
| | Indicators | Power indicator: Red/green, Output indicator: Orange |
| Supply voltage | | 12 to 24 VDC $\pm 10\%$, including 10% ripple (p-p) |
| Current consumption | | 100 mA or less (at 12 V) |
| Analog output | | Voltage type: 0 to 10 V, dual output |
| Control output | | NPN/PNP open collector (3 outputs), Max. 100 mA / 30 VDC, Residual voltage: 1.8 V or less |
| External input | | — |
| Connection type | | Cable type: Cable: 2 m ($\phi 5.8$) |
| Environmental resistance | Ambient temperature/humidity | -20 to +50 $^{\circ}$ C / 35 to 85% RH (no freezing or condensation) |
| | Storage temperature/humidity | -20 to +60 $^{\circ}$ C / 35 to 85% RH (no freezing or condensation) |
| | Vibration resistance | 10 to 55 Hz; double amplitude 1.5 mm; 2 hours in each of the X, Y, and Z directions |
| | Shock resistance | Approx. 50 G (500 m/s ²), 3 times in each of the X, Y, and Z directions |
| | Protection circuit | Reverse connection protection, overcurrent protection |
| Degree of protection | | IP50 |
| Material | | Housing: Polycarbonate |
| Weight | | 170 g |

Applications

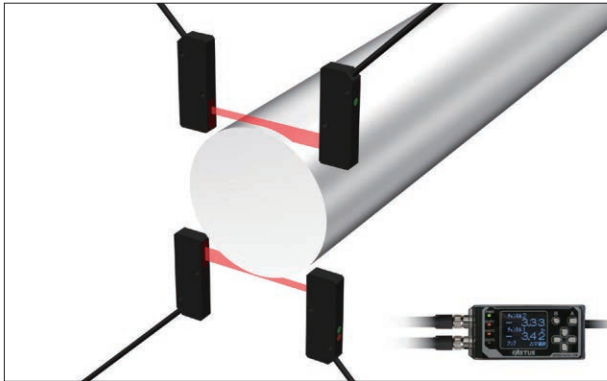
Sheet material winding control



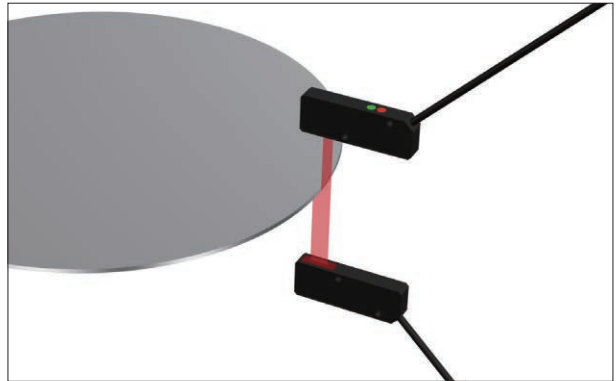
Sheet material meander control/edge measurement



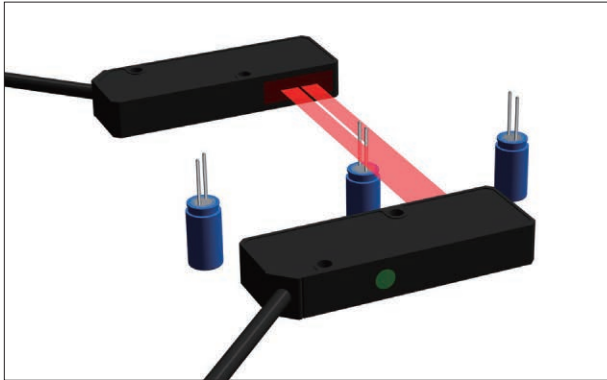
Cylindrical workpiece outer diameter measurement



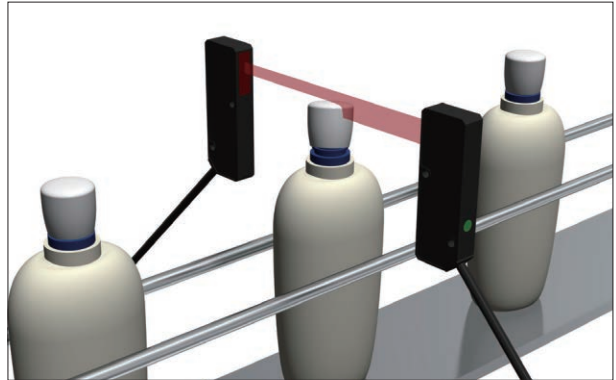
Wafer alignment



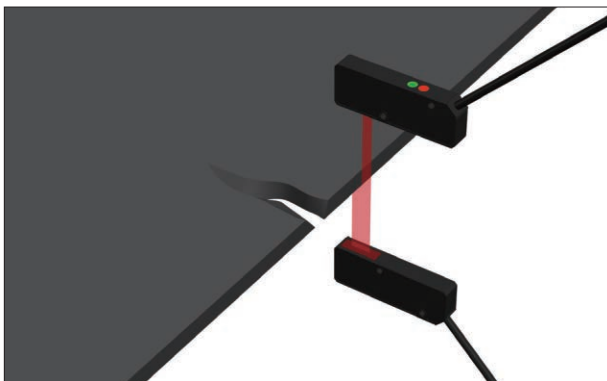
Electronic component orientation identification



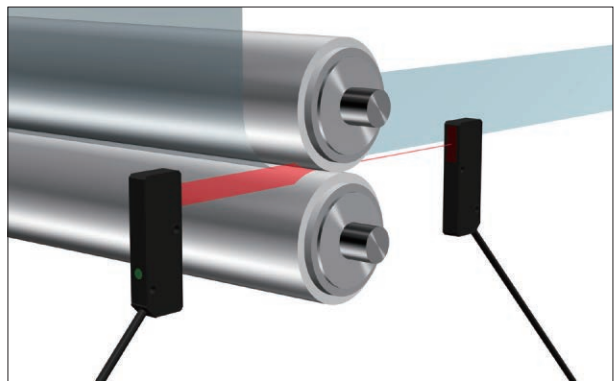
Bottle cap float detection



Rubber sheet defect inspection

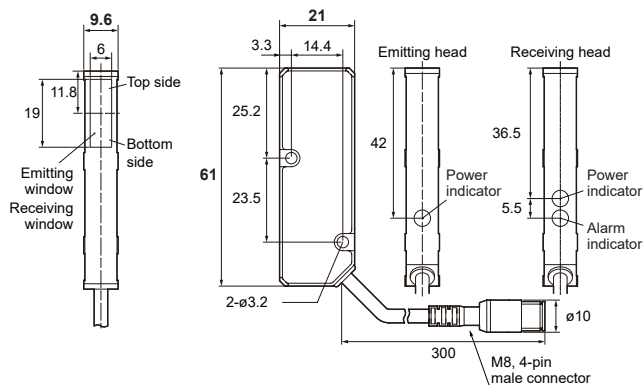


Roller gap measurement

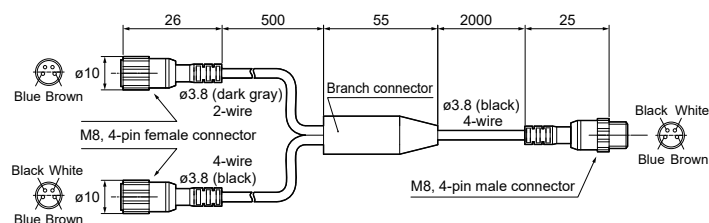


Dimensions (Unit: mm)

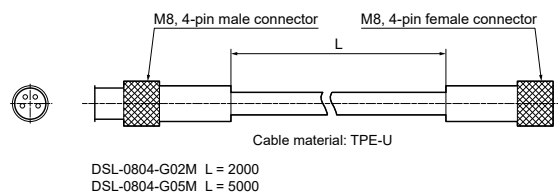
TD1 series



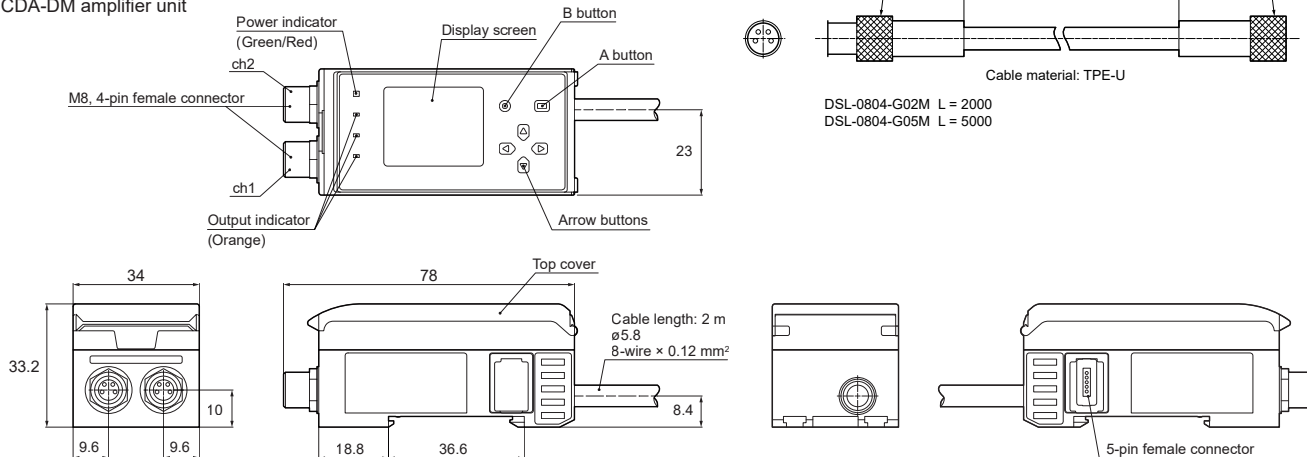
TDCN-Y2-M8 Y branch cable



DSL-0804-G02M / DSL-0804-G05M sensor-to-amplifier extension cable

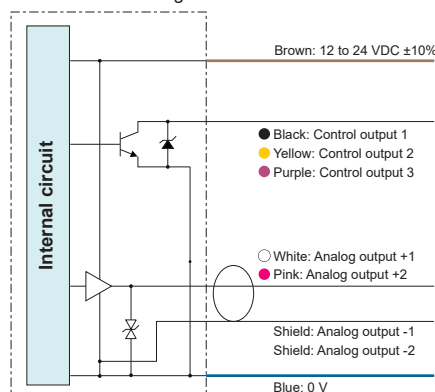


CDA-DM amplifier unit

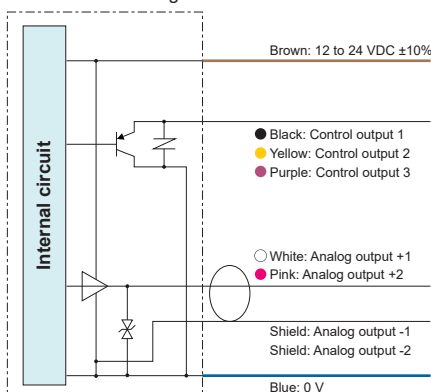


I/O Circuit Diagram (CDA-DM amplifier unit)

With the NPN setting



With the PNP setting



Attention: Not to be Used for Personnel Protection.

Never use these products as sensing devices for personnel protection. Doing so could lead to serious injury or death. These sensors do not include the self-checking redundant circuitry necessary to allow their use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition. Please consult our distributors about safety products which meet OSHA, ANSI and IEC standards for personnel protection.

- Specifications are subject to change without prior notice.
- Specifications and technical information not mentioned here are written in Instruction Manual. Or visit our website for details.
- All the warnings and cautions to know prior to use are given in Instruction Manual.



OPTEX FA CO., LTD.

91 Chudoji-Awata-cho Shimogyo-ku Kyoto 600-8815 JAPAN
TEL. +81-75-325-1314 FAX. +81-75-325-2936
<https://www.optex-fa.com>