



Best-in-class, All-in-one Middle-range Sensors

Highest-in-class Repeat Accuracy

Greatly enhanced repeat accuracy of $0.25 \mu\text{m}$ for short range and $10 \mu\text{m}$ for middle range of measurement distance

Highest-in-class Linearity

Improved linearity of $\pm 0.1 \%$ of F.S. for the measurement range of up to 700 mm

Wide Measurement Range

Extended measurement ranges with $350 \pm 250 \text{ mm}$ and $700 \pm 500 \text{ mm}$

Fastest-in-class Sampling Period of up to $133.3 \mu\text{s}$

8 levels of sampling period in addition to Auto mode can be selected for best measurement performance.

Industry-first Feedback-free High-speed Shutter

Real-time measurement is realized, as momentary errors of measurement and delay in response are eliminated.

Industry-first Easy-to-read OLED Display

Not only numeric values, but also system menu texts in 7 languages and graph or waveform of received light amount can be displayed.

IO-Link for Data Exchange with Control System

Process data and control outputs can be transferred via IO-Link network, as well as parameters of timer and maintenance data over acyclic communication.

Output Modes

Modes of 1 point, zone, FGS, and edge detection are available to meet application requirements.

Enhanced Built-in I/O Connectivity

1 selectable control/IO-Link output, 1 selectable control/analog output and 1 external input are equipped as standard.

I/O Configurable on System Menu

I/O Polarity, analog output, and external input modes can be selected in the system menu.

Measurement specifications

Model	Cable	CD2H-30A	CD2H-50A	CD2H-130	CD2H-2452	CD2H-3502	CD2H-7002
	M12 5-pin pigtail	CD2H-30M12A	CD2H-50M12A	CD2H-130M12	CD2H-245M122	CD2H-350M122	CD2H-700M122
Measurement range		30 +/- 5 mm	50 +/- 10 mm	130 +/- 70 mm	245 +/- 175 mm	350 +/- 250 mm	700 +/- 500 mm
Reflection mode		Diffuse reflective					
Light source		Red semiconductor laser, 655 nm					
Laser maximum output		0.39 mW			1 mW		
Laser class	JIS/IEC/FDA ^{*1}	CLASS 1 / Class I			CLASS 2 / Class II		
Spot size ^{*2}		Φ0.05 mm	Φ0.07 mm	Φ0.3 mm	Φ0.5 mm	Φ0.6 mm	Φ1.0 mm
Linearity		+/-0.1 % of F.S.					+/- 0.1 % of F.S. (200 to 700 mm) / +/- 0.3 % of F.S. (700 to 1200 mm)
Resolution ^{*3}		0.25 μm	0.25 μm	4 μm	10 μm	20 μm	100 μm
Repeat accuracy ^{*4}		0.25 μm	0.25 μm	4 μm	10 μm	20 μm	100 μm
Sampling period ^{*5}		133.3 μs / 150 μs / 200 μs / 300 μs / 500 μs / 1 ms / 2 ms / 5 ms / Auto					
Temperature characteristics ^{*6}		+/- 0.06 % of F.S./°C					
Weight		Cable models: Approx.140 g Connector models: Approx.90 g					

Measurement Condition

The measurement conditions are as follows unless otherwise designated:
 Ambient temperature: 25°C (Room temperature); Supply voltage: 24 V DC;
 Sampling period: 200 μs; Moving average performed: 128 times; Median filter: 31; at the center of measurement range, with a standard measured object (white ceramic). Furthermore, the sensor is fixed on an aluminum bracket when measurement is performed.

*1: In accordance with the FDA guidance of Laser Notice No. 56, the laser is classified per the IEC 60825-1:2014 standard.

*2: Defined with center strength 1/e² (13.5%) at the center of the measurement range. There may be leak light other than the specified spot size. The sensor may be affected when there is a highly reflective object close to the detection area.

*3: The smallest determinable step when changing the distance between the sensor and the target one step at a time (at moving average of 512)

*4: Peak to peak value of measurement in stationary state (at moving average of 512)

*5: Set to 200 μs by default.

*6: Typical example when the object (white ceramic) is measured while the object and the sensor are placed in place with aluminum brackets. This object is placed at the center of the measurement range.

Common specifications

Supply voltage		18 to 24 V DC (± 10 %, including ripple)
Current consumption ^{*7}		80 mA or less (at 18 V DC), 70 mA or less (at 24 V DC)
IO-Link Specification	Version	Ver.1.1
	Transmission rate	COM3 (230.4 kbps)
	Number of process input data bytes	6 bytes
	Min. cycle time	0.7 ms
Control output (DO1/DO2 ^{*8})	No. of outputs	2 (DO1 can be switched to IO-Link)
	Type	NPN/PNP open collector or Push-Pull (selectable by setting), max. 100 mA / 24 V DC, residual voltage 1.8 V or less
Analog output AO ^{*9}	Current	4 to 20 mA, Load impedance: 300 Ω or less
	Voltage	0 to 10 V, Output impedance: 100 Ω or less
External input ^{*9}		Switchable among not used, teach, hold, offset, and laser off
Display		0.9-inch OLED display Menu languages: English, German, Japanese, Korean, Simplified Chinese, Spanish, Traditional Chinese
Indicators		Power indicator (green), flush during IO-Link communication / Output indicators (orange x 2)
Connection		Cable models: φ4.5 2 m cable, Connector models: M12 5-pin 300 mm pigtail cable Minimum bending radius: Cable diameter x 2 (fixed mount), Cable diameter x 6 (when movable)
Protection circuit		Reverse connection protection, Overcurrent protection
Environmental resistance	Degree of protection	IP67 (Connector models require a YF2A15-***VB5XLEAX or DOL-1205-G**M-R cable connected)
	Ambient temperature/humidity	-10 to +50 °C / 35 to 85 % RH (without freezing or condensation)
	Storage temperature/humidity	-20 to +60 °C / 35 to 85 % RH (without freezing or condensation)
	Ambient illuminance	Incandescent light: 10000 lx Max. Fluorescent light: 10000 lx Max.
	Vibration resistance	10 to 55 Hz Double amplitude 1.5 mm, 2 hours in each X, Y, Z direction
	Shock resistance	500 m/s ² (Approx. 50 G) 3 times in each X, Y, Z direction
Applicable regulations	EMC	EMC Directive (2014/30/EU)
	Environment	RoHS Directive (2011/65/EU), China RoHS (Directive No. 32)
	Safety	FDA Regulations (21 CFR 1040.10 and 1040.11) ^{*10}
Applicable standards		EN 60947-5-2, IEC 60825-1
NRTL Certification		UL Recognized Components Proximity Switch Certified for US and Canada.
Warm-up time		Approx. 30 minutes
Material		Housing: PBT, Front window: PMMA
Included accessories		M4 x 35mm mounting screws x 2, Washers x 2, M4 nuts x 2

*7: When 21 mA is output through DO2 upon measurement error.

*8: Set to analog current output by default.

*9: Set to laser off by default.

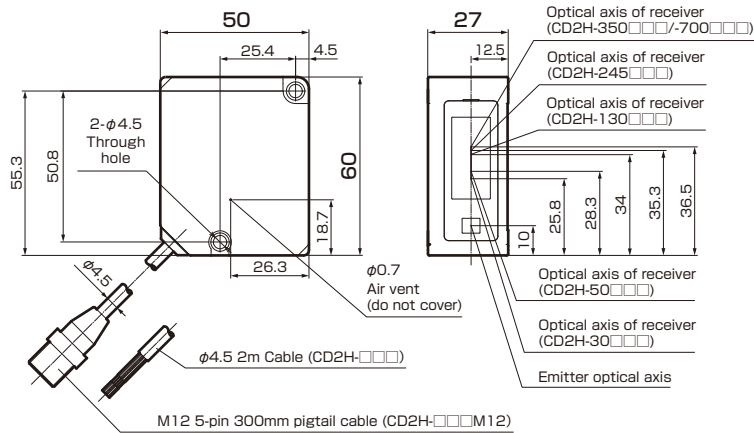
*10: Excluding differences per Laser Notice No. 56.

Process data over IO-Link

No	Bit	Variable
1	Control output 1 & 2	Measured distance
2		Received light amount
3		Timer duration
4		Edge value of output 1
5		Edge value of output 2

Dimensions (mm)

Sensor

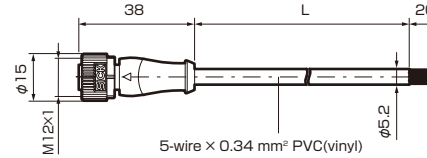


Accessories

M12 5-pin cable

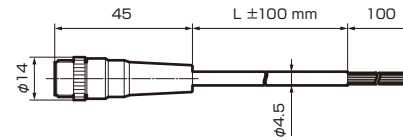
Standard cable

- YF2A15-020VB5XLAX (L=2,000)
- YF2A15-050VB5XLEAX (L=5,000)
- YF2A15-100VB5XLEAX (L=10,000)



Bending resistant cable

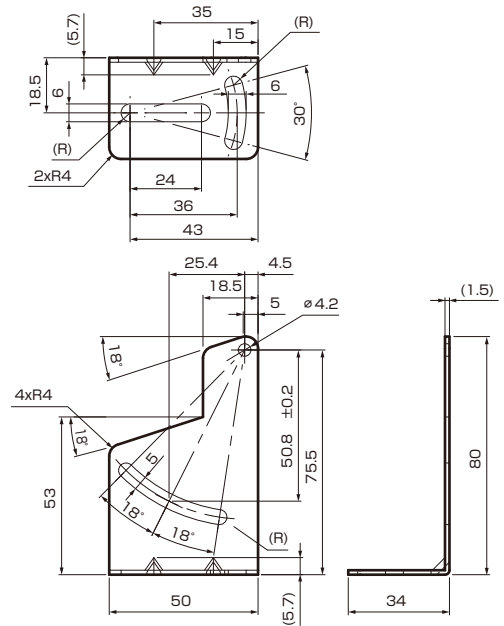
- DOL-1205-G02M-R (L=2,000)
- DOL-1205-G05M-R (L=5,000)



Cable section material : PVC
Conductor cross-section : 5-wire × 0.3 mm²

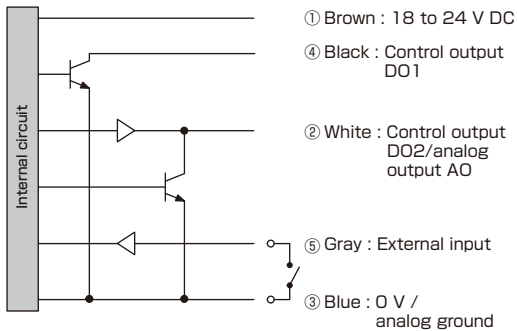
Mounting bracket

BEF-WN-OD2000-B

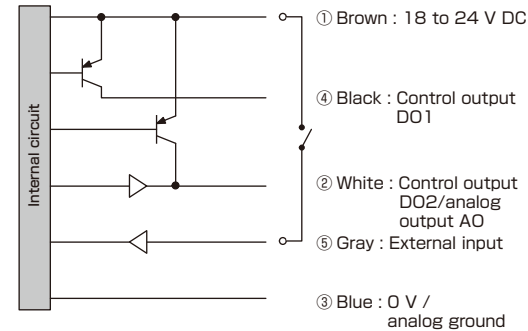


I/O circuit diagram

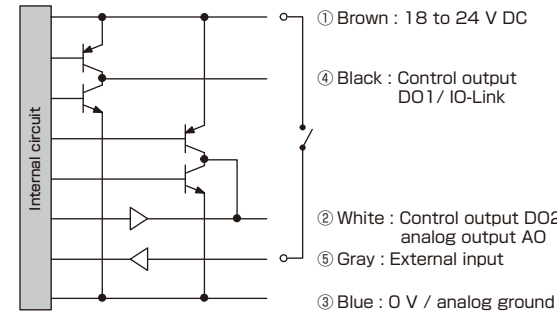
SIO mode (standard I/O mode) with the NPN setting



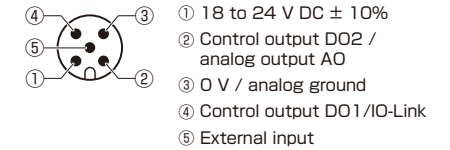
SIO mode (standard I/O mode) with the PNP setting



IO-Link mode or the Pushpull setting



M12 connector pin assignments



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www.optex-fa.com

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Thailand	OPTEX (Thailand) Co., Ltd.	Bangkok	+66-2-168-3162	thailand@optex-fa.com
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