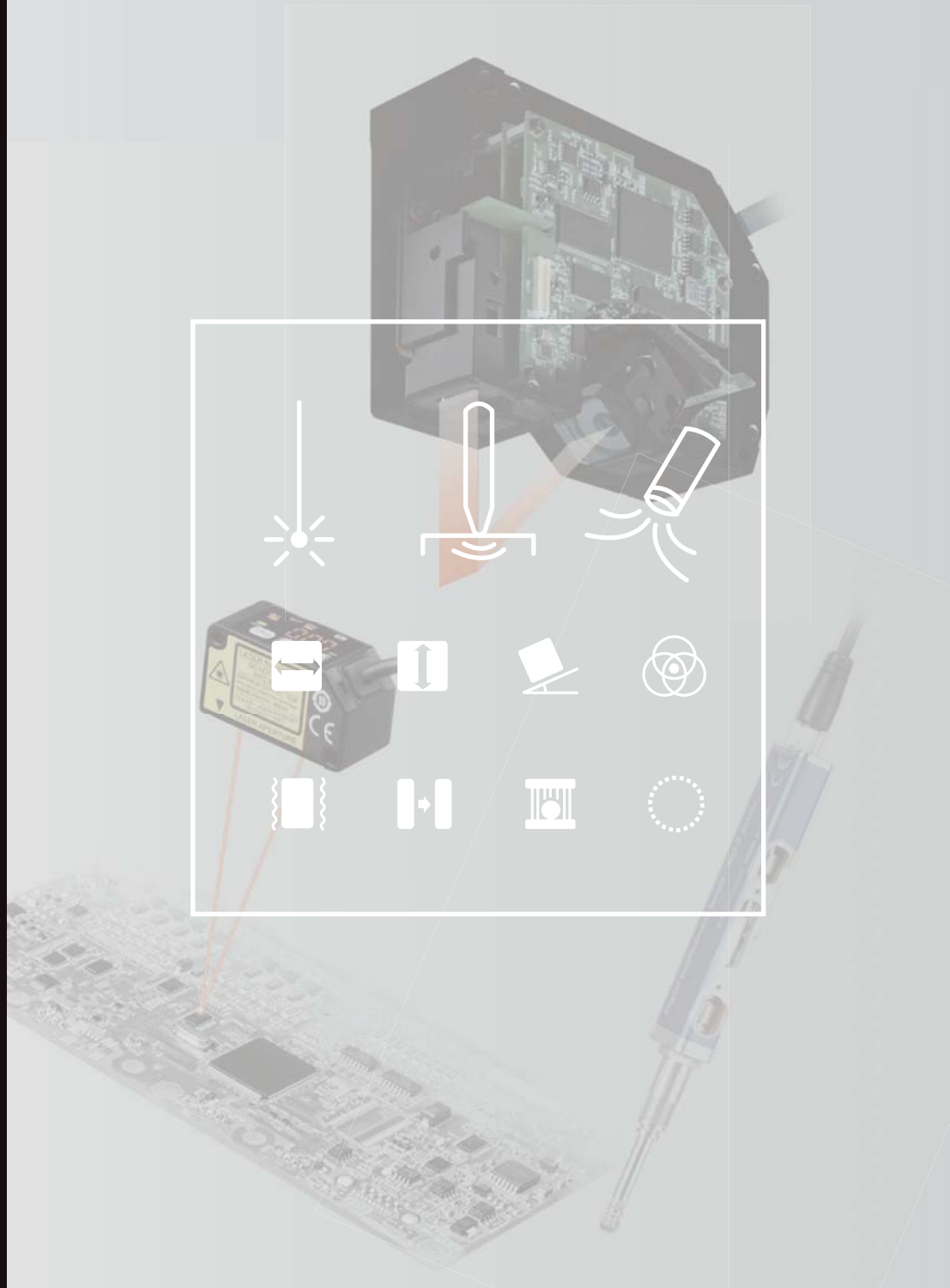
Panasonic

Overview

Measurement sensors

Laser displacement sensors
Contact type displacement sensors
Eddy current type displacement sensors



Panasonic Industrial Devices SUNX

Measurement sensors

Index

Measure sensor products

LASER

HL-C2
Ultra High-speed / High-precision Laser Displacement Sensor

LASER

HL-G1
Compact Laser Displacement Sensor

LASER

HG-C
Micro Laser Distance Sensor

Multi-Point LASER

HL-D3
High Speed, Multi-Point Laser Displacement Sensor

LASER

HL-T1
Ultra-compact Laser Collimated Beam Sensor

CONTACT

HG-S
Contact-Type Digital Displacement Sensor

EDDY CURRENT

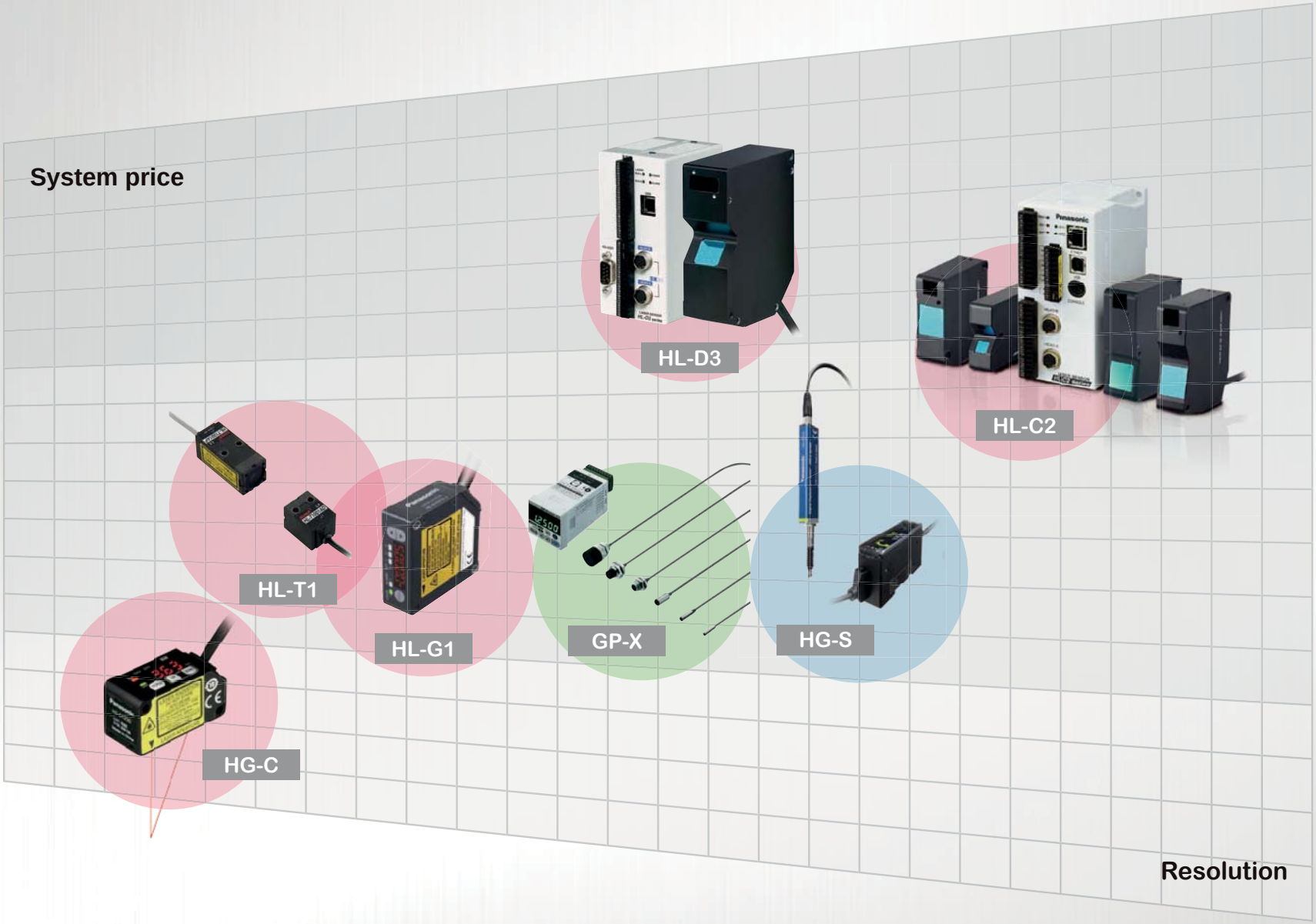
GP-X
High Speed / High Accuracy Eddy Current Type Digital Displacement Sensor

Specification

Series		Spot size	Resolution	Measurement range	Sampling rate	Features
	**HL-C2**	Small 20 to 400μm (Line spot type) 700 to 6,500μm	0.01 to 0.2μm	7.2 to 550mm	minimum 10μs	Ultra High-speed • High-precision Laser Displacement Sensor
	**HL-G1**	Small 100 to 3,500μm	0.5 to 20μm	24.3 to 400mm	minimum 200μs	Compact Laser Displacement Sensor
	**HG-C**	Small 50 to 500μm	Repeatability 10 to 800μm	25 to 600mm	fixed value 500μs	CMOS type Micro Laser Distance Sensor
	**HL-D3**	50μm × 15mm	1μm	40 to 60mm	minimum 80μs	High Speed, Multi-Point Laser Displacement Sensor
	**HL-T1**	-	Repeatability 4μm	-	-	Ultra-compact sensor head A high-functionality intelligent controller
	**HG-S**	Large	0.1 to 0.5μm	10mm	-	Slim & Robust Sensor Unit Introducing Contact-Type Digital Displacement Sensor Featuring optical absolute method in the slim and strong unit body
	**GP-X**	Large	0.32 to 20μm	0 to 10mm	fixed value 25μs	High Speed High Accuracy Eddy Current Type Digital Displacement Sensor

The resolution changes depend on setting of the sampling cycle and the response frequency. And the accuracy also related to the ambient temperature and lineality.
Please consult with our sales when selecting the measurement sensor products.

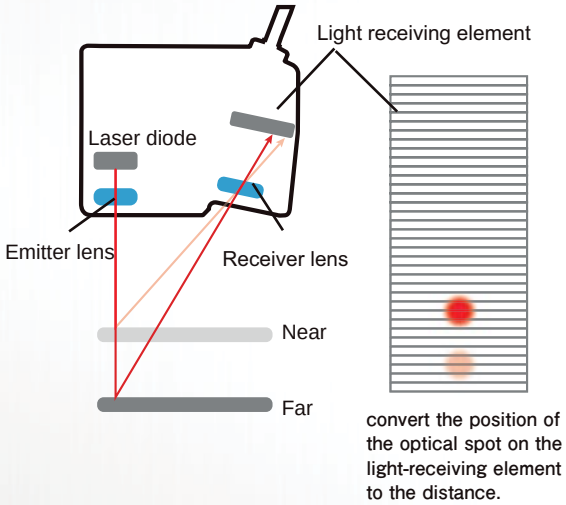
Product positioning



Principles

Laser
displacement sensors

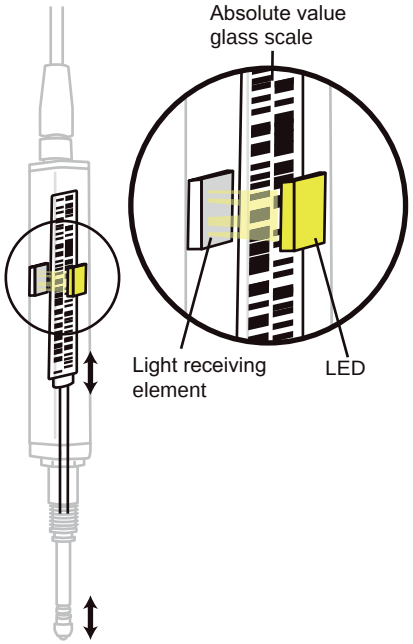
Measures the distance to the object,
by using the triangulation principal.
(Measures displacement or thickness)



- **Long sensing distance**
- **Measurement by small beam spot**
- **High speed measurement**
- **Multi-point type allow the profile measurement**
- **Measurement will be influenced by the environment**

Contact-Type
displacement sensors

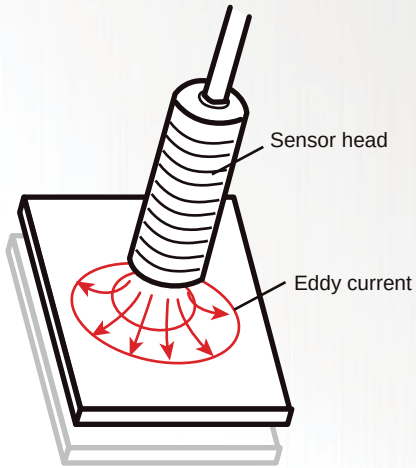
Measures the distance by contacting the object. As the sensor pushed in, the glass scale inside moves and displacement can be read distance from the glass slit.



- **High resolution**
- **Not affected by the surface condition**
- **No influence from the environmental condition**
- **The risk of causing damage by the contacting**
- **Longer tact time**

Eddy current type
displacement sensors

Measures the distance by using impedance change from electromagnetic induction.



- **No influence from the environmental condition**
- **Suitable for the high-speed moving application**
- **High resolution**
- **Contactless and no damage**
- **Short measurement distance**

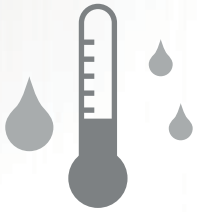
Choosing the right measurement sensor

For choosing your right measurement sensor, you need to consider several conditions.

Measurement object

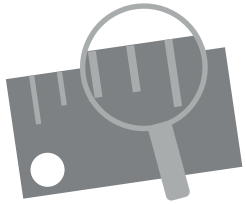
Choose the type of measurement according to material, size or surface state.

Ambient environment



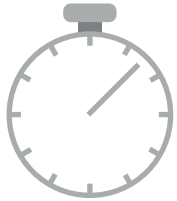
Choose the sensor considering the surrounding oil mist or temperature.

Precision



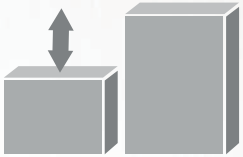
Choose the sensor by the required accuracy.

Cycle time

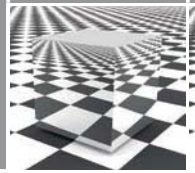
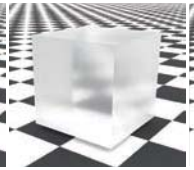
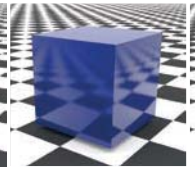
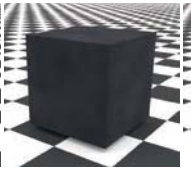
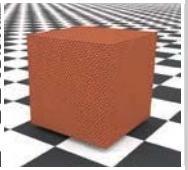


Choose the sensor by required tact time.

Range



Narrow sensor candidates by considering the distance from the object or required measurement range.

Series		Method	Metal		Plastic			Glass		Low refrective object	
			Metal (Mirror surface)	Metal (Hairline finished)	Plastics (Transparent)	Plastics (Half transparent)	Opaque plastics	Glass (Transparent)	Glass (Half transparent)	Black rubber	Soft body objects
											
	HL-C2	Distance (1 head)	3 Specular reflective	3 Diffuse reflective	3 Specular reflective	1*A Specular reflective	3 Diffuse reflective	2 Specular reflective	2 Diffuse reflective	2 Diffuse reflective	1 Diffuse reflective
		Thickness (2 heads)									
	HL-G1	Distance (1 head)	3 Specular reflective	3 Diffuse reflective	3 Specular reflective	1 Specular reflective	3 Diffuse reflective	2 Specular reflective	2 Diffuse reflective	2 Diffuse reflective	0 Diffuse reflective
		Thickness (2 heads)			0	0		0	0		
	HG-C	Distance (1 head)	1	3	0	1*A	3	0	2	2	0
		Thickness (2 heads)							0		
	HL-D3	Distance (1 head)	2*A	3	1*A	1	3	1*A	2	1	0
		Thickness (1 head)									
	HL-T1	Distance (1 head)	3	3	0	1	3	0	1	3	1
		Thickness (1 head)	1	1			1			1	
	HG-S	Distance (1 head)	3	3	3	3	3	2	3	1	0
		Thickness (2 heads)									
	GP-X	Distance (1 head)	3	3	0	0	0	0	0	0	0
		Thickness (2 heads)									

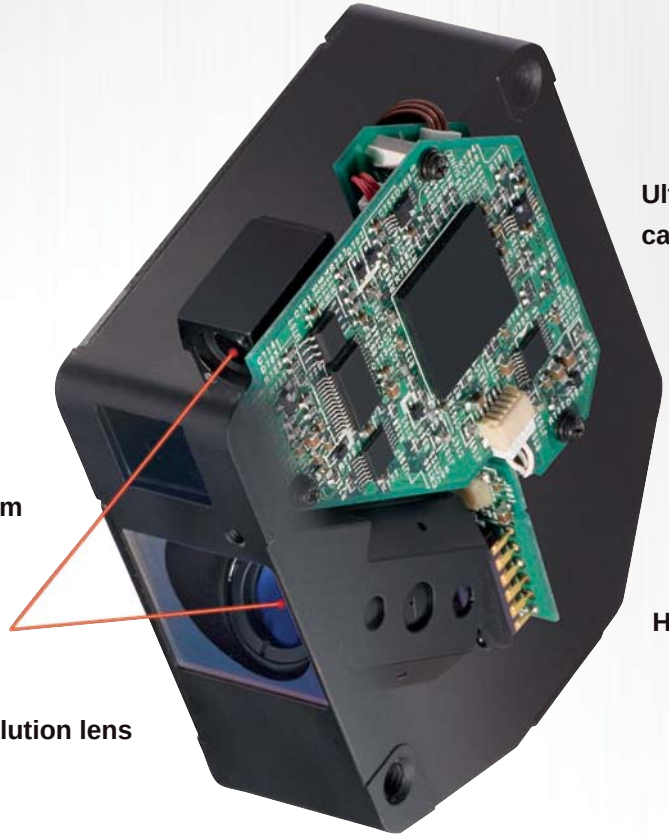
Impossible ← 0 1 2 3 → Possible

*A:For the glossy surface, measureable with Specular reflective

HL-C2

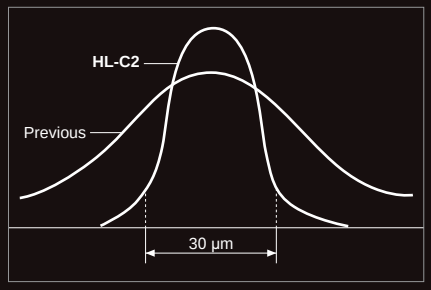
Ultra High-speed / High-precision
Laser Displacement Sensor

Sampling rate	Linearity	Resolution
100kHz	±0.02%	0.01μm



Micro Spot Gaussian Beam

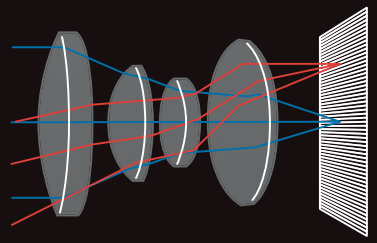
Exclusive optical equipment and diaphragm structure sustain laser beam of high quality at a radiant density that is close to ideal in the Gaussian distribution.



Image

High-resolution lens

The light-receiving part can create images at a minimum point from light received from a variety of different angles to produce images with even greater precision.



HDLC-CMOS sensors

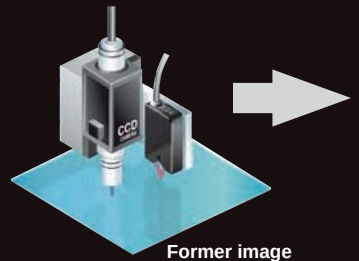
High density light-receiving cells and a processing speed which is close to maximum limits result in high resolutions and high speeds which exceed all expectations for laser displacement sensors.

Ultra high-speed calculation processor

All signals are digitalized by a high speed processor while achieving high precision and high speed with its exclusive algorithm.

Separate type

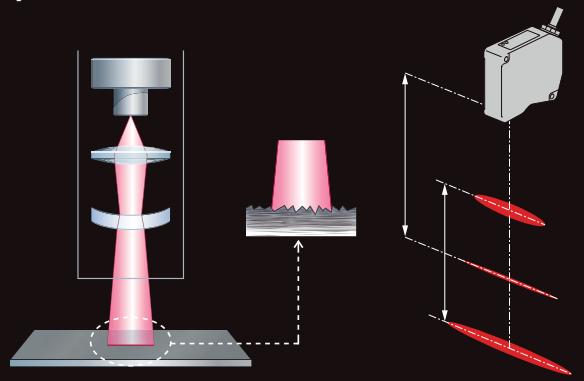
Realize the stable measurement by coaxially align the drop from nozzle and measurement point.



Former image

Linear beam spot type (-MK)

Even the object which looks flat has some roughness at the surface. This roughness cause the variation with the measurement result. By using line-spot type, averaging the influence and allow the stable measurement even on the rough surface.



Head lineup

	HL-C201F(-MK)	HL-C201A-SP2(M)	HL-C201A-SP3(M)	HL-C203F(-MK)	HL-C205B(-MK) HL-C205C(-MK)	HL-C208B(-MK) HL-C208C(-MK)	HL-C211F(-MK) HL-C211F5(-MK)	HL-C235BE(-MK) HL-C235CE(-MK)	HL-C235CE-W(-MK)
Measurement center distance	10mm	8mm	15mm	30mm	50mm	85mm	110mm	350mm	350mm
Measuring range	±1mm	±0.8mm	±1mm	±5mm	±5mm	±20mm	±15mm	±50mm	±200mm
Resolution	0.01μm	0.01μm	0.01μm	0.025μm	0.05μm	0.15μm	0.1μm	0.5μm	0.5μm
Beam size	ϕ20μm	ϕ20μm	ϕ30μm	ϕ30μm	ϕ70μm	ϕ100μm	ϕ80μm	ϕ250μm	ϕ400μm

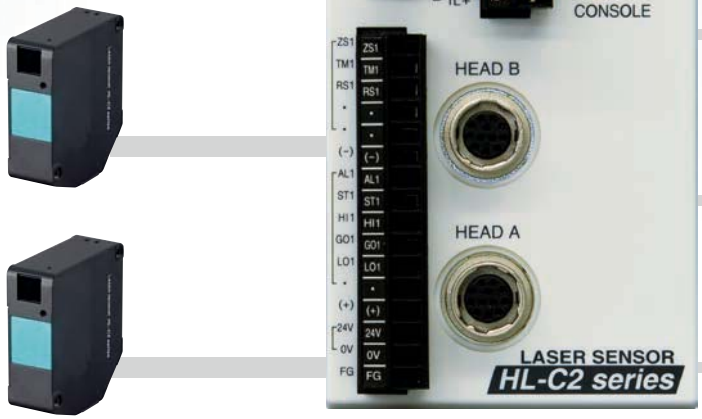
HL-C2

Ultra High-speed / High-precision
Laser Displacement Sensor

Ethernet type
HL-C21C(-P)

RS-232C type
HL-C2C(-P)

Controller
HL-C21C(-P)
HL-C2C(-P)



Console connection cable
HL-C2GT-C3

Programmable display
GT12

USB 2.0

PC

Analog voltage /
current output

Data Monitoring device

Ethernet or RS-232C
(by model selection)

PLC

I/O

Devices
Relays, Switches

2 heads with 1 controller

Calculation function is implemented to the controller.
This function allow output of the calculation result from the thickness measurement and 2-point gap measurement directly.

(Typical examples of the calculation)
A+B
-(A+B)
A-B
B-A

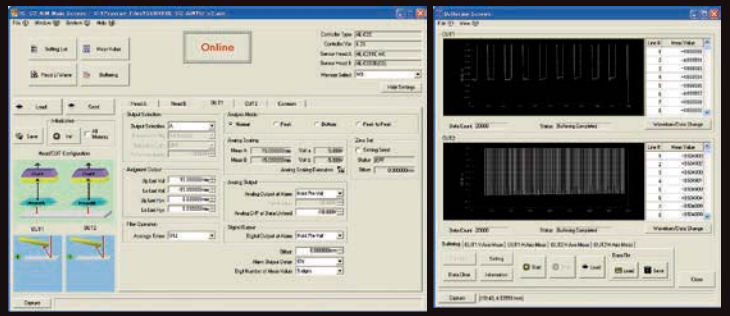
Easy oparation

Combining a software tool (Intelligent Monitor HL-C2AiM or Collecting data HL-C2AiG) or Programmable Display GT12, it shows not only measurement results but also received light waveform.

Setting software

HL-C2AiM

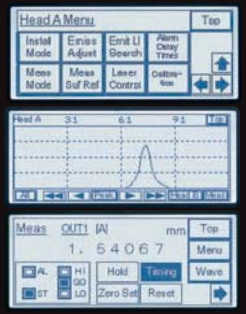
Easy waveform monitoring and function setting by PC. The software is available on the website.



Programmable Display

GT12

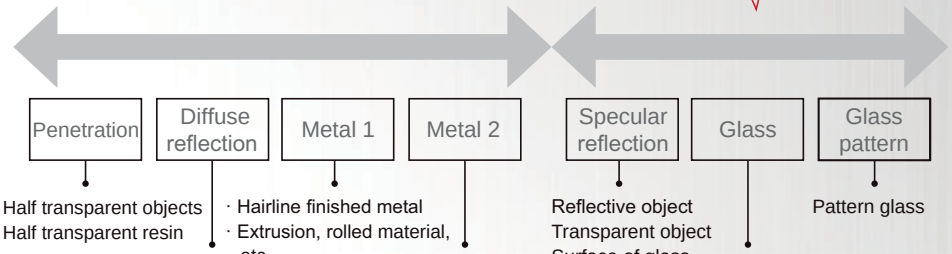
GT12 can be used as the console, by downloading screen data from website. (Waveform display, setting, etc)



Adjusting the setting, varieties of objects can be measured.

Diffuse reflective setting

Specular reflective setting



- Half transparent objects
- Half transparent resin

- Hairline finished metal
- Extrusion, rolled material, etc

Reflective object
Transparent object
Surface of glass

Pattern glass

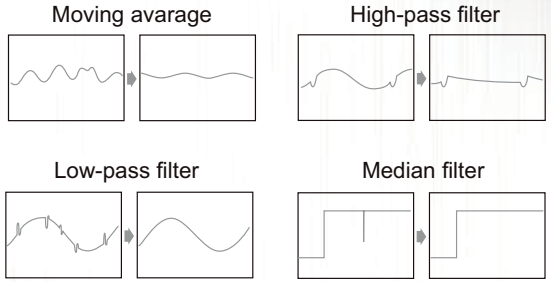
Any objects other than mirror-surface or transparent objects
Metal, resin, ceramic, etc.

- Hard hairline finished metal
- Materials with tiny scratch, cutting mark, grinding mark

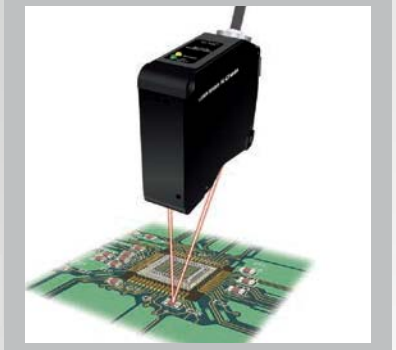
- Clearance of glass, thickness

Various filter functions

By using suitable filters, customer can realize the high precision measurement.



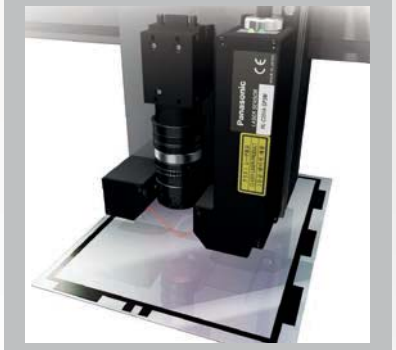
Applications



Measurement of
the heights of chip parts

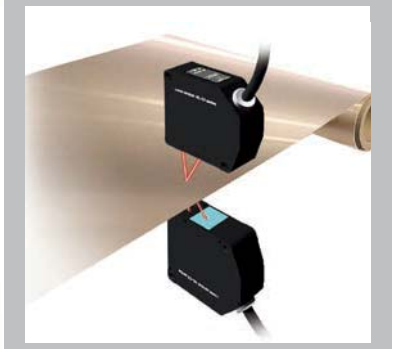
Measurement of
HDD surface variations

Detection of deformed
narrow pitch connector leg pins



Controling the camera focus

Measurement of
disk brake thickness



Measurement of the thickness of
copper clad laminate

Gap measurement between
glass and bottom layer

Controlling
the nozzle height of a dispenser

HL-G1

Compact Laser Displacement Sensor

High resolution and Fast response

Resolution	Sampling rate
0.5μm	200μs

Timing input and multi input

In addition to timing input select the desired input according to your application.

- Zero set on/off
- Laser control
- Reset
- Teaching
- Memory switching
- Saving

Featuring 3 digital and one analog output

- HI/GO/LOW judgment output or Alarm output
- Analog output: current and voltage modes

Compact size with the built-in controller and digital output

As a self contained sensor, the HL-G1 series offers a space saving configuration by removing the need for an external controller.

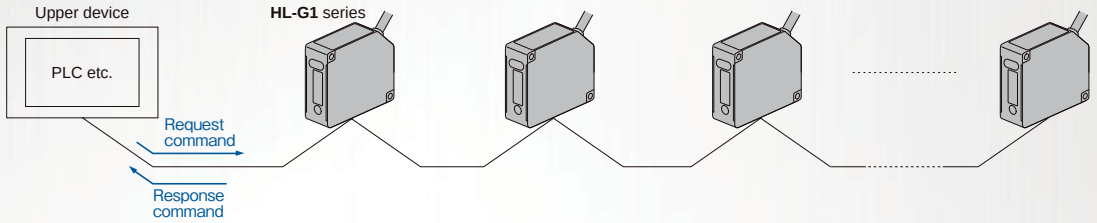
IP67 dust- and water-proof protective enclosure

Exclusive optical equipment and diaphragm structure sustain laser beam of high quality at a radiant density that is close to ideal in the Gaussian distribution.

High functionality type

Connect to upper devices of RS-422/485.

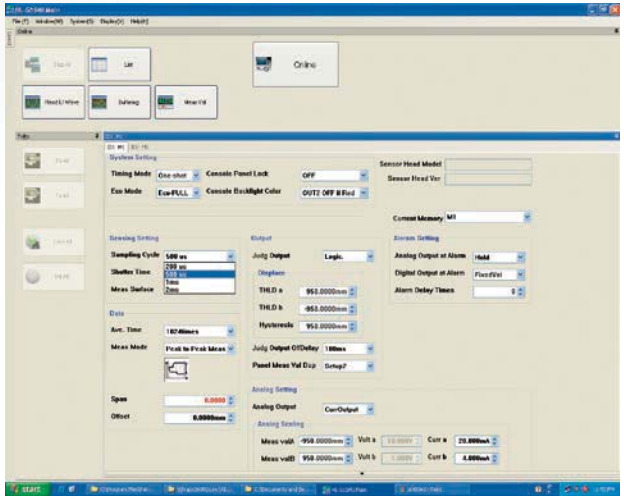
The HL-G1 can be connected to upper devices of RS-422/485.
When upper device sends the request command, the HL-G1 series sends the response command.

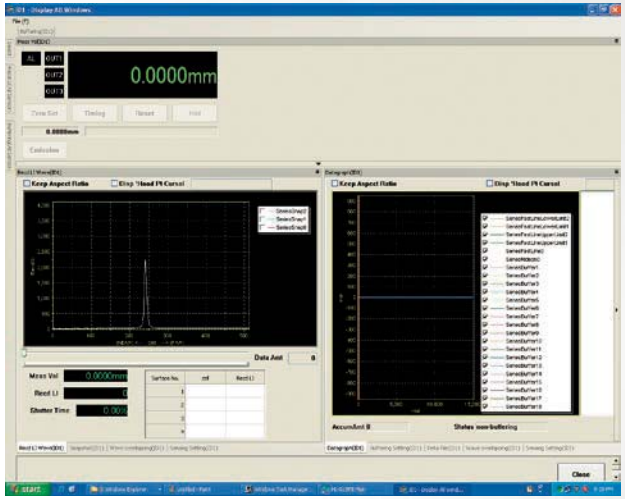


Software tool for sensor configuration and evaluation

In addition to configuring up to 16 sensors at once, this free tool makes it easy to gather data needed for analysis, including received light waveform monitoring and data buffering. The interface language can be selected at the time of installation.

- Data buffering
- Received light waveform display
- Measured value display





HMI screen for the HL-G1 series

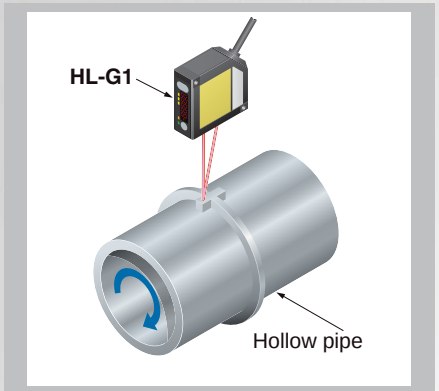
The GT02 / GT12 HMI operator panel can be used in combination with the HL-G1 to allow easy confirmation of sensor status and configuration of sensor settings from a remote location.
Japanese, English, Chinese, and Korean are supported.

Diffuse reflective model

Specular reflective model

	Diffuse	Specular	Diffuse	Specular	Diffuse	Specular	Diffuse	Diffuse
								
	HL-G103□	HL-G103A□	HL-G105□	HL-G105A□	HL-G108□	HL-G108A□	HL-G112□	HL-G125□
Measurement center distance	30mm	26.3mm	50mm	47.3mm	85mm	82.9mm	120mm	250mm
Measuring range	±4mm	±2mm	±10mm	±5mm	±20mm	±10mm	±60mm	±150mm
Resolution	0.5μm	0.5μm	1.5μm	1.5μm	2.5μm	2.5μm	8μm	20μm
Beam size	ϕ0.1mm	ϕ0.1mm	ϕ0.5×1mm	ϕ0.1mm	0.75×1.25mm	ϕ0.2mm	1.0×1.5mm	1.75×3.5mm

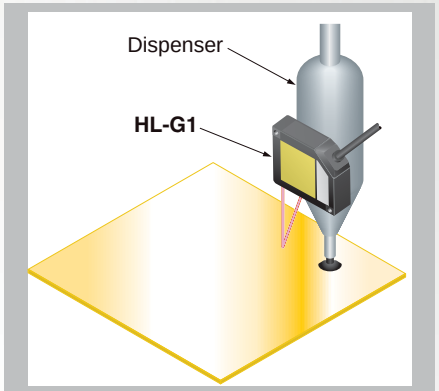
Applications



Control of hollow pipe positioning

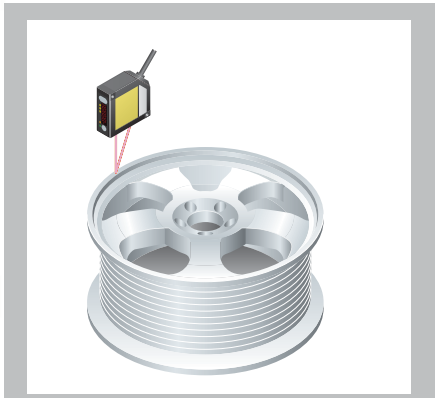
Detecting rotating direction of fan

Positioning of wafer

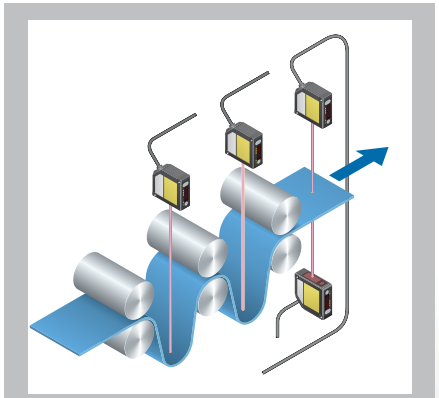


Controlling the height
of a dispenser nozzle

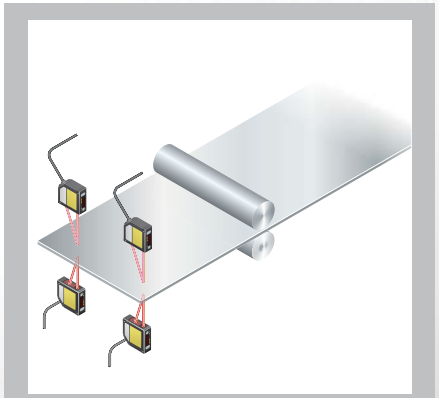
Inspecting processed food quantities



Detection of aluminum wheel grooves



Testing sheet slack

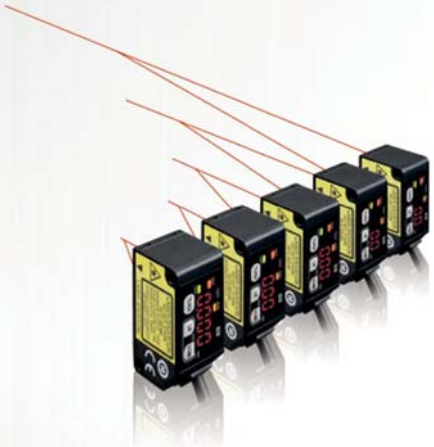


Measuring the thickness
of a steel plate

HG-C

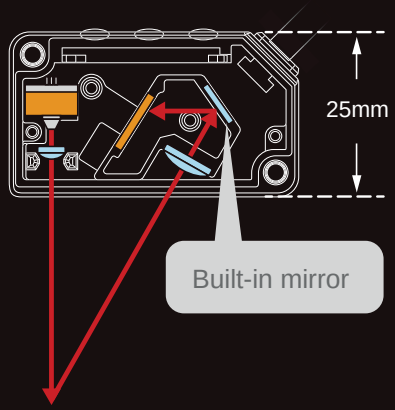
Micro Laser Distance Sensor

Repeatability	Linearity	Response time
10μm	±0.1%F.S.	1.5ms



A new optical system with a built-in mirror

The HG-C series sensors incorporating a new optical system with a built-in mirror provides smaller sensor depth as well as higher measurement accuracy equivalent to displacement sensors.



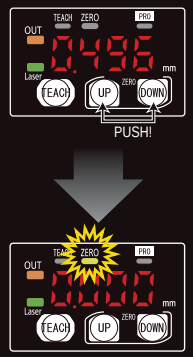
Standard equipped analog output

Analog output is provided in addition to control output.
It can be used as a simple measurement sensor.

Analog voltage output range: 0 to 5 V
Analog current output range: 4 to 20mA

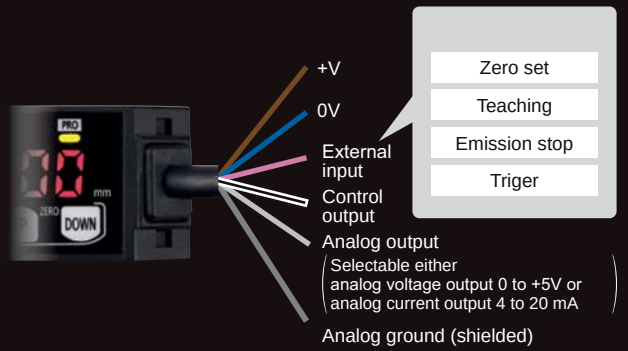
Zero set function

The zero point can be set at a desired value. It is useful when measuring steps or tolerance with reference to the height of a sensing object.



External input setting function

One of four functions, “zero setting function,” “teaching function,” “emission stopping function” and “trigger function” can be assigned to an external input line.

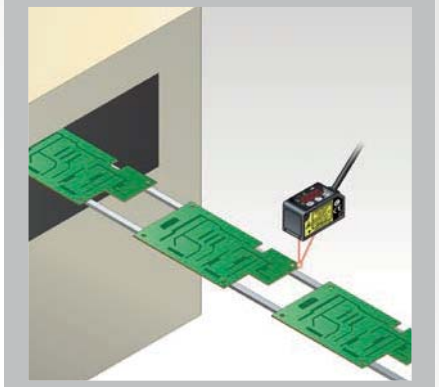


	HG-C1030□	HG-C1050□	HG-C1100□	HG-C1200□	HG-C1400□
Measurement center distance	30mm	50mm	100mm	200mm	400mm
Measuring range	±5mm	±15mm	±35mm	±80mm	±200mm
Repeatability	10μm	30μm	70μm	200μm	Measuring distance 200 to 400 mm: 300μm; 400 to 600 mm: 800μm
Beam diameter	ϕ50μm	ϕ70μm	ϕ120μm	ϕ300μm	ϕ500μm

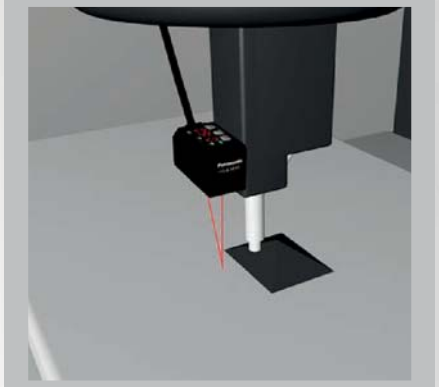
Applications

Controlling the mounter head height

Detecting on-vehicle seats

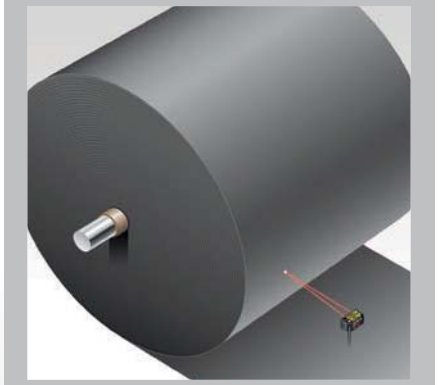


Detecting warpage of a circuit board

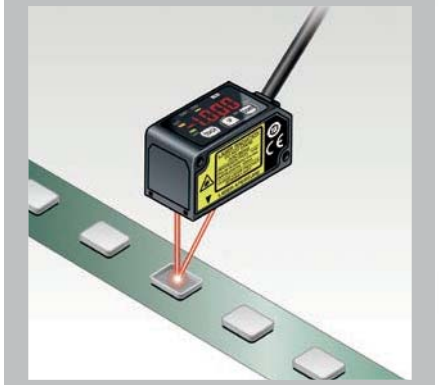


Measuring the distance of 3D printer injector and part

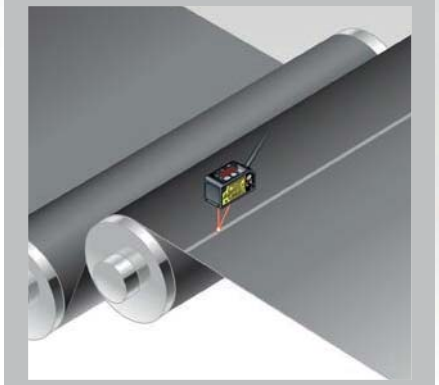
Checking of correct pins alignment of connector



Measurement of a remaining functional sheet



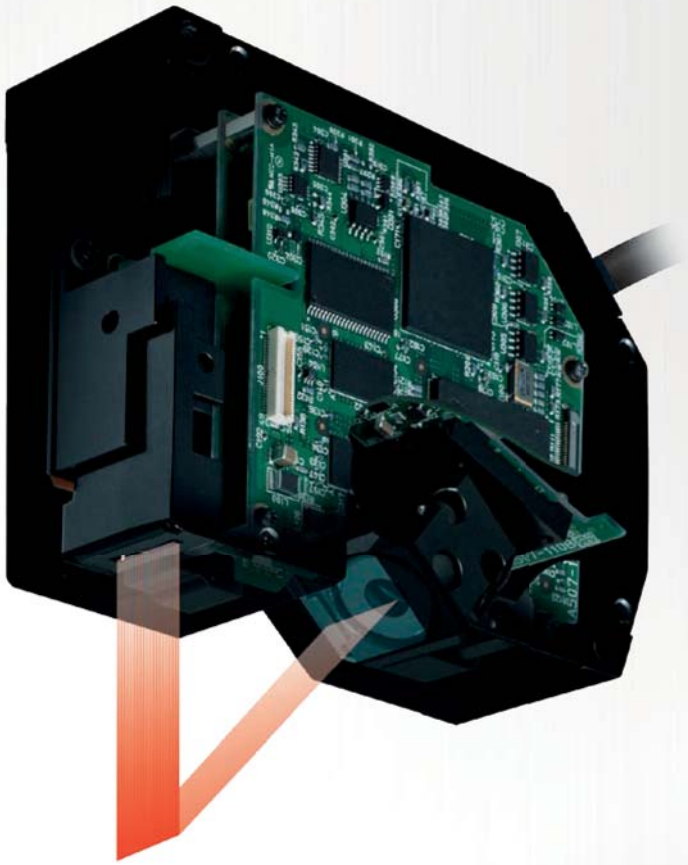
Judging front or back of cover of electric parts



Detecting a seam (overlap) of functional sheet

HL-D3

High Speed, Multi-Point Laser Displacement Sensor



High Speed Multi-point Sensing

Resolution

Z axis

1μm

Sampling rate

80μs

Measurement range of width (X axis)

12.5 mm

*measurement center

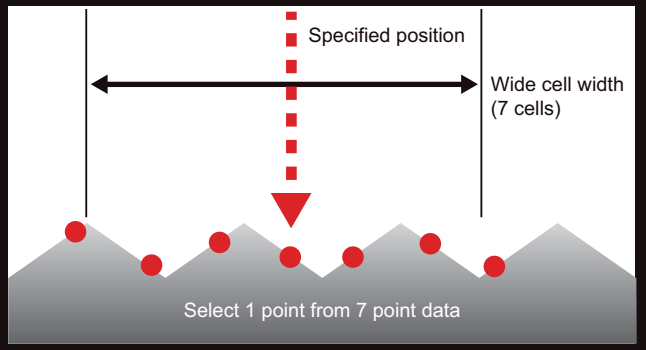
Parallel beam

HL-D3 adopts parallel beam made possible by the latest optical system. The reduced area of shadow that appears when light is emitted on the target object made it possible to accurately sense the shape of the object.

Wide-cell function

When the surface condition is rough, such as with cut metal, sensing of a single point will result in errors due to the uneven surface.

The wide-cell function expands the sensing points for the light receiving side and obtains the mean value (or maximum or minimum value, depending on the setting) to improve the stability of the measurements.



Multiple Shape Calculation Functions

The HL-D3 series calculates the shapes, including the height difference, width, and cross-sectional area, from the shape waveform based on the received light. At the same time, the displacement sensor uses these calculation results to instantaneously make Hi / Go / Lo judgments based on the present upper and lower limits.
Thanks to the two sets of output, different shape calculations can be performed for each output or two sensor heads can be connected and used to output each judgment results.

Multiple Shape Calculation Functions

Height calculation

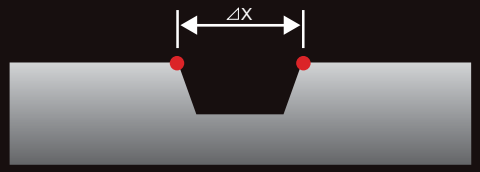
The height difference between the reference value and measured value is calculated.

Step calculation

The height difference is calculated from 2 measured values.

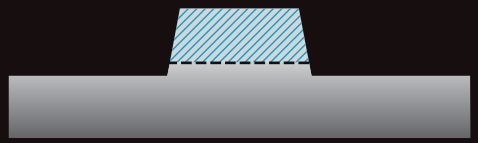
Width calculation

The width is calculated from 2 measured values.



Cross-sectional area calculation

HL-D3 calculates the cross-sectional area defined by the reference value.



Settings & Monitoring Software HL-D3SMI

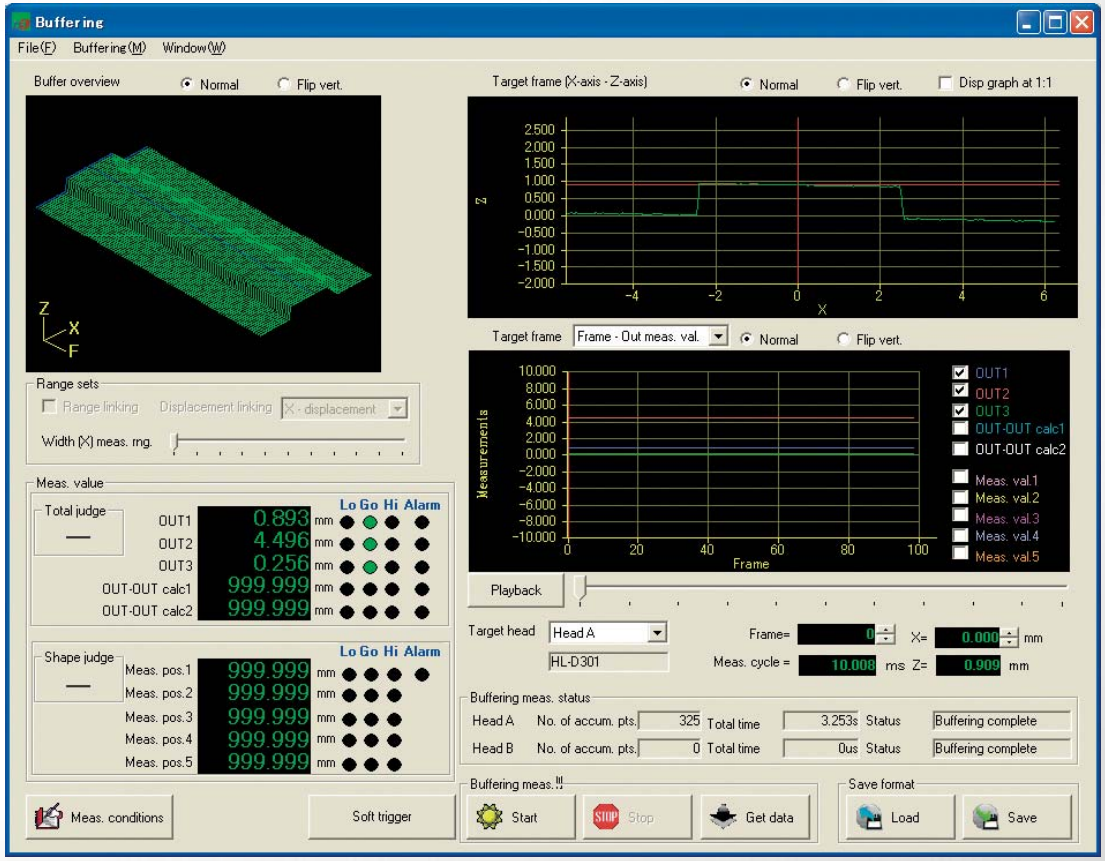
Conditions and the monitoring of measurements and judgment results can easily be set up by connecting to the HL-D3C controller and a PC pre-installed with HL-D3SMI using USB cables. The shape waveform based on the saved data can be reproduced on screen, which allows for it to be used as an analytical tool.

■ Store displacement shape waveform data, calculated measured values, and judgment results on the memory built into the controller during continuous sensing.

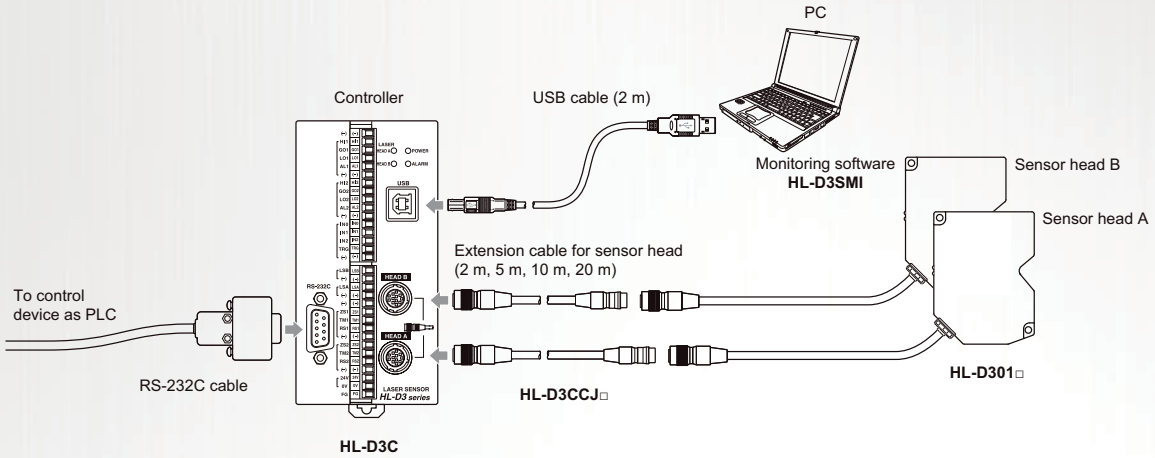
■ Provides a stereoscopic representation of the shape by a 3D display of stored data.

■ Replay the stored data on the buffering screen at a later time, provided that the stored data is saved in the dedicated file format.

■ Allow waveform display and analysis by means of spreadsheet software based on the data saved in CSV file format.



System configuration



Line-up

	HL-D301B	HL-D301C
Laser class	Class 2	Class 3R
Measurement center distance	50mm	
Measuring range (Z axis)	±10mm	
Width (X axis)	12.5mm	
Resolution (Z axis)	1μm	

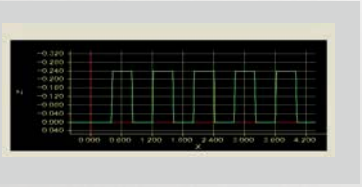
Applications

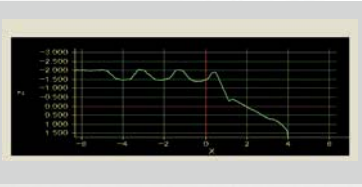
Detecting misaligned pins on surface mounted components

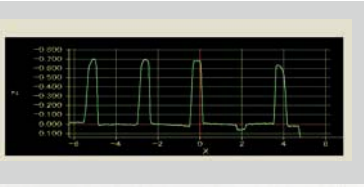
Sensing objects with sloped profile

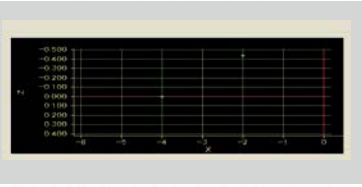
Sensing objects using both gold plates and black resin

Checking for loose screws







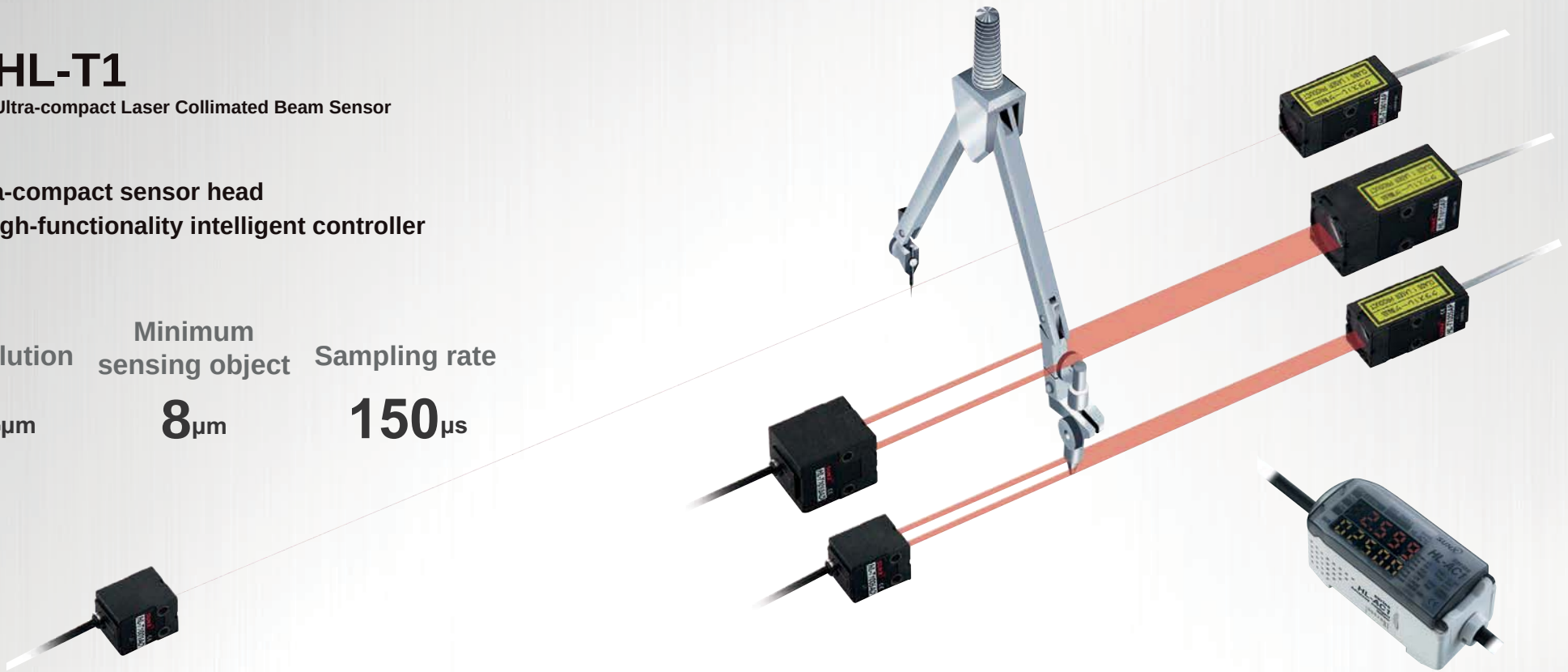


HL-T1

Ultra-compact Laser Collimated Beam Sensor

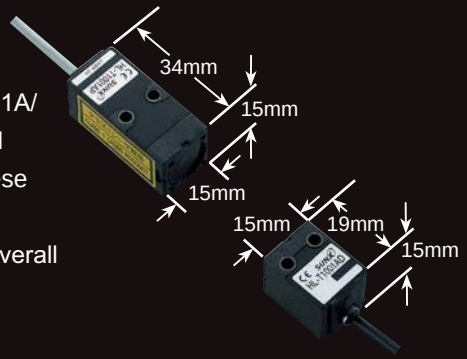
Ultra-compact sensor head
A high-functionality intelligent controller

Resolution	Minimum sensing object	Sampling rate
4μm	8μm	150μs



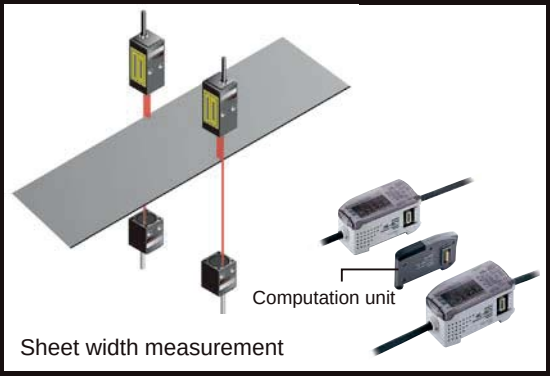
Small sensor head

The most compact size (HL-T1001A/ T1005A) and yet the highest level of performance in their class. These sensors require less space for installation and contribute to overall space savings.



Computations for 2 sensors

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



Sheet width measurement

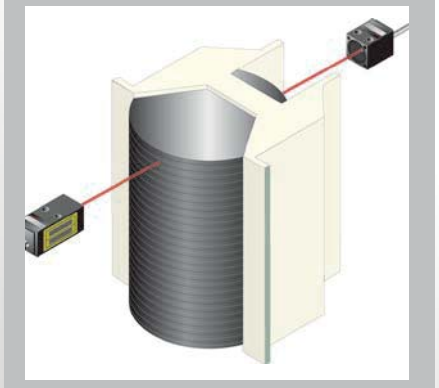
Sensor head

Type	ϕ1mm type HL-T1001A		5mm type HL-T1005A	10mm type HL-T1010A
Sensing range	0 to 500mm	500 to 2,000mm	0 to 500mm	0 to 500mm
Sensing width	ϕ1mm	ϕ1 to ϕ2.5mm	5mm	10mm
Minimum sensing object	ϕ8μm opaque object	ϕ50μm opaque object	ϕ0.05mm opaque object	ϕ0.1mm opaque object
Repeatability	4μm	———	4μm	4μm

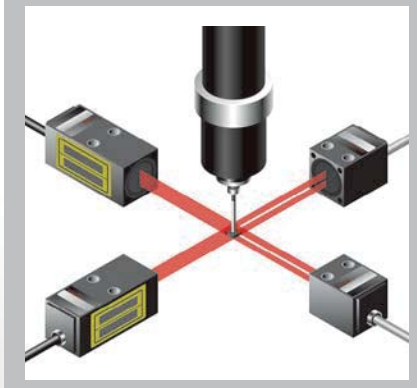
Controller

Type	NPN output type HL-AC1	PNN output type HL-AC1P
Supply voltage	12 to 24V DC ±10%	
Measurement rate	150μs	
Linear output	Current output: 4 to 20mA/F.S. Voltage output: ±4V/F.S.	

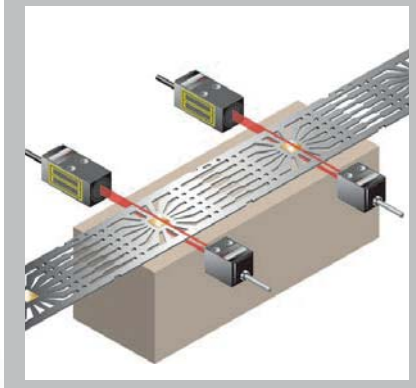
Applications



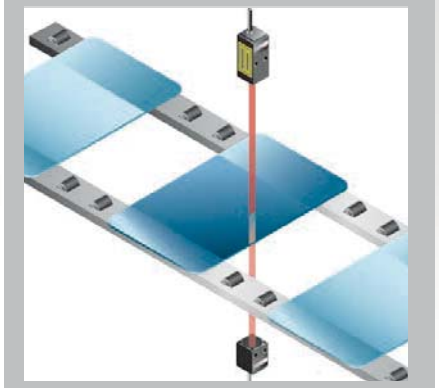
Sensing wafer position in wafer cassette



Checking the positioning of chip components



Detecting defective lead frame seating



Distinguishing opacity of glass

HG-S

Contact-Type Digital Displacement Sensor

Slim and Robust sensor

Resolution	Indication accuracy
0.1μm	1.0μm or less

*10mm type sensor head

Measurement range

10mm/32mm

Sensor head

Slim body

The slim unit body contains plain bearings with 2-point support structure disperses load and achieves superb durability. The sensor head offers long life and reduces maintenance costs dramatically.

2-point support structure

Ball-less bearings are installed at the upper and lower sections of the unit. This ensures excellent strength against lateral loads.

No "value skipping" or "unset zero point"

Displacement is measured by reading a glass scale with a different slit pattern at each reading position using a high-resolution sensor. This eliminates "value skipping" even when measuring at high speed, and there is no concern of "unset zero point".

Hot-swappable

The sensor head can be changed safely without turning off the controller. This reduces the man-hours required for the change of line setup for processing of different workpieces, thus achieving a significant reduction of setup change time.

Controller

Dual display

The 2-line digital display simultaneously shows head measurement (measured value) and judgment value (calculated value).

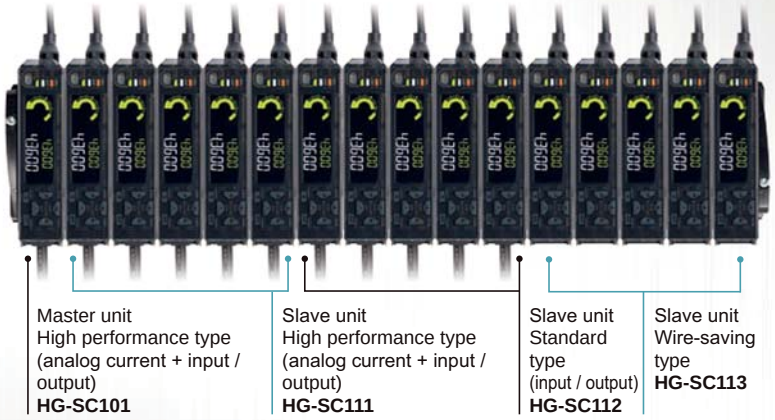
Intuitive circle meter

Values between allowable maximum and minimum values are indicated in green. Values outside of the allowable range are indicated in orange. This provides at-a-glance understanding of the margin to the tolerance limits.

Connection of up to 15 slaves units

One master unit can be connected with up to 15 slave units in any order. This allows easy multi-point calculations.

(Example: Connection of 15 slave units)



*End plates (optional) must be mounted on both sides of the controller after the connection of slave units.

Sensor head

	HG-S1010	HG-S1010R	HG-S1110	HG-S1110R	HG-S1032
Type	Standard	Low measuring force	High precision Standard	High precision Low measuring force	Standard
Measuring range	10mm	10mm	10mm	10mm	32mm
Resolution	0.5μm	0.5μm	0.1μm	0.1μm	0.5μm

Controller

Master unit		Slave unit	
HG-SC101 HG-SC101-P	HG-SC111 HG-SC111-P	HG-SC112 HG-SC112-P	HG-SC113
High performance Analog current output		Standard	Wire-saving

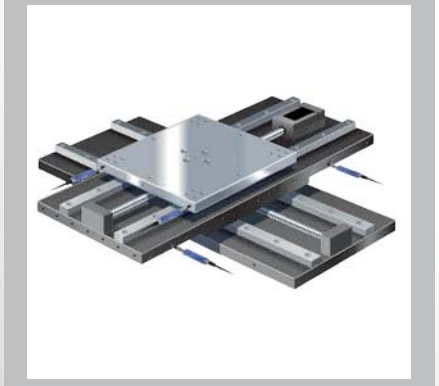
Applications

Screw head height measurement

Transmission parts height measurement

Motor shaft eccentricity measurement

Automotive parts dimension measurement



X-Y stage position measurement

Tablet surface flatness measurement

Resin roller eccentricity measurement

Coupling assembly inspection

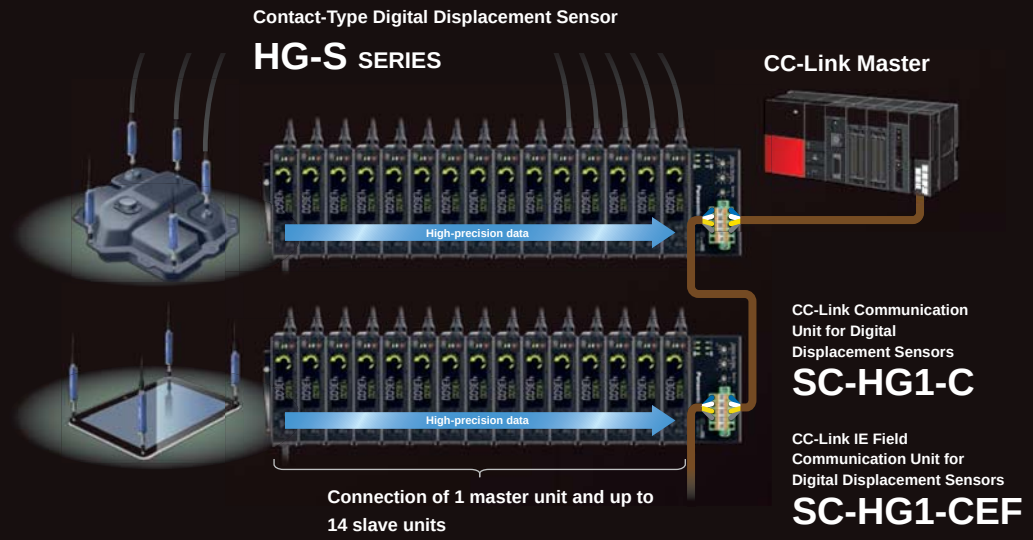
SC-HG1-C / SC-HG1-CEF

CC-Link / CC-Link IE Field Communication Unit
for Digital Displacement Sensors

Direct connect to CC-Link master

Program-less transmission of high-precision data

Batch change of internal settings via CC-Link

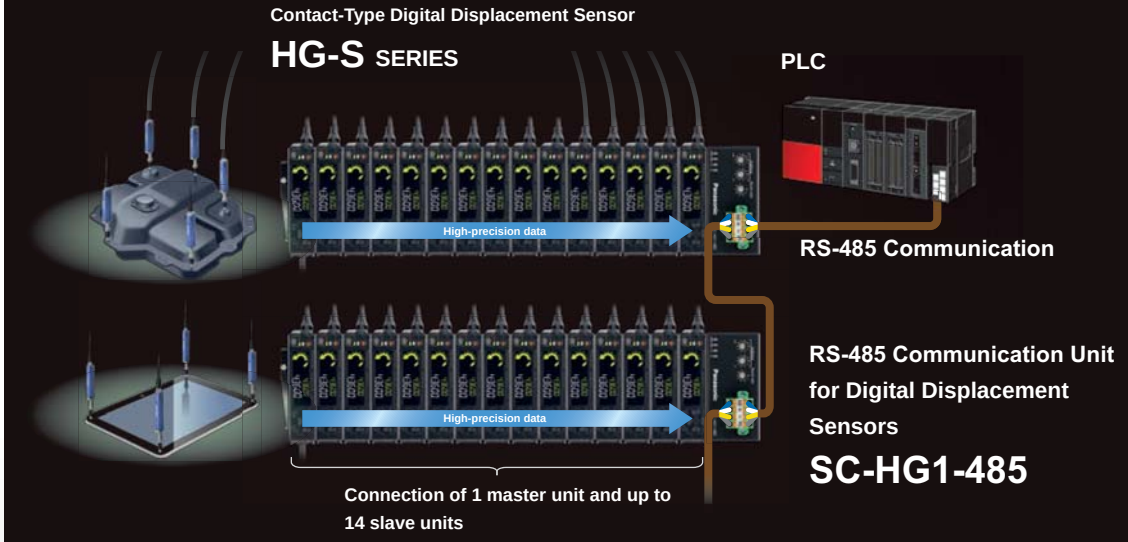


SC-HG1-485

RS-485 Communication Unit
for Digital Displacement Sensors

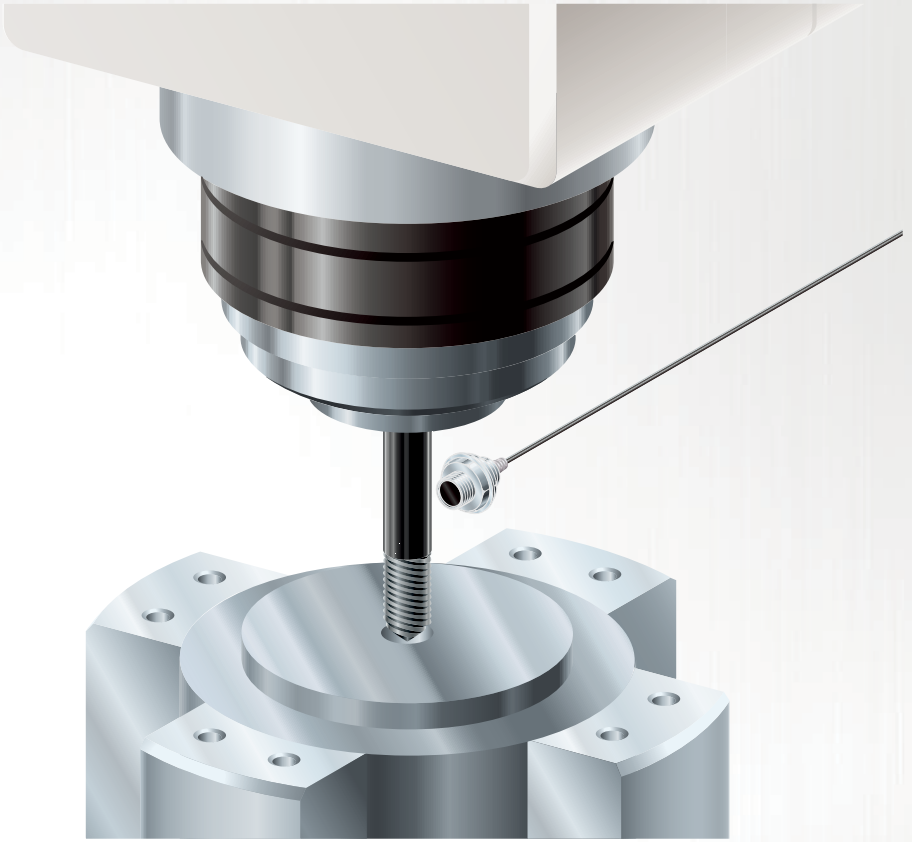
Direct transfer of high-precision measurement values

Batch change of internal settings via RS-485



GP-X

High Speed / High Accuracy Eddy Current Type Digital Displacement Sensor



High-speed sampling and high resolution.

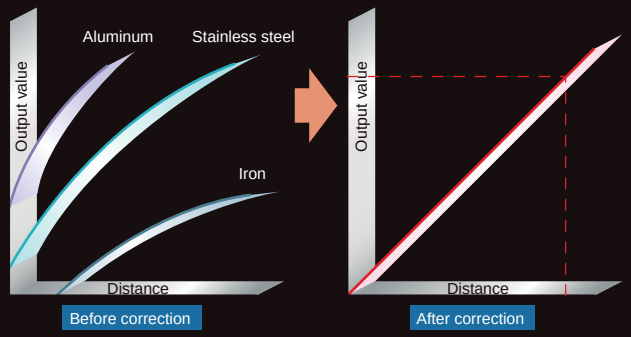
Sampling rate	Linearity	Resolution
25μs	**±0.3% F.S.**	**0.32μm**

0.02 % F.S. resolution for highly accurate measurement

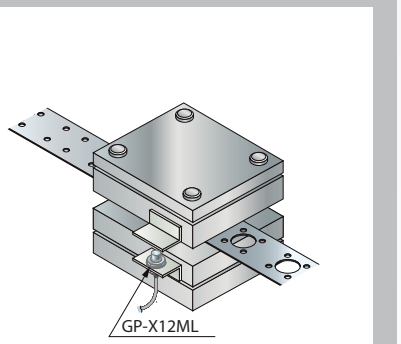
With high resolution, 0.02 % F.S. (Note), they can perform highaccuracy measurements of micro-displacements. (Average number of samples: 64)
Note: GP-XC3SE and GP-XC5SE Resolution: 0.04 %F.S.

Optimal correction of the output characteristics

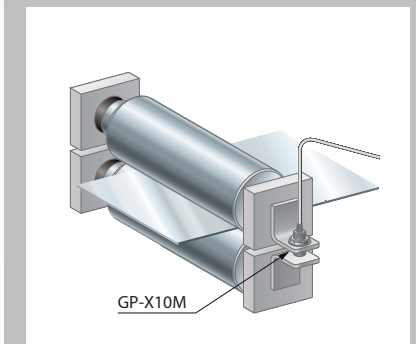
Because they perform with a 0.3 % F.S. linearity, they can be used for sensing stainless steel and iron enabling precise measurements not affected by the work's material. Specifications corresponding to each material (stainless steel, iron, aluminum) has already been inputted in the controller enabling the easy selection of the setting that is most suitable for the particular material used.



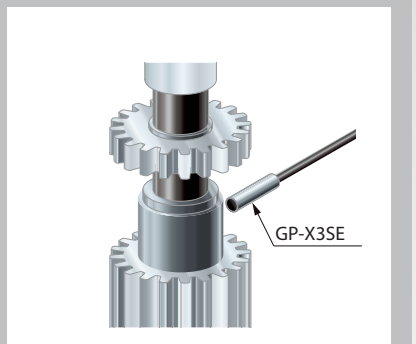
Applications



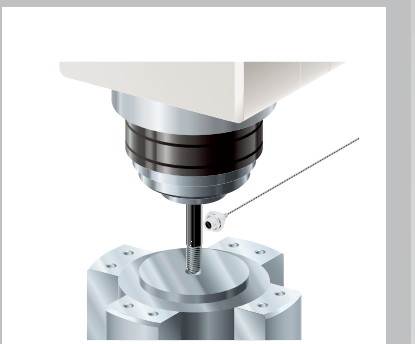
Stroke end sensing



Gap sensing



Eccentricity sensing



Measuring the eccentricity of tools






Type	GP-XC22KL(-P)	GP-XC12ML(-P)	GP-XC10M(-P)	GP-XC8S(-P)	GP-XC5SE(-P)	GP-XC3SE(-P)
Measuring range	10mm	5mm	2mm	2mm	1mm	0.8mm
Appearance	ϕ22mm	M12	M10	ϕ8mm	ϕ5.4mm	ϕ3.8mm

Programmable logic controller FP7

FP7 allows building traceability system by the remote monitoring and data logging functions, addition to the equipment control.

Program capacity

196k steps

Ultra high speed processing

11 ns/step

I/O points

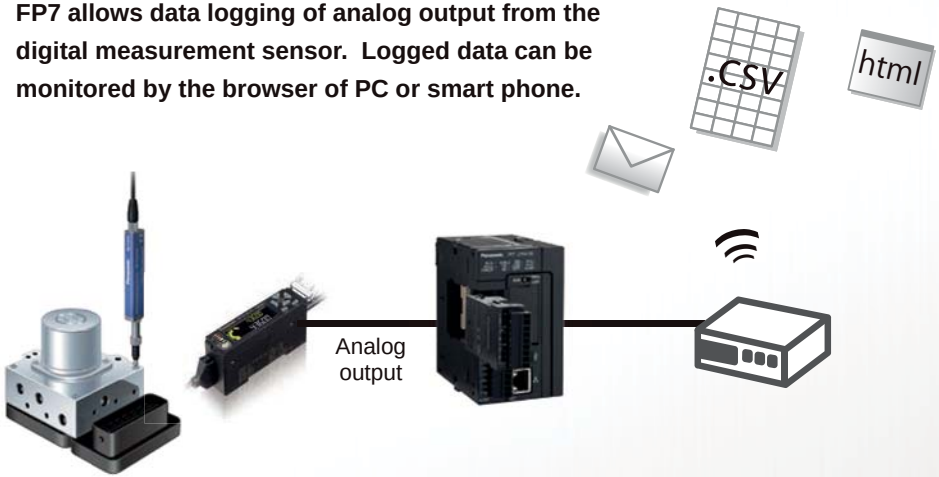
Max. 4096 Points

Add-on cassettes
Analog input unit
AFP7FCAD2

Programmable
controller
FP7

AFP7FCAD2
2-channel analog input 0–10V/0–5V/0–20mA, resolution
12 bit, conversion speed 1ms/channel (non-insulated)

FP7 allows data logging of analog output from the digital measurement sensor. Logged data can be monitored by the browser of PC or smart phone.



Digital
displacement
sensor

FP7
Web server
function

Wi-Fi rooter

Programmable logic controller
FP7

CPU units

Standard model

EtherNet/IP

AFP7CPS41E

EtherNet/IP

AFP7CPS31E

AFP7CPS31

AFP7CPS21

Analog input and output units

Input units

Analog input unit
High-speed and high-accuracy type
4 points, voltage and current
AFP7AD4H

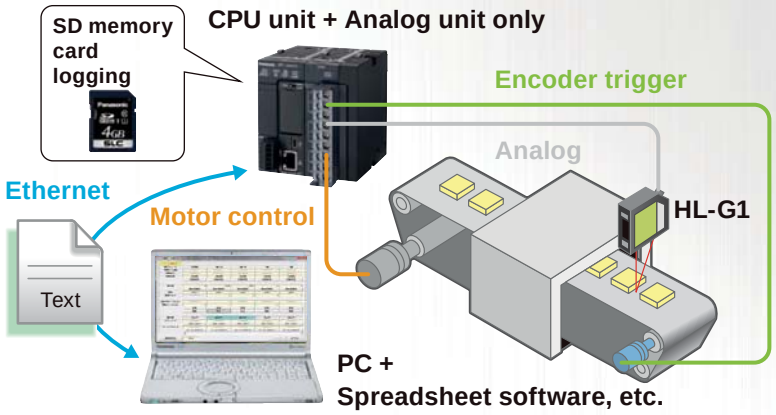
Analog input unit
High-speed and multi-channel type
8 points, voltage and current
AFP7AD8

Add-on cassettes

Function cassettes

Analog input
AFP7FCAD2

Analog input and output
AFP7FCA21



Programmable logic controller

New standard for compact PLCs

FP0R

Program capacity

32k steps

Ultra high speed processing

80 ns/step

I/O points

Max. **128** Points

Powerful compact PLC

FPΣ

Program capacity

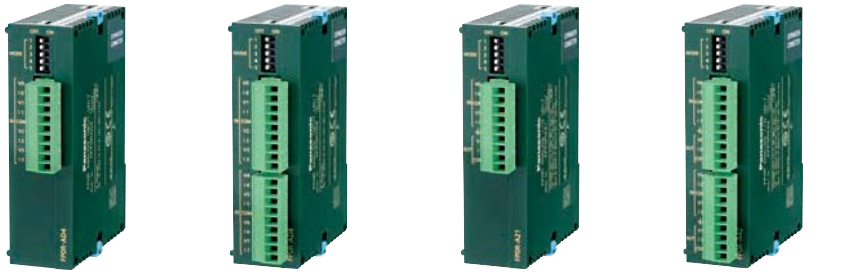
32k steps

High speed processing

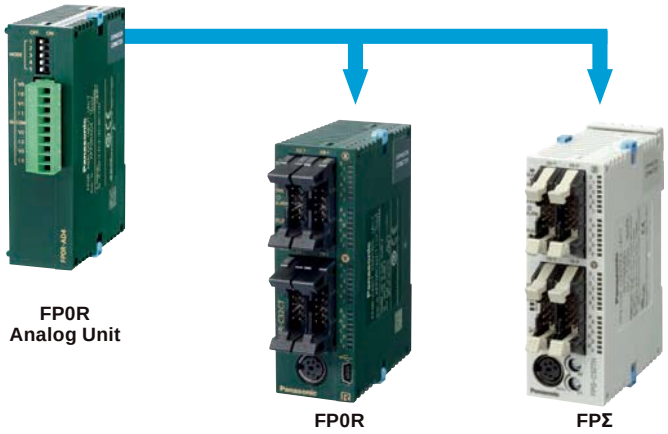
320 ns/step

I/O points

Max. **384** Points



Analog Input Unit Input: 4 channels	Analog Input Unit Input: 8 channels	Analog I/O Unit Input: 2 channels / Output: 1 channel	Analog I/O Unit Input: 4 channels / Output: 2 channels
AFP0RAD4	AFP0RAD8	AFP0RA21	AFP0RA42



FP0R
Analog Unit

FP0R

FPΣ

Consoles for measurement sensors

Programmable Display

GT02

Pure black

Hairline silver

Programmable Display

GT12

Hairline silver

Pure black

GT02 / GT12 **Bright three-color LED background**

M type	White	Pink	Red
G type	Green	Orange	Red

Ultra High-speed / High-precision Laser Displacement Sensor

HL-C2

Compact Laser displacement Sensor

HL-G1

GT12 Selection 4 models

(RS232C, No SD card slot)

GT02 Selection 4 models

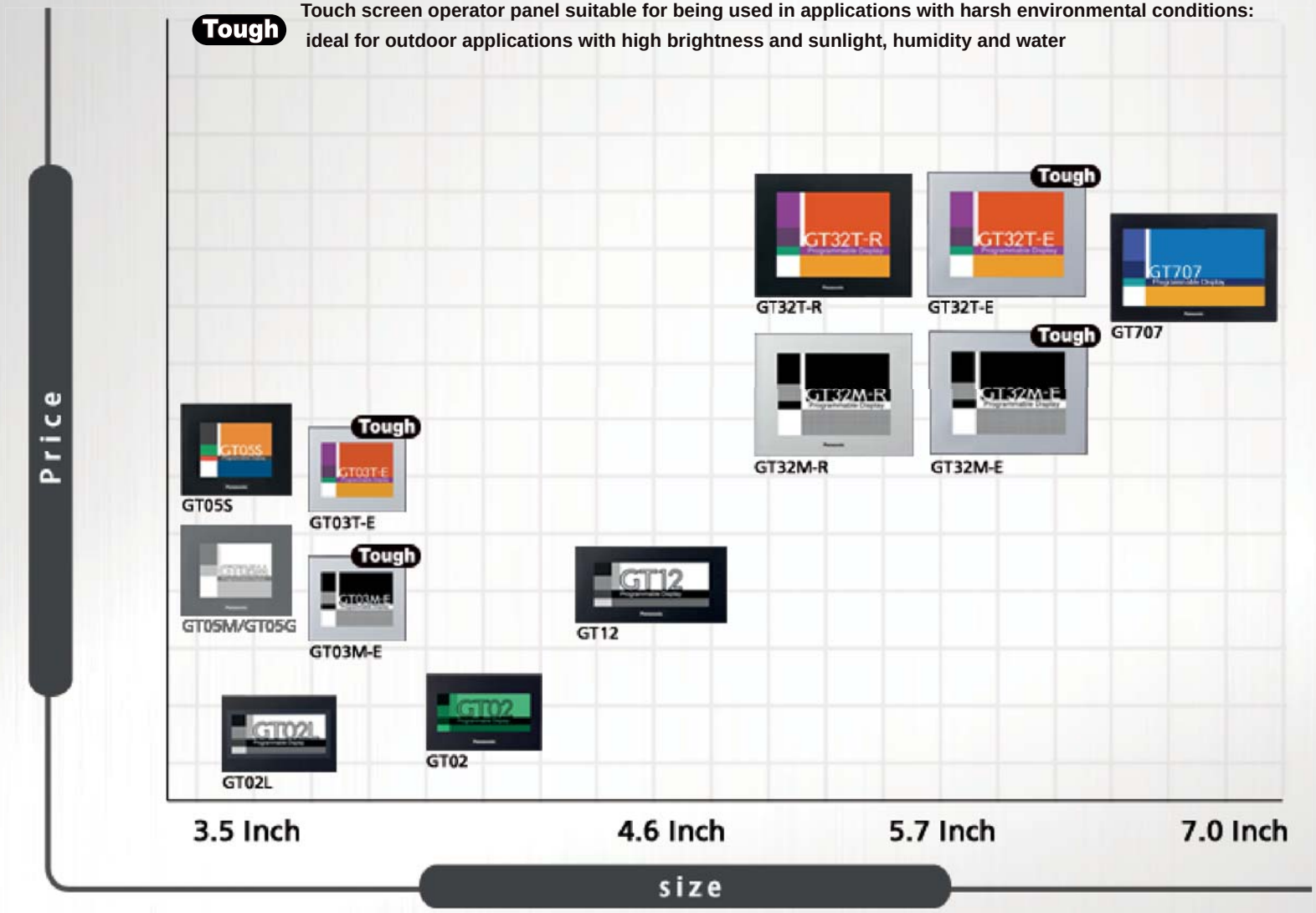
(24V, RS485, No SD card slot)

GT12 Selection 8 models

(RS485, With/ without SD card slot)

*Not using SD card for console purpose)

Human Machine Interface
GT series



Global Network

Please Contact our Global Sales Companies in:

Europe

Headquarters	**Panasonic Electric Works Europe AG**	Robert-Koch-Straße 100, 85521 Ottobrunn, Tel. +49 89 45354-1000, Fax +49 89 45354-2111, www.panasonic-electric-works.com
Austria	**Panasonic Electric Works Austria GmbH**	Josef Madersperger Str. 2, 2362 Biedermannsdorf, Tel. +43 (0) 2236-26846, Fax +43 (0) 2236-46133 www.panasonic-electric-works.at
	Panasonic Industrial Devices Materials Europe GmbH	Ennshafenstraße 30, 4470 Enns, Tel. +43 (0) 7223 883, Fax +43 (0) 7223 88333, www.panasonic-electronic-materials.com
Benelux	**Panasonic Electric Works Sales Western Europe B.V.**	De Rijn 4, (Postbus 211), 5684 PJ Best, (5680 AE Best), Netherlands, Tel. +31 (0) 499 372727, Fax +31 (0) 499 372185, www.panasonic-electric-works.nl
Czech Republic	**Panasonic Electric Works Europe AG, organizacní složka**	Administrative centre PLATINIUM, Veverí 3163/111, 616 00 Brno, Tel. +420 541 217 001, Fax +420 541 217 101, www.panasonic-electric-works.cz
France	**Panasonic Electric Works Sales Western Europe B.V.**	Succursale française, 10, rue des petits ruisseaux, 91370 Verrières Le Buisson, Tél. +33 (0) 1 6013 5757, Fax +33 (0) 1 6013 5758, www.panasonic-electric-works.fr
Germany	**Panasonic Electric Works Europe AG**	Robert-Koch-Straße 100, 85521 Ottobrunn, Tel. +49 (0) Tel. +49 (0) 45354-1000, Fax +49 (0) 45354-2111, www.panasonic-electric-works.de
Hungary	**Panasonic Electric Works Europe AG**	Magyarországi Közvetlen Kereskedelmi Képviselet, 1117 Budapest, Neumann János u. 1., Tel. +43 2236 26846-25, Mobile: +36 20 264 9896, Fax +43 2236 46133, www.panasonic-electric-works.hu
Ireland	**Panasonic Electric Works UK Ltd.**	Irish Branch Offi ce, Dublin, Tel. +353 (0) 14600969, Fax +353 (0) 14601131, www.panasonic-electric-works.co.uk
Italy	**Panasonic Electric Works Italia srl**	Via del Commercio 3-5 (Z.I. Ferlina), 37012 Bussolengo (VR), Tel. +39 0456752711, Fax +39 0456700444, www.panasonic-electric-works.it
Nordic Countries	**Panasonic Electric Works Europe AG**	Filial Nordic, Knarrarnäsgatan 15, 164 40 Kista, Sweden, Tel. +46 859476680, Fax +46 859476690, www.panasonic-electric-works.se
	Panasonic Eco Solutions Nordic AB	Jungmansgatan 12, 21119 Malmö, Tel. +46 40 697 7000, Fax +46 40 697 7099, www.panasonic-fi re-security.com
Poland	**Panasonic Electric Works Polska sp. z o.o**	ul. Wołoska 9A, 02-583 Warszawa, Tel. +48 22 338-11-33, Fax +48 22 338-12-00, www.panasonic-electric-works.pl
Spain	**Panasonic Electric Works España S.A.**	Barajas Park, San Severo 20, 28042 Madrid, Tel. +34 913293875, Fax +34 913292976, www.panasonic-electric-works.es
Switzerland	**Panasonic Electric Works Schweiz AG**	Grundstrasse 8, 6343 Rotkreuz, Tel. +41 (0) 41 7997050, Fax +41 (0) 41 7997055, www.panasonic-electric-works.ch
United Kingdom	**Panasonic Electric Works UK Ltd.**	Sunrise Parkway, Linford Wood, Milton Keynes, MK14 6 LF, Tel. +44 (0) 1908 231555, Fax +44 (0) 1908 231599, www.panasonic-electric-works.co.uk

Panasonic®

Panasonic Electric Works Europe AG

Robert-Koch-Straße 100 · 85521 Ottobrunn
Tel. +49 89 45354-1000 · Fax +49 89 45354-2111
info.peweu@eu.panasonic.com
www.panasonic-electric-works.com