Panasonic

Amplifier-separated Type

Digital Laser Sensor

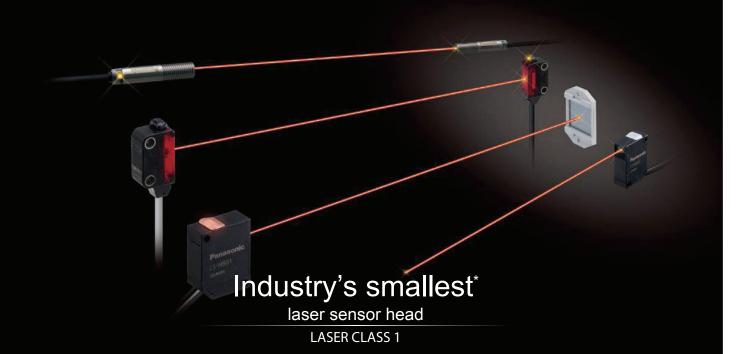
LS-500 SERIES

Got Questions?
Have a Tough Application?





Contact Ramco Innovations today!





Connectable to CC-Link communication unit SC-GU3-01

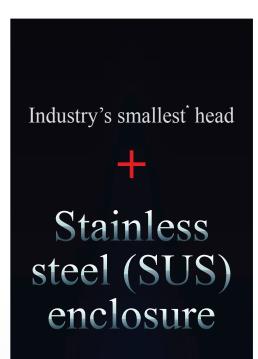
Connectable to **DeviceNet** communication unit **SC-GU3-02**

Connectable to **EtherCAT** communication unit **SC-GU3-03**

email: nsales@ramcoi.com

2016.05 panasonic.net/id/pidsx/global

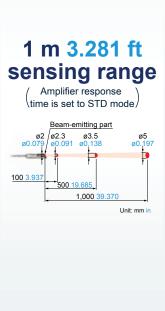
Smallest amplifier-separated type laser sensor nead as of September 2014 based on research conducted by our company

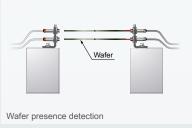


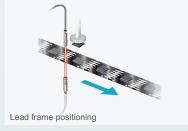
Featuring stainless steel (SUS) enclosure that won't break when bumped during installation or maintenance.

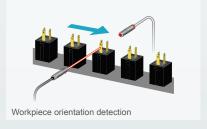




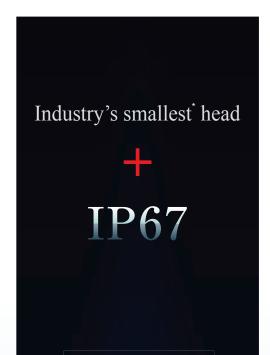








^{*} Smallest amplifier-separated type laser sensor head as of September 2014 based on research conducted by our company



Featuring waterproof IP67 to allow use in the presence of large amounts of water or dust.



Simple positioning

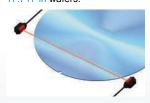
Check the optimal light receiving position at a glance while watching the red spot on the beam axis adjustment screen.



1 m 3.281 ft sensing range

(Amplifier response) time is set to STD mode/

Delivers sufficient sensing range for use with 450 mm 17 in wafers.



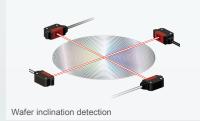
Two-point installation

The thru-beam type **LS-H102** features the same form as the EX-L200 amplifier built-in ultra-compact laser sensor. And it can be used as an EX-L200 with a digital indicator.



EX-L211 / EX-L212 Same installation

pitch as the EX-L200



Thru-beam Square type

LS-H102





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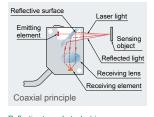
Featuring a 60% smaller design (by volume) than previous coaxial reflective models, our smallest unit is smaller in every dimension at just W8 × H23 × D18 mm W0.315 × H0.906 × D0.709 in (excluding indicators).





Coaxial design

By using a laser which goes straight in a coaxial design, the LS-H201 is able to detect stably in confined spaces and simple installation can be achieved.

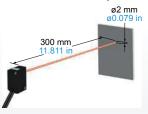


Reflective type photoelectric sensor



Small, long-range spot

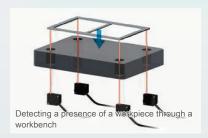
The LS-H201 produces a spot of ø2 mm ø0.079 in at a sensing range of up to 300 mm 11.811 in (amplifier response time is set to STD mode).



Easy-to-see operation indicator

Visible from all directions.









^{*} Smallest amplifier-separated type laser sensor head as of September 2014 based on research conducted by our company



The light source is positioned in the center of the sensor head, which helps to design easier.





Industry's smallest* and thinnest design

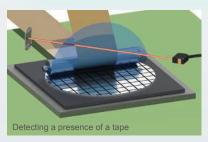
Size just as thin as W8 × H23 (excluding indicators) × D18 mm W0.315 × H0.906 × D0.709 in.

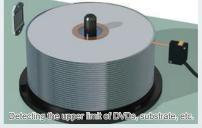
Sensing range of 10 mm to 1 m 0.394 in to 3.281 ft

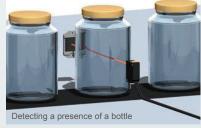
Amplifier response time is set to STD mode/

Good to perform detection at close range.

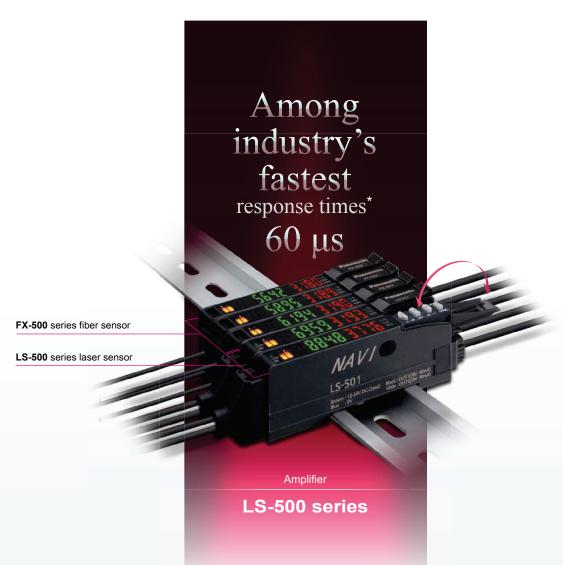








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Enhanced compatibility with fiber sensors in shape and operability.

It is easier to select and add laser sensors which have a lot of convenient features in common with fiber sensors.

Increased compatibility with fiber sensors

The **LS-500** series features the same operation, menu displays, and shape.

Detection of beam axis misalignment Dual outputs (self-diagnosis output)

Light intensity deterioration due to dust accumulation can be notified as an alarm output. Output 2 can be set to self diagnosis output. When the teaching of output 1's threshold value is carried out, output 2 is set concurrently with the setting randomly shifted by the amount of surplus of threshold value.

Stable sensing over the long term

Equipped with the threshold value tracking function. This contributes to maintain stable detection over the long term as well as to reduce maintenance man-hours. In order to track the light amount change due to environmental factors (such as dust accumulation), the incident light intensity can be checked in a certain cycle and threshold value is reset automatically.

Logic operations

Three logic operations (AND, OR, XOR) can be performed with laser sensor only. A dedicated controller is not required and the wire saving and cost reduction are both achieved. Compatible with the **FX-500** series.

Data bank

Eight sets of amplifier settings can be stored in the unit's built-in memory. The ability to save and load settings reduces workload when changing the setup in a multi-model production environment.

^{*} Smallest amplifier-separated type laser sensor head as of September 2014 based on research conducted by our company

■ ORDER GUIDE

Sensor heads

Туре		Appearance	Model No.	Sensing range ■: HYPR ■: U-LG ■: LONG ■: STD ■: FAST ■: H-SP
Thru-beam type	Cylindrical		LS-H101	1 m 3.281 ft
	Square		LS-H102	1 m 3.281 ft 1 m 3.281 ft
Coaxial reflective type			LS-H201	750 mm 29.528 in 600 mm 23.622 in 450 mm 17.717 in 300 mm 11.811 in 200 mm 7.874 in 150 mm 5.906 in
Coaxial retroreflective type		900	LS-H901	0.01 to 2.5 m 0.033 to 8.202 ft 0.01 to 1.5m 0.033 to 6.562 ft 0.01 to 1 m 0.033 to 3.281 ft 0.01 to 1 m 0.033 to 3.281 ft 0.01 to 1 m 0.033 to 3.281 ft

5 m 16.404 ft cable length type

5 m 16.404 ft cable length types (standard: 2 m 6.562 ft) are available. When ordering this type, add "-C5" at the end of the model number.

LS-H101-C5 LS-H201-C5 LS-H201-C5

Package without reflector

The **LS-H901** is also available without a reflector (**RF-330**).

When ordering this type, add "-Y" at the end of the model number.

LS-H901-Y

Amplifiers

Туре	Appearance	Model No.	Output	Connection method
Commenter to the	MV	LS-501	NPN open-collector transistor two outputs	Llas misk sampation askla (antional)
Connector type		LS-501P	PNP open-collector transistor two outputs	Use quick-connection cable (optional)
Cable type /With external		LS-501-C2	NPN open-collector transistor two outputs	2 m 6.562 ft cabtyre cable (6-core) included
(input		LS-501P-C2	PNP open-collector transistor two outputs	Cable outer diameter: ø4 mm ø0.157 in

Quick-connection cables Quick-connection cable is not supplied with the connector type amplifier. Please order it separately.

Туре	Appearance	Model No.	Description		
		CN-74-C1	Length: 1 m 3.281 ft		
Main cable (4-core)		CN-74-C2	Length: 2 m 6.562 ft	0.2 mm² 4-core cabtyre cable, with connector on one end Cable outer diameter: ø3.3 mm ø0.130 in	
		CN-74-C5	Length: 5 m 16.404 ft		
		CN-72-C1	Length: 1 m 3.281 ft	0.2 mm² 2.2 mm² cabh ma achla with agrasatan an ana	
Sub cable (2-core)		CN-72-C2	Length: 2 m 6.562 ft	O.2 mm² 2-core cabtyre cable, with connector on one end Cable outer diameter: ø3.3 mm ø0.130 in Connectable to a main cable up to 15 cables.	
		CN-72-C5	Length: 5 m 16.404 ft	Connectable to a main capie up to 10 capies.	

Connector

Туре	Appearance Mode		Description
Connector for amplifier	The state of the s	CN-EP4	Connector included with sensor head Use for maintenance, for example when another connector is damaged. Five pcs. per set

■ ORDER GUIDE

End plates End plates are not supplied with the amplifier. Please order them separately when the amplifiers are mounted in cascade.

Appearance	Model No.	Description
	MS-DIN-E	When amplifiers are mounted in cascade, or when an amplifier moves depending on the way it is installed on a DIN rail, these end plates clamp amplifiers into place on both sides. Make sure to use end plates when cascading multiple amplifiers together. Two pcs. per set

Accessories

MS-LS-1 (Sensor head mounting bracket) For LS-H201 / LS-H901



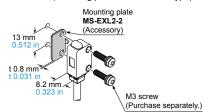


Foot angled Back angled mounting mounting

Material: Stainless steel (SUS304) Two M2 (length 12 mm 0.472 in) screws with washers [stainless steel (SUS)] are attached. RF-330 (Reflector)



MS-EXL2-2 (Mounting plate for thru-beam type)



Material: Stainless steel (SUS304)

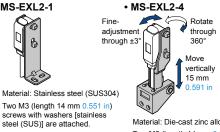
■OPTIONS

Designation	Model No.	Description		
	MS-EXL2-1	For LS-H102□ (square type) Foot angled mounting bracket		
Sensor head mounting bracket	MS-EXL2-4	For LS-H102□ (square type) Universal sensor mounting bracket		
bracket	MS-EXL2-5	For LS-H102□ (square type) Back angled mounting bracket		
Amplifier mounting bracket	MS-DIN-2	Mounting bracket for amplifier		
Amplifier protective seal FX-MB1 10 sets of 2 communication window seals and 1 connector seal Communication window seal: It prevents malfunction due to transmission signal from another amplifier, effect on another amplifier. Connector seal: It prevents contact of any metal, etc., with the pins of the quick-connection cable.				
Reflector	RF-310 For coaxial retroreflective type Compact reflector Sensing r		Sensing range:	
Reflective tape	RF-31	For coaxial retroreflective type Size: 9.2 × 9.2 × t 0.4 mm 0.362 × 0.362 × t 0.016 in	0.01 to 1 m 0.033 to 3.281 ft	
renconve tape	RF-33	For coaxial retroreflective type Size: 25.2 × 27.8 × 10.4 mm 0.992 × 1.094 × t 0.016 in	Sensing range: Same as the RF-330 .	

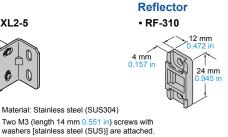
Sensor head mounting bracket



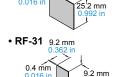








Reflective tape • RF-33



Material: Die-cast zinc alloy

Two M3 (length 14 mm 0.551 in) screws with washers [stainless steel (SUS)], one M3 (length 10 mm 0.394 in) hexagon-socket-head bolt [stainless steel (SUS)], and one M3 hexagon nut [stainless steel (SUS)] are attached.

Amplifier mounting bracket



Amplifier protective seal



■ SPECIFICATIONS

Sensor heads

	Туре	Thru-be	am type	Coaxial reflective	Coaxial retroreflective			
Турс		Cylindrical	ylindrical Square type		type			
Iten	Model No.	LS-H101	LS-H102	LS-H201	LS-H901			
Арр	licable amplifiers		LS-501(P), LS-50	01(P)-C2 (Note 2)				
3,4)	H-SP	1 m 3.281 ft	1 m 3.281 ft	150 mm 5.906 in	0.01 to 1 m 0.033 to 3.281 ft			
ote 3	FAST	1 m 3.281 ft	1 m 3.281 ft	200 mm 7.874 in	0.01 to 1 m 0.033 to 3.281 ft			
Sensing range (Note 3,4)	STD	1 m 3.281 ft	1 m 3.281 ft	300 mm 11.811 in	0.01 to 1 m 0.033 to 3.281 ft			
	LONG	1 m 3.281 ft	1 m 3.281 ft	450 mm 17.717 in	0.01 to 1.5 m 0.033 to 4.921 ft			
sing	U-LG	1 m 3.281 ft	1 m 3.281 ft	600 mm 23.622 in	0.01 to 2 m 0.033 to 6.562 ft			
Sen	HYPR	1 m 3.281 ft	1 m 3.281 ft	750 mm 29.528 in	0.01 to 2.5 m 0.033 to 8.202 ft			
Spot size		Approx. ø5 mm ø0.197 in or less (at a distance from the emitter of 1 m 3.281 ft)	Approx. ø5 mm ø0.197 in or less (at a distance from the emitter of 1 m 3.281 ft)	Approx. ø2 mm ø0.079 in or less (at a distance from the sensor head of 300 mm 11.811 in	Approx. ø6 mm ø0.236 in or less (at a distance from the sensor head of 1 m 3.281 ft)			
Sen	sing object	Opaque, translucent, or transparent object (Note 5)						
Operation indicator		Orange LED (lights up when the amplifier output is ON)						
	Protection	IP40 (IEC)	IP67 (IEC)	IP40 (IEC)	IP40 (IEC)			
nce	Ambient temperature	-10 to +55 °C +14 to +131 °F (No dew condensation or icing allowed), Storage: -20 to +70 °C -4 to +158 °F						
sistaı	Ambient humidity		35 to 85 % RH, Storage: 35 to 85 % RH					
a E	Ambient illuminance		Incandescent light: 3,000 &	£x at the light-receiving face				
Environmental resistance	Voltage resistance	1,000 V AC for one min. between all supply terminals connected together and enclosure						
ironr	Insulation resistance	20 $M\Omega$, or more, with 250 V DC megger between all supply terminals connected together and enclosure						
Env	Vibration resistance	10 to 500 Hz frequency, 1.5 mm 0.059 in double amplitude in X, Y and Z directions for two hours each						
	Shock resistance	100 m/s² acceleration (10 G approx.) in X, Y and Z directions three times each						
ent	Туре	Red semiconductor laser diode						
elen	Peak emission wavelength		660 nm	0.026 mil				
Emitting element	Laser class		Class 1 (IEC / FI	DA / JIS) (Note 6)				
Emi	Max. output	2 mW	2 mW	2 mW	1 mW			
Material		Enclosure: Stainless steel (SUS303) Enclosure: PBT Cover: Polycarbonate Cover: Acrylic		Enclosure: PBT, Indicator cover: Polycarbonate Beam-emitting / receiving surfaces: Glass				
Cable		0.09 mm ² 2-core shielded cab	ele, 2 m 6.562 ft long (Note 7)	0.15 mm², 2-core two parallel shielded cables, 2 m 6.562 ft long (Note 7				
Weight		Net weight: 50 g approx. Gross weight: 75 g approx.	Net weight: 50 g approx. Gross weight: 70 g approx.	Net weight: 50 g approx. Gross weight: 80 g approx.	Net weight: 50 g approx. Gross weight: 85 g approx.			
Acce	essories	M6 screw: 4 pcs. Toothed lock washer: 2 pcs.	MS-EXL2-2 (Mounting plate): 2 pcs.	MS-LS-1 (Mounting bracket): 1pc.	MS-LS-1 (Mounting bracket): 1pc. RF-330 (Refrector): 1pc.			

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C +73.4 °F.

- 2) When using the thru-beam type LS-H101 or LS-H102 or, do not set the receiving light sensitivity (gctL) of the applicable LS-500 series amplifier to level 2 or less. This is because there is a possibility of sensing becoming unstable.
- 3) The sensing range of the coaxial reflective type sensor is specified for white non-glossy paper (100 × 100 mm 3.937 × 3.937 in) as the object.

 4) The sensing ranges for coaxial refrective type sensors are values for the **RF-330** reflector. In addition, the sensing range is the possible setting range for the reflector. The sensor can detect an object less than 0.01 m 0.03 ft away. Note that if there are white papers or specular objects near the sensor head, reflected light from these objects may be received. In such cases, use the amplifier unit's receiving sensitivity function to lower the sensitivity, change the response time, or move the sensor head away from the target object. The incident light intensity may vary with the condition of the reflector surface. When using one of the applicable **LS-500** series amplifiers, leave an adequate safety margin when setting the threshold.

- 5) Make sure to confirm detection with an actual sensor before use.
- 6) This product complies with 21 CFR 1040.10 and 1040.11 Laser Notice No. 50, dated June 24, 2007, issued by CDRH (Center for Devices and Radiological Health) under the FDA (Food and Drug Administration).
- 7) Cable cannot be extended.

■ SPECIFICATIONS

Amplifiers

	_	Туре	Connector type	Cable type				
	S.	NPN output	LS-501	LS-501-C2				
Item	Model No.	PNP output	LS-501P	LS-501P-C2				
Supply v		· · · · · · · · · · · · · · · · · · ·	12 to 24 V DC ⁺¹⁰ ₋₁₅ % R					
Power consumption		tion	Normal operation: 1,200 mW or less (Current consumption 50 mA or le ECO mode: 980 mW or less (Current consumption 40 mA or less at 24	ss at 24 V supply voltage, Cable type: excluding monitor current output				
Sensing outputs (Sensing output 1, 2) (Note 4)			<npn output="" type=""> NPN open-collector transistor • Maximum sink current: 50 mA (Note 2) • Applied voltage: 30 V DC or less (between output and 0 V) • Residual voltage: 2 V or less (at max. sink current) < PNP output type> • Maximum source current: 50 mA (Note 2) • Applied voltage: 30 V DC or less (between output and +V • Residual voltage: 2 V or less (at max. source current)</npn>					
	Outp	out operation	Selectable either Light-ON or Dark-ON					
	Short	-circuit protection	Incorporated					
Sensing	Sens	sing output 1	Normal mode, differential mode, hysteresis r	mode, window comparator mode, selectable				
output setting	Sens (Not	sing output 2 e 4)	Normal mode, differential mode, hysteresis mode, self-diagnostic output mode, selectable	Normal mode, differential mode, hysteresis mode, self-diagnostic output mode, answer-back output mode, selectable				
Respons	se time		H-SP: 60 µs or less, FAST: 150 µs or less, STD: 250 µs or less, LONG	:: 500 µs or less, U-LG: 5 ms or less, HYPR: 24 ms or less , selectable				
Monitor (current (output		Output current: Approx. 4 to 20 mA (H-SP, FAST, STD: at 0 to 4,000 indication Response time: 2 ms or less Zero point: 4 mA \pm 1 % F.S. Span: 16 mA \pm 5 % F.S. Linearity: \pm 3 % F.S. Load resistance: 0 to 250 Ω				
External input (Note 4)		lote 4)	<npn output="" type=""> NPN non-contact input Signal condition High: +8 V to +V DC or open, Low: 0 to +2 V DC (source current 0.5 mA or less) Input impedance: $10 \text{ k}\Omega$ approx. </npn>	<pnp output="" type=""> PNP non-contact input Signal condition High: +4 V to +V DC (sink current 3.0 mA or less Low: 0 to +0.6 V DC or open Input impedance: 10 kΩ approx. </pnp>				
External	input fu	nction	Laser emission halt / teaching (full-auto teaching, limit teaching, 2 point teaching) / logic operation setting / copy lock / display adjustment / data bank load / data bank save, selectable					
Sensing o	output op	eration indicator	Orange LED (lights up when sensing output 1 or sensing output 2 is ON)					
Laser en	nission i	ndicator	Green LED (lights up during laser emission)					
Output s	elect in	dicator	Yellow LED (lights up when output is selected)					
Digital di			8-digit 7-segment digital display (4-digit green LED + 4-digit					
_		ication range	H-SP / FAST / STD: 0 to 4,000, LONG / U-LG / HYPR: 0 to 9,999					
Sensitivit Logical o			2-point teaching / limit teaching / full auto teaching / manual adjustment Between sensing output 1 and calculation target: Disabled / AND / OR / XOR, selectable Calculation target: Sensing output 2 / adjacent upstream amplifier (sensing output 1) / external input, selectable					
Timer functions Timer period								
		er period	Timer range "ms": 0.5 ms approx., 1 to 9,999 ms approx., in approx. 1 ms intervals Timer range "sec": 0.5 sec. approx., 1 to 32 sec. approx., in approx. 1 sec. intervals Timer range "1/10 ms": 0.05 ms approx., 0.1 to 999.9 ms approx., in approx. 0.1 ms intervals, Set separately for each output.					
Interferer	nce prev	vention function	Incorporate	ed (Note 3)				
Pro	otection		IP40 (IEC)					
resistance mloving mA mloving mA mloving maximal maxim	nbient te	mperature	-10 to +55°C +14 to +131 °F (If 4 to 7 units are mounted close together are mounted close together, -10 to +45 °C +14 to +113°F) (No dew continuous conti	r, -10 to +50°C +14 to +122 °F; if 8 to 16 units (cable type: 8 to 12 units ndensation or icing allowed), Storage: -20 to +70 °C -4 to +158 °F				
E S Am	nbient hu	umidity	35 to 85 % RH, Storage: 35 to 85 % RH					
Sist Volt	Itage with	nstandability	1,000 V AC for one min. between all supply	en all supply terminals connected together and enclosure				
⊔ ^ը Ins	ulation	esistance	$20\ M\Omega$, or more, with $250\ V$ DC megger between all supply terminals connected together and enclosure					
Vib	Vibration resistance		10 to 150 Hz frequency, 0.75 mm 0.030 in (max. 10 G) double amplitude in X, Y and Z directions for two hours each					
Sho	Shock resistance		98 m/s² acceleration (10 G approx.) in X, Y and Z directions five times each					
Material			Enclosure: Polycarbonate, Cover:	Polycarbonate, Switch: Polyacetal				
Cable								
Cable ex	xtension		Extension up to total 100 m 328.084 ft is					
Weight			Net weight: 15 g approx., Gross weight: 55 g approx.	Net weight: 75 g approx., Gross weight: 110 g approx.				
Accesso	ory		FX-MB1 (Amplifier p	protective seal): 1 set				

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C +73.4 °F.

2) 25 mA if 5 or more amplifier are connected in cascade (excluding cable extension).

3) Number of units that can be mounted close together: 0 for H-SP; 2 for FAST; 4 for STD, LONG, U-LG, or HYPR

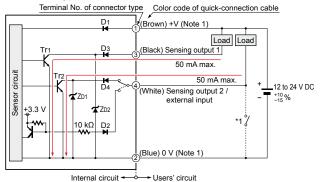
4) Select either sensing output 2 or external input as the connector type.

■ I/O CIRCUIT AND WIRING DIAGRAMS

I/O circuit diagram

NPN output type

Connector type

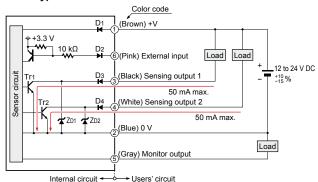


- Notes: 1) The quick-connection sub cable does not have +V (brown) and 0 V (blue).

 The power is supplied from the connector of the main cable.
 - The power is supplied from the connector of the main cable. 2) Wiring when sensing output 2 is selected is shown with solid lines. Wiring when external input is selected is shown with broken lines.

Symbols ... D_1 , D_2 , D_3 , D_4 : Reverse supply polarity protection diode Z_{D_1} , Z_{D_2} : Surge absorption zener diode Tr_1 , Tr_2 : NPN output transistor

Cable type



Non-voltage contact or NPN open-collector transistor

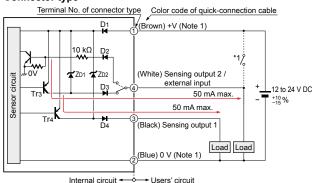
• External input



- High: +8 V to +V, or open Low: 0 to +2 V (source current: 0.5 mA or less)
- Light emission halts and teaching occurs
 when at I ow

PNP output type

Connector type

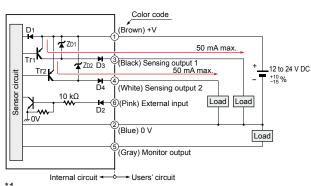


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Symbols ... D_1 , D_2 , D_3 , D_4 : Reverse supply polarity protection diode Z_{D1} , Z_{D2} : Surge absorption zener diode Tr_1 , Tr_2 : PNP output transistor

Cable type



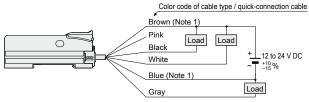
Non-voltage contact or PNP open-collector transistor



- External input High: +4 V to +V (sink current: 3 mA or less)
- Low: 0 to +0.6 V, or open
 Light emission halts and teaching occurs when at High.

Wiring diagram

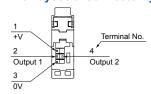
NPN output type



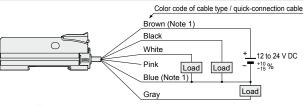
Notes: 1) The quick-connection sub cable does not have brown lead wire and blue lead wire. The power is supplied from the connector of the main cable.

2) The quick-connection cable does not have gray or pink lead wires.

Terminal layout of connector type



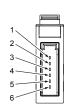
PNP output type



Notes: 1) The quick-connection sub cable does not have brown lead wire and blue lead wire. The power is supplied from the connector of the main cable.

2) The quick-connection cable does not have gray or pink lead wires.

* Connector for amplifier (CN-EP4) pin position



Terminal No.	Connection cable	
1	Purple	
2	White	
3	Shield	
4	Shield	
(5)	Black	
6	Pink	

■ PRECAUTIONS FOR PROPER USE

· This catalog is a guide to select a suitable product. Be sure to read the instruction manual attached to the product prior to its use.



- · Never use this product as a sensing device for personnel protection
- In case of using sensing devices for personnel protection, use products which meet regulations and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

Cautions for laser beams

• These products are Class 1 laser in compliance with IEC, JIS and FDA regulations*. To reduce the risk of danger, do not look directly at the laser beam or view it through an optical system.



• A label with instructions as found at the below is affixed to the product. Handle this sensor as per the instruction on the labels.



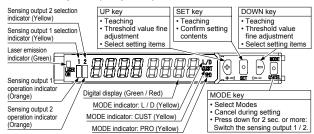


Certification and identification label

Warning label

- This product complies with 21 CFR 1040.10 and 1040.11 Laser Notice No. 50, dated June 24, 2007, issued by CDRH (Center for Devices and Radiological Health) under the FDA (Food and
- The safety standard IEC 60825-1-2007 specifies the use of laser beam products. Please read it carefully before using the laser beam sensor.

Part description (Amplifier)



Mounting

Amplifier

<How to mount the amplifier>

- (1) Fit the rear part of the mounting section of the amplifier on a 35 mm 1.378 in width DIN rail.
- (2) Press down the rear part of the mounting section of the unit on the 35 mm 1 378 in width DIN rail and fit the front part of the mounting section to the DIN rail.



<How to remove the amplifier>

- (1) Push the amplifier forward.
- (2) Lift up the front part of the amplifier to remove it.

Note: Be careful. If the front part is lifted without pushing the amplifier forward, the hook on the rear portion of the mounting section is likely to break

<How to mount the sensor head>

- (1) Insert the sensor head connector into the inlet until it clicks.
- (2) Fit the cover to the connector

Connector Sensor head side connector

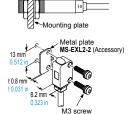
Sensor head

LS-H101_□

 The tightening torque should be 0.98 N·m or less.

LS-H102□

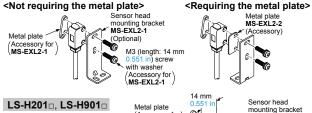
- · In case mounting this product, use a metal plate MS-EXL2-2 (accessory).
- The tightening torque should be 0.5 N·m or less with M3 screws.



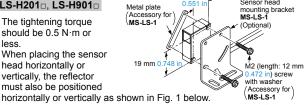
(Purchase separately)

Attached toothed lock washer

 In case using the dedicated sensor head mounting bracket MS-EXL2-1 (optional) when mounting this product, the metal plate MS-EXL2-2 (accessory) is required depending on the mounting direction. Mount as the diagram below indicates



- · The tightening torque should be 0.5 N·m or
- · When placing the sensor head horizontally or vertically, the reflector must also be positioned



If the sensor head is placed horizontally or vertically but the reflector is tilted as shown in Fig. 2 below, the reflection amount will decrease, which may cause unstable detection.

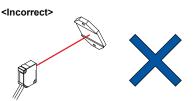
Fig. 1 Proper positioning

When placing the sensor head horizontally or vertically, the reflector shall also be positioned horizontally or vertically.

<Correct>

Fig. 2 Improper positioning

When placing the reflector tilted even when the sensor head is positioned horizontally or vertically.



Wiring

- · Make sure that the power supply is off while wiring.
- · Verify that the supply voltage variation is within the rating.
- · Take care that if a voltage exceeding the rated range is applied, or if an AC power supply is directly connected, the sensor may get burnt or damaged.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.
- · In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this product, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- · Take care that short-circuit or wrong wiring of the load may burn or damage the sensor.
- Do not run the wires together with high-voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction
- · Ensure that an isolation transformer is utilized for the DC power supply. If an auto transformer is utilized, the main amplifier or power supply may be damaged.
- Make sure to use the optional quick-connection cable for the connection of the amplifier [connector type LS-501(P)]. Extension up to total 100 m 328.084 ft is possible with 0.3 mm², or more, cable However, in order to reduce noise, make the wiring as short as possible. Set the supply voltage after considering the voltage drop caused by the cable's resistance.

When adding units, wiring length must not exceed 50 m 164.042 ft (for 5 to 8 amplifiers) or 20 m 65.617 ft (for 9 to 16 amplifiers).

■ PRECAUTIONS FOR PROPER USE

Others

LS-H101_□

- Do not use during the initial transient time (0.5 sec. approx.) after the power supply is switched on.
- Because the sensitivity is higher in U-LG and HYPER modes than in other modes, it can be more easily affected by extraneous noise. Check the operating environment before use.

Sensor head

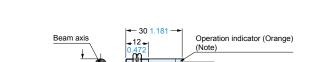
Sensor head

• This sensor is suitable for indoor use only.

- · Avoid dust, dirt, and steam.
- Take care that the product does not come in direct contact with water, oil, grease, or organic solvents, such as, thinner, etc.
- This sensor cannot be used in an environment containing inflammable or explosive gasses.
- · Never disassemble or modify the sensor.

■ DIMENSIONS (Unit: mm in)

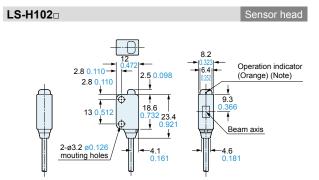
The CAD data can be downloaded from our website.



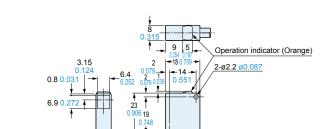
M6 × 0.75 0.030

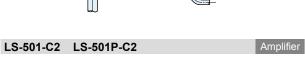
Note: Not incorporated on the emitter.

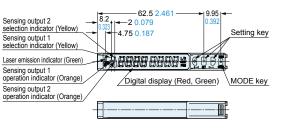
LS-H201 LS-H901

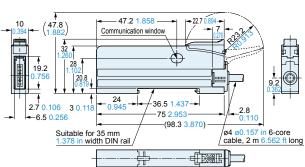


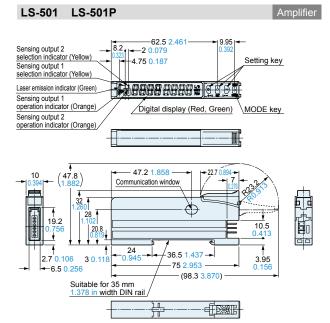
Note: Not incorporated on the emitter.



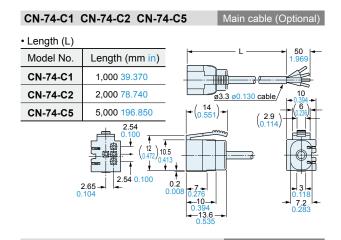


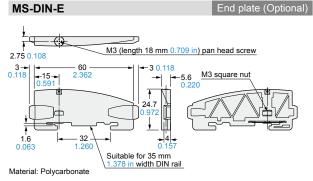


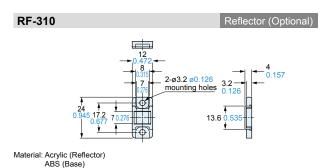


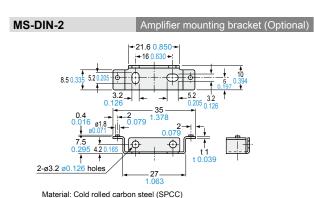


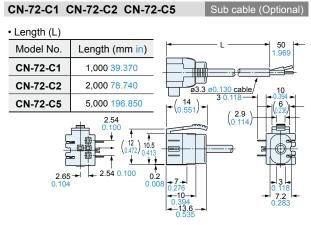
■ DIMENSIONS (Unit: mm in)

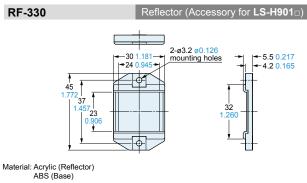


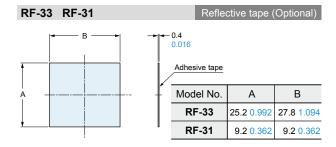






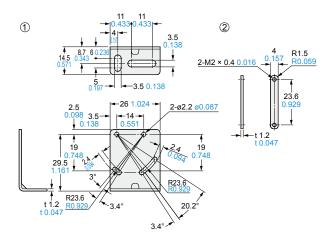






■ DIMENSIONS (Unit: mm in)

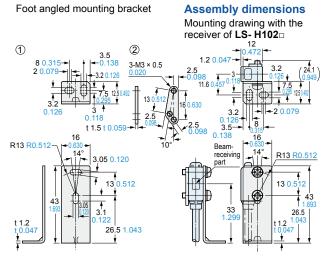
MS-LS-1 Sensor head mounting bracket (Accessory for LS-H201 , LS-H901)



Material: Stainless steel (SUS304) Two M2 (length 12 mm $0.472 \, \text{in}$) screws with washers [stainless steel (SUS)] are attached.

MS-EXL2-1 Sensor head mounting bracket for LS-H102 ☐ (Optional)

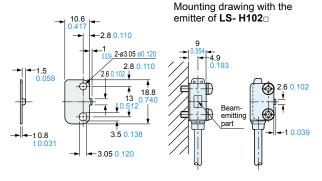
The CAD data can be downloaded from our website.



Material: Stainless steel (SUS304) Two M3 (length 14 mm 0.551 in) screws with washers [stainless steel (SUS)] are attached.

MS-EXL2-2 Mounting plate (Accessory for **LS-H102**□)

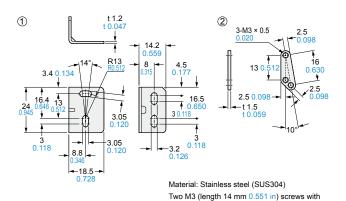
Assembly dimensions



Material: Stainless steel (SUS304) Note: Without using the mounting plate, beam misalignment may occur. Note: Screws are not attached. Purchase separately.

MS-EXL2-5 Sensor head mounting bracket for LS-H102 (Optional)

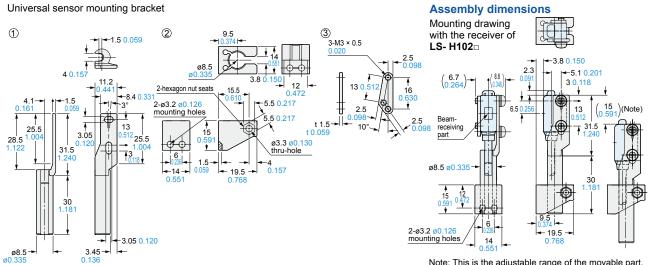
Rear mounting bracket



MS-EXL2-4

Sensor head mounting bracket for **LS-H102**□ (Optional)

washers [stainless steel (SUS)] are attached.



Material: Die-cast zinc alloy

Two M3 (length 14 mm 0.551 in) screws with washers [stainless steel (SUS)], one M3 (length 10 mm 0.394 in) hexagon-socket-head bolt [stainless steel (SUS)], and one M3 hexagon nut [stainless steel (SUS)] are attached.

Note: This is the adjustable range of the movable part.

Related Products

Digital Fiber Sensor

FX-500 SERIES Ver.2

At the industry's leading edge

Featuring superior stability and sharpness



Standard type
FX-501 (P)
Two-output type
FX-502 (P)
Cable type
FX-505 (P)-C2



■ Reduced individual differences

Thanks to increased stability of the incident light intensity, units will indicate similar readings, even if the amplifier is replaced.

Sharp detection

In addition to these sensors' low hysteresis, their hyper beam feature boosts the sensing range.

■ Flat display with a wide field of view
The high-brightness, 7-segment display can be seen clearly, even from an angle.

Communication Unit for Open Network

SC-GU3 SERIES



Link digital sensors directly to open networks

3 advantages of the SC-GU3 series

CC-Link compatible type **SC-GU3-01**

DeviceNet compatible type **SC-GU3-02**

EtherCAT compatible type **SC-GU3-03**

Typical compatible models:

Fiber sensor
Laser sensor
Pressure sensor

FX-500 series
LS-501, LS-403
PPS-400 series

DPS-400 series

■ High reliability

Monitoring of equipment can be done via network, so that actions can be taken correctly and swiftly.

■ Helpful for efficient maintenance work The memory function is useful when replacing

■ Simple wiring and space-saving

Using connectors makes cascade connection simple and eliminates additional work.

Amplifier Built-in Ultra Compact Laser Sensor

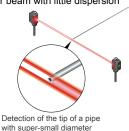
EX-L200 SERIES

Ultra-compact type

Thanks to a dedicated custom IC and a new design, the **EX-L200** is more than 50% smaller by volume than a general-purpose photoelectric sensor.

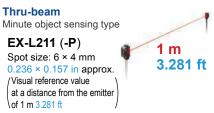


Laser beam with little dispersion



Built-in amplifier at this size?

Introducing ultra-compact amplifier built-in laser sensor



Thru-beam

Long-range sensing type

EX-L212 (-P)
Spot size: 8 × 5.5 mm
0.315 × 0.217 in approx.

Visual reference value
at a distance from the emitter

Retroreflective

\of 1 m 3.281 ft

Long-range sensing type

EX-L291 (-P)

Spot size: 6 × 4 mm 0.236 × 0.157 in approx. Visual reference value at a distance from the sensor of 1 m 3.281 ft

at a distance from th of 300 mm 11.811 in

Spot type **EX-L261 (-P)**

3 m

4 m

The value for

RF-330 reflector

13.123 ft

9.843 ft

Spot diameter: ø1 mm ø0.039 in or less Visual reference value at a distance from the sensor of 50 mm 1.969 in

Convergent reflective

Convergent reflective Line spot type

EX-L262 (-P) Spot size: 1 × 5 mm

0.039 × 0.197 in approx. Visual reference value at a distance from the sensor of 50 mm 1.969 in

Spot reflective

Minute object detection type

EX-L221 (-P)

Spot diameter: ø1 mm ø0.039 in or less /Visual reference value at a distance from the sensor





20 to 50 mm 0.787 to 1.969 in (Center: 22 mm 0.866 in)

Value for white non-glossy paper (100 mm 3.937 in square)



20 to 70 mm 0.787 to 2.756 in (Center: 22 mm 0.866 in)

Value for white non-glossy paper (100 mm 3.937 in square)

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