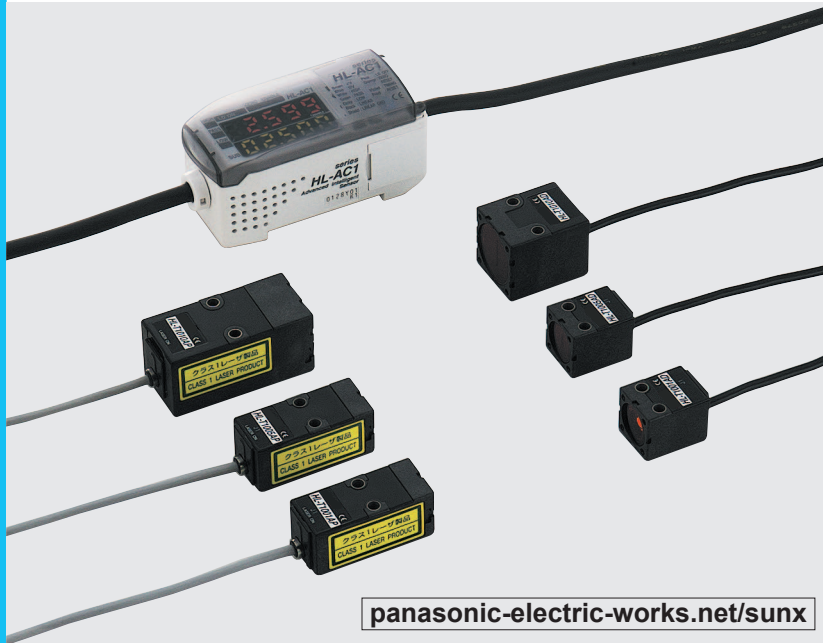


HL-T1 SERIES

- FIBER SENSORS
- LASER SENSORS
- PHOTOELECTRIC SENSORS
- MICRO PHOTOELECTRIC SENSORS
- AREA SENSORS
- LIGHT CURTAINS
- PRESSURE / FLOW SENSORS
- INDUCTIVE PROXIMITY SENSORS
- PARTICULAR USE SENSORS
- SENSOR OPTIONS
- SIMPLE WIRE-SAVING UNITS
- WIRE-SAVING SYSTEMS
- MEASUREMENT SENSORS
- STATIC CONTROL DEVICES
- ENDOSCOPE
- LASER MARKERS
- PLC / TERMINALS
- HUMAN MACHINE INTERFACES
- ENERGY CONSUMPTION VISUALIZATION COMPONENTS
- FA COMPONENTS
- MACHINE VISION SYSTEMS
- UV CURING SYSTEMS
- Selection Guide
- Laser Displacement
- Magnetic Displacement
- Collimated Beam
- Digital Panel Controller
- Metal-sheet Double-feed Detection
- HL-T1**
- LA
- LD


Related Information

- General terms and conditions..... F-17
- Sensor selection guide..... P.963~
- Glossary of terms / General precautions P.1397 / P.1405
- About laser beam P.1403~



panasonic-electric-works.net/sunx

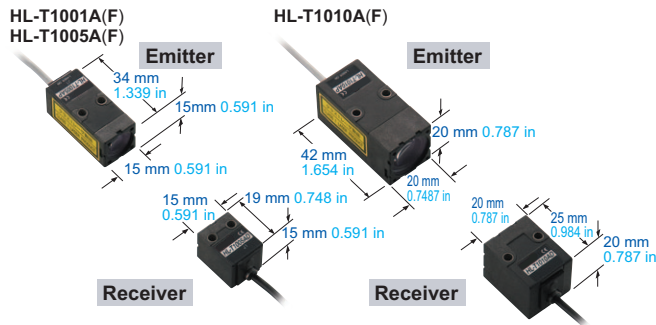


 This product is classified as a Class 1 Laser Product in IEC / JIS standards and a Class II Laser Product in FDA regulations 21 CFR 1040.10. Do not look at the laser beam through optical system such as a lens.

Ultra-compact sensor head A high-functionality intelligent controller

Ultra-compact sensor head

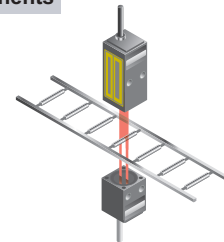
The ultra-compact size and yet the high level of performance. These sensors save space.



Resolution of 4 μm 0.157 mil

A high resolution of 4 μm 0.157 mil (at an average 64 cycles) allows high-precision positioning and size judgment.

Distinguishing size of electronic components



BASIC PERFORMANCE

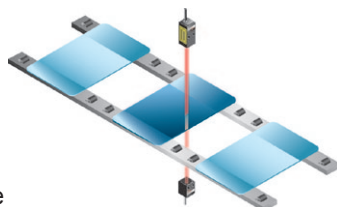
Long sensing range

Long sensing range of 500 mm 19.685 in [HL-T1005A(F), HL-T1010A(F)] and 2 m 6.562 ft [HL-T1001A(F)] are available.

High-precision judgment even from minute differences in light intensity

The sensors are sensitive to minute differences in light intensity, so that they can judge even the opacity of glass and turbidity of liquids. In addition, the amount of light received can be displayed as a percentage to allow you to determine permeation rates.

Distinguishing opacity of glass



Minimum sensing object diameter ø8 μm ø0.315 mil

HL-T1001A(F)

The laser with a beam diameter of ø1 mm ø0.039 in can sense extremely small objects with dimensions in micrometers such as bonding wires.

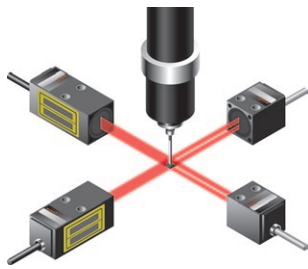


Adoption of a Class 1 laser

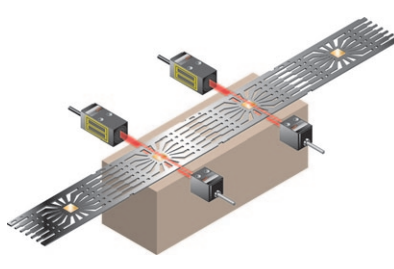
The adoption of a Class 1 laser (IEC / JIS) eliminates the need for safety countermeasures, so that these sensors can be used in photoelectric sensor applications with confidence.

APPLICATIONS

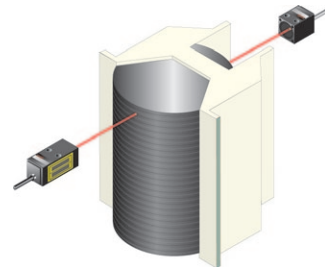
Checking the positioning of chip components



Detecting defective lead frame seating



Sensing wafer position in wafer cassette

**FUNCTIONS****Fully equipped with convenient functionality**

A wide range of convenient features has been incorporated into the unit's compact body: standard received light setting / auto scaling setting / measurement processing (various timer and hold functions) / differentiation / monitor focus function. These features make the unit useful for a wide variety of applications.

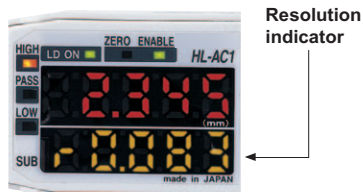
3 types of teaching functions are now available

3 types of teaching functions are available: positioning teaching / 2-point teaching / automatic teaching, thus enabling a variety of applications to be accommodated for many different types of production sites.

Positioning teaching	The actual value measured at the time when teaching is performed is utilized as the threshold value. Best suited for high-precision positioning.
2-point teaching	In this teaching method, an intermediate level between the first and the second teaching levels is utilized as the threshold value. Minute differences, such as changes as small as the thickness of a sheet of paper between the sensing objects, can be detected when this teaching method is utilized.
Automatic teaching	With this teaching method, a series of periodic arbitrary measurements are taken automatically and an intermediate value, between the maximum and minimum values obtained by this measurement, is utilized as the threshold value. The threshold value is therefore set in relation to the sensing object. Best suited for applications in which teaching must be performed without stopping the current flow of operations.

Detection resolution can be easily confirmed

The current resolution can be easily confirmed by setting the controller to indicate resolution display mode. By displaying the resolution, the marginal increment can be easily determined for the threshold value setting, helping to accurately determine whether sensing can be performed.

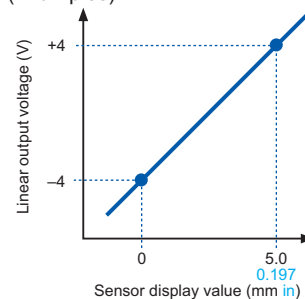
**Analog output is switchable between current / voltage**

The analog output can be switched between either of two different outputs; current (4 to 20 mA) / voltage (± 4 V). With the monitor focus function, the output can be adjusted over the range from -5 V to $+5$ V, or from 0 V to $+5$ V, facilitating connectivity with a variety of output devices.

Monitor focus function

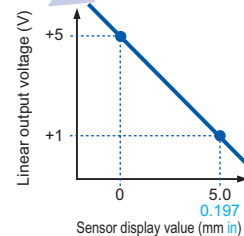
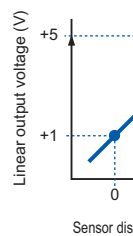
The linear output is fully adjustable over the following range (current: 4 to 20 mA / voltage: ± 4 V). The usage of the monitor focus function together with selectable current / voltage switching for the linear output allows for compatibility with a variety of output devices.

(Examples)



In the event that
5 mm 0.197 in: +5 V
0 mm 0 in: +1 V

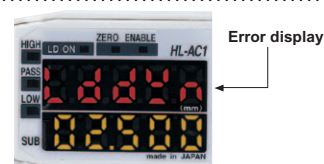
In the event that
5 mm 0.197 in: +1 V
0 mm 0 in: +5 V



The linear output must be set by determining output values (maximum; current: 0 to 23.5 mA / voltage: ± 5.5 V) at two different points, for the arbitrary display value.

MAINTENANCE**Self-check for laser diode deterioration**

The intelligent controller performs self-checking for laser diode deterioration. If the controller detects significant deterioration (end of diode life), an error will be displayed on the main digital display panel. This function enables users to prepare in advance for potential laser diode malfunctions.

FIBER
SENSORSLASER
SENSORSPHOTOELECTRIC
SENSORSMICRO
PHOTOELECTRIC
SENSORSAREA
SENSORSLIGHT
CURTAINSPRESSURE /
FLOW
SENSORSINDUCTIVE
PROXIMITY
SENSORSPARTICULAR
USE SENSORSSENSOR
OPTIONSSIMPLE
WIRE-SAVING
UNITSWIRE-SAVING
SYSTEMSMEASUREMENT
USE SENSORSSTATIC CONTROL
DEVICES

ENDOSCOPE

LASER
MARKERSPLC /
TERMINALSHUMAN MACHINE
INTERFACESENERGY CONSUMPTION
VISUALIZATION
COMPONENTS

FA COMPONENTS

MACHINE VISION
SYSTEMSUV CURING
SYSTEMSSelection
GuideLaser
DisplacementMagnetic
DisplacementCollimated
BeamDigital Panel
ControllerMetal-sheet
Double-feed Detection**HL-T1****LA****LD**

- FIBER SENSORS
- LASER SENSORS
- PHOTO-ELECTRIC SENSORS
- MICRO PHOTO-ELECTRIC SENSORS
- AREA SENSORS
- LIGHT CURTAINS
- PRESSURE / FLOW SENSORS
- INDUCTIVE PROXIMITY SENSORS
- PARTICULAR USE SENSORS
- SENSOR OPTIONS
- SIMPLE WIRE-SAVING UNITS
- WIRE-SAVING SYSTEMS
- MEASURE-NEXT SENSORS
- STATIC CONTROL DEVICES
- ENDOSCOPE
- LASER MARKERS
- PLC / TERMINALS
- HUMAN MACHINE INTERFACES
- ENERGY CONSUMPTION VISUALIZATION COMPONENTS
- FA COMPONENTS
- MACHINE VISION SYSTEMS
- UV CURING SYSTEMS
- Selection Guide
- Laser Displacement
- Magnetic Displacement
- Collimated Beam
- Digital Panel Controller
- Metal-sheet Double-feed Detection

OPERABILITY

Superior operability has been achieved

All settings can be easily performed by using the four-way keys and viewing the digital displays.

Large dual digital display

After power up, the measured value (red) and the threshold value (yellow) are displayed (letter height 7 mm 0.276 in)

Judgment output indicators

HIGH (Orange) / PASS (Green) / LOW (Yellow) 3-color display



Easy operation with four-way keys

OPTIONS

Calculations for 2 sensors are possible

The calculation unit (optional) just needs to be connected between the two controllers to enable calculations (addition and subtraction) to be carried out for two sensors. No digital panel controller is needed either.

Sheet width measurement



ORDER GUIDE

Sensor heads

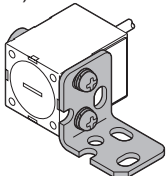
Type	Appearance	Sensing range	Sensing width	Min. sensing object	Conforming standards / regulations	Model No.
Beam diameter $\phi 1$ mm $\phi 0.039$ in type		2 m 6.562 ft	$\phi 1$ to $\phi 2.5$ mm $\phi 0.039$ to $\phi 0.098$ in at 500 to 2,000 mm 19.685 to 78.740 in sensing range	$\phi 8 \mu\text{m}$ $\phi 0.315$ mil opaque object $\phi 50 \mu\text{m}$ $\phi 1.969$ mil opaque object at 500 to 2,000 mm 19.685 to 78.740 in sensing range	IEC / JIS	HL-T1001A
					FDA / IEC / JIS	HL-T1001F
Sensing width 5 mm 0.197 in type		500 mm 19.685 in	5 mm 0.197 in	$\phi 0.05$ mm $\phi 0.002$ in opaque object	IEC / JIS	HL-T1005A
					FDA / IEC / JIS	HL-T1005F
Sensing width 10 mm 0.394 in type		500 mm 19.685 in	10 mm 0.394 in	$\phi 0.1$ mm $\phi 0.004$ in opaque object	IEC / JIS	HL-T1010A
					FDA / IEC / JIS	HL-T1010F

Note: The model No. with "P" shown on the label affixed to the product is the emitter, "D" shown on the label is the receiver.
(e.g.) Emitter of HL-T1001A: HL-T1001AP, Receiver of HL-T1001A: HL-T1001AD

Accessories

• **MS-HLT1-1**

Sensor mounting bracket for HL-T1001A(F) / HL-T1005A(F)
(Note)

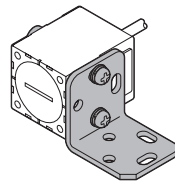


Two M3 (length 20 mm 0.787 in) screws with washers are attached.

Note: 2 sets are required to mount the emitter / receiver.

• **MS-LA3-1**

Sensor mounting bracket for HL-T1010A(F)
(Note)



Two M3 (length 25 mm 0.984 in) screws with washers are attached.

• **CN-HLT1-1**

(Sensor head to controller connection cable)

