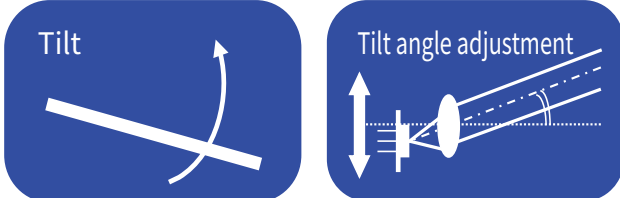


Smart LAC

A contactless angle measurement device by laser



- Instant non-contact angle measurement
- Wide working distance
(Angle Range $\pm 0.5\text{deg}$ at W.D.300mm)
- High precision and resolution
- Single and multiple spot measurement mode available
- Red, Green, Blue and Infrared laser available
- External beam measurement available

Note : Select Single or Multiple spot mode when ordering
All wavelength(RGB,IR) system can be measured External beam.

<Measurement comparison>

Conventional way

① Laser displacement sensor method

Displacement sensor Displacement sensor

<Topic>

- With tow sensors, hard to reach and measure micro-objects.

Calculate the Angle from between two point.

Laser Autocollimator method

<Solutions>

- Easy measurement with oly one sensor, even for hard to reach and micro-objects.

② Optical Autocollimator method

Monitor

Optical Autocollimator

<Topic>

- Visual measurement
- Expensive

Monitor

<Solutions>

- Digital measurement
- Competitive price

Easy tilting angle measurement for various DUT(Device Under Test)

Leaser beam needed for measurement



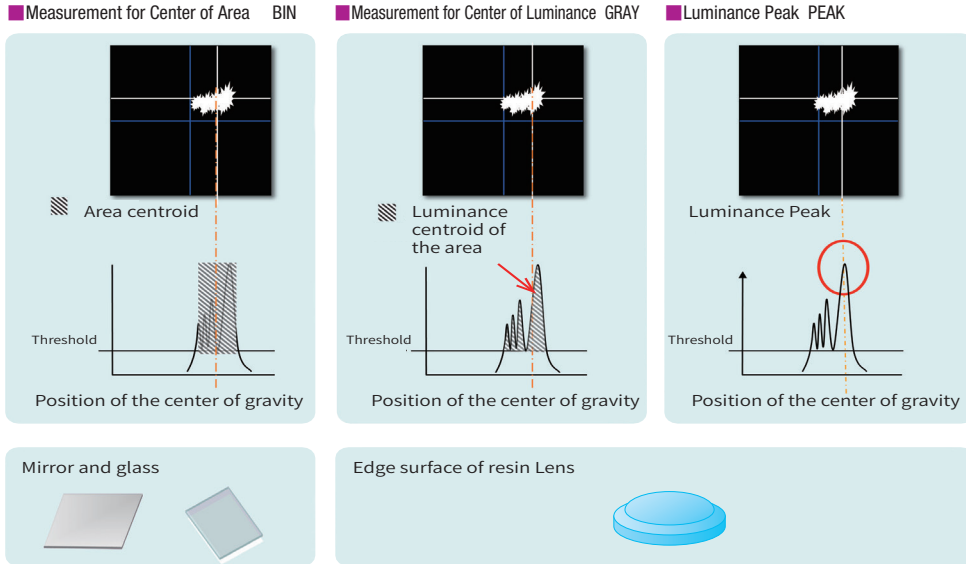
Laser Autocollimator

Smart LAC Series Software : HPU

■ Various center of gravity analysis

Three types of spot center-of-gravity analysis modes are available for more accurate measurements.

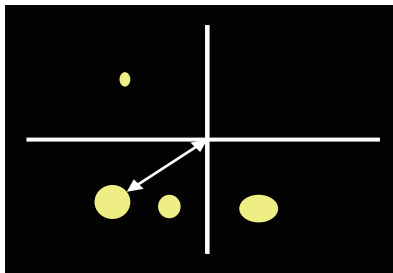
The center of area is suitable for specular reflectors with high flatness precision such as mirrors and glass, and the center of luminance is suitable for cases where reflection is distorted, such as the edge of a lens.



■ Single-spot measurement

Single-spot measurement is a method of measuring the reflected light from a specified point out of multiple reflected lights.

Single-spot measurement SINGLE



Angle measurement by specifying any one point from a maximum of 5 light points

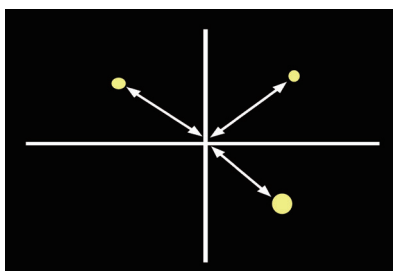
■ Multiple-spot measurement

Multiple-spot measurement can be selected from two types of measurement according to the purpose.

Multiple A: Measure each spot angle simultaneously

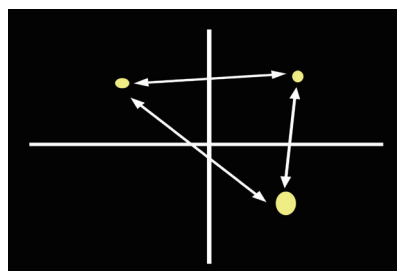
Multiple B: Measure relative angle between each spot simultaneously

Multiple-spot measurement MULTI A



Each spot angle measurement simultaneously

Multiple relative measurement MULTI B



Relative angle measurement between each spot simultaneously

New

Tilt Measurement

Laser Autocollimator

High Speed and High Resolution

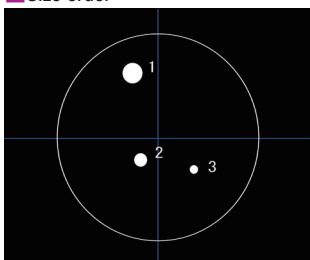
General Purpose

Accessories

■ Labeling Function

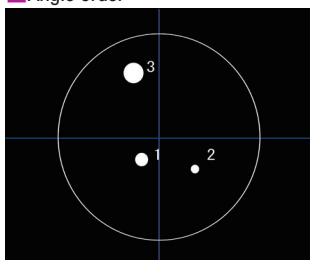
Each spot can be labeled when measuring multiple reflectors. Select a mode for labeling by size order or labeling by angle order.

■ Size order



Identify spots size automatically and label them in increasing order.

■ Angle order

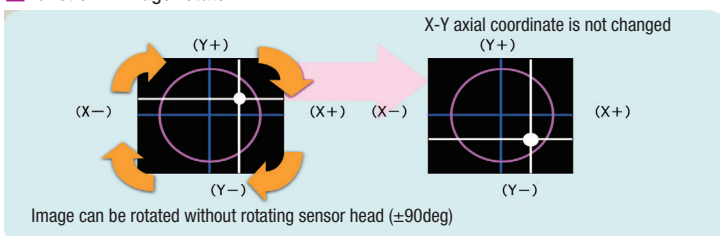


Identify spots angle automatically and label them in increasing order.

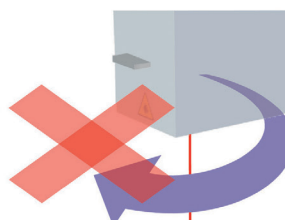
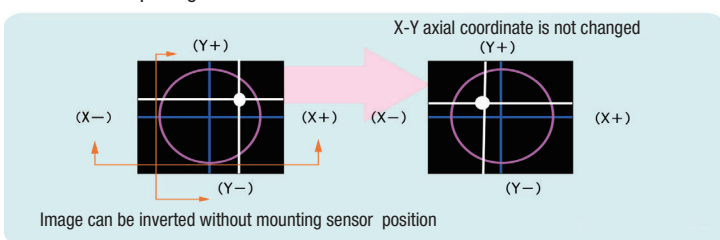
Center of gravity analysis	Sorting	Single Spot Measurement	Multiple Spot Measurement
Center of Area (BIN)	Angle Ascending order	○	○
	Size Descending order	○	○
Center of Luminance (GRAY)	Angle Ascending order	○	○
	Size Descending order	○	○
Peak Top (PEAK)	Max. Luminance point	○	Not available

■ Convenient functions

■ Function 1 Image rotate

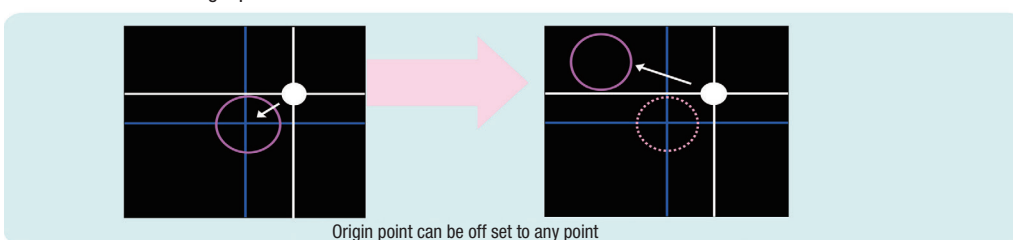


■ Function 2 Flip image

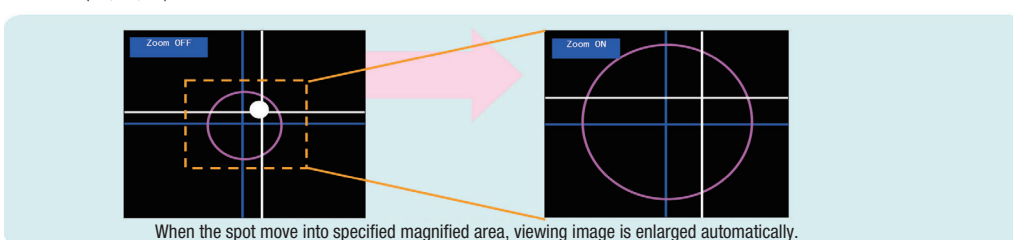


Without changing sensor mounting position or angle, the viewing image can be changed by the function.

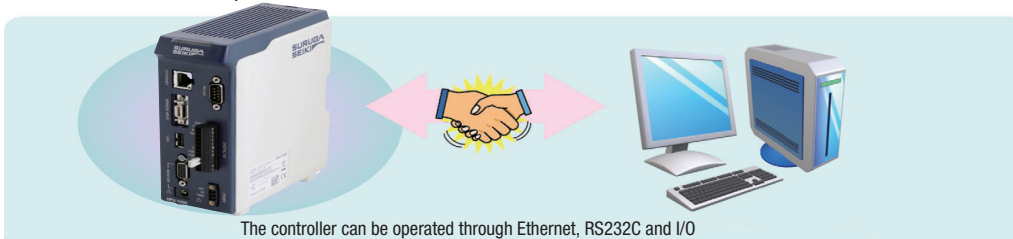
■ Function 3 Off set origin point



■ ZOOM (x2,X4,X8)



■ External communication port



Smart LAC Series Specification

NOTE

Please note that part of the specifications of this product may be changed without prior notice in order to improve its performance.

■ Sensor Head

Item		SPEC			
Model		H410-175R	H410-175S1	H410-175G1	H410-175B1
Specifications		$\pm 0.50\text{deg}$ at W.D. 0~300mm $\pm 1.00\text{deg}$ at W.D. 0~200mm $\pm 1.75\text{deg}$ at W.D. 0~120mm			
Laser	Wavelength	655nm \pm 10nm	852nm \pm 10nm	520nm \pm 10nm	450nm \pm 10nm
	Power	0.39mW Class 1	0.78mW Class 1	0.39mW Class 1	0.39mW Class 1
	Output position	20 \pm 0.5mm at Reference surface 1 15 \pm 0.5mm at Reference surface 2			
	Out going angle	$\pm 0.05\text{deg}$			
External Laser	Power	Max 5mW : Note1			
	Incident position	Within Radius 7.5mm from center of lens			
	Incident angle	Within $\pm 3.5\text{deg}$ from center axial of lens.			
Laser Spot size		Appr. $\phi 1\text{mm}$			
Indicated resolution		1 sec			
Repeatability(Ave.)		1 sec			
Linearity(Ave.)		$\pm 0.2\%$ of Full Scale (W.D.=200mm, Full Scale $\pm 1.0\text{deg}$)	$\pm 0.4\%$ of Full Scale (W.D.=200mm, Full Scale $\pm 1.0\text{deg}$)		
Sampling speed		25mSec ~			
Operation display		LED(Green/Red)			
Environment	Ambient temp. for use	0~40deg			
	Ambient humid. for use	35~85% RH			
	Performance guarantee temperature	23 \pm 5deg			
	storage Temp.	-10~+60deg			
	Anti-vibration	Max 2G (X/Y/Z axial direction) at 10~500Hz			
Weight		Appr. 160g			

Note 1: Depending on Wavelength, beam size and power, ND filter may be needed for use.

Image Processing Unit

Item		SPEC
Model		HPU-500 (Note 1), HPU-1000
Adaptable number of sensor head		1 unit
Applicable Sensor Model		H410-175R, H410-175S1, H410-175G1, H410-175B1
Rating Power	Voltage	DC24V $\pm 10\%$ * : Include voltage ripple
	Current	1.8A or less
	Output	Sensor Head: 12V, 0.5A Touch Panel monitor: 12V, 0.5A
12-pole connector	Pin assign	Output1: Common ground Output2: Strobe output for judgment Output3: Output for judgment Output4: Trigger busy Input1: Common ground Input2: Hold signal input for the result Input3: Zero re-set Input4: Start trigger (24V) Input5: Laser on (+) Input6: Laser on (-) Input7: Start trigger (+5V) Input8: Start trigger (-5V)
	Output circuit for 2,3,4	NPN/PNP open drain output Withstand Voltage : Max 30V Maximum drive current : Max 50mA Residual Voltage Max 0.5V: Leak current : Max 0.1mA
	Input circuit for 2,3,4	NPN/PNP input voltage Max input voltage: 30V Input current : 2.3mA ON Voltage : Min 15V OFF Voltage : Max 2V
	Input circuit for 5(+) and 6(-)	Laser On (connect 5 and 6 pin: Non-voltage contact) Internal voltage : 5V Short-circuit current : 2mA Input condition for OFF(Open) : Over 10kOhm of Min 4V Input condition for ON(Short) : Max 0.5kOhm or Max 1V
	Input circuit for 7(+) and 8(-)	Start trigger condition (Rising edge detection for 5V system) Input voltage range : 0~5V Input current : 4mA at 5Voltage On voltage : Min 3.5V Off voltage : Max 1V
Monitor output	Video Output	Analog RGB
	Number of Pixel	1024x768 pixel
	Connector	D-sub 15pin
Serial input	USB	USB 2.0 Type A for Touch panel or Mouse
External communications	RS-232C	D-sub 9 pin (Cross cable) Baud rate : 9600,19200,38400,57800, 115200
	Ethernet	RJ-45 connector Transmission Method: 1000Base-T, 100Base-TX Communication Method: TCP/IP, Socket Data output, Control command input/output
Indicator		LED(Green/Red)
Environment condition	Operating Temperature range	0~40deg
	Operation humidity range	35~85% RH
	Storage Temperature	-10~60deg
	Anti-vibration	Max. 2G X/Y/Z axial direction at 10-500Hz
Weight		Appr. 900g

Note: HPU-500 is not sold standalone, Please order HPU-500 with sensor head.