

High resolution BGS sensor

FASTUS BGS-HDL Series

BGS-HDL05T □
BGS-HDL25T □ □

Instruction manual

- Thank you for purchasing BGS-HDL series. We hope you are satisfied with its performance.
- Please read this manual carefully and keep it for future reference.

Specifications

Part number legend

BGS-HDL

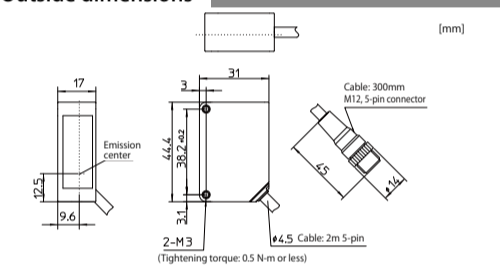
- Laser Class: (none) : Class 1, 2 : Class 2
- Connect type: (none) : Cable, M12 : M12 Connector*
- Max. working distance (cm) : *
- Make-to-Order

Type	2m cable	BGS-HDL05T	BGS-HDL25T
Connector type		BGS-HDL05T M12	BGS-HDL25T M12
Detection range		20 ~ 50mm	50 ~ 250mm
Repeat accuracy		0.01mm (Display: 0.01)	0.1mm (Display: 0.1) *1
Min. detection step *2		0.08mm	0.8mm
Temperature Drift (typ.)		± 0.04%/°C of F.S.	± 0.08%/°C of F.S.
Light source		Red laser diode (Wave length: 655nm)	
Type (Wavelength)		Variable within 8 μ s - 4ms	
Pulse duration		Variable within 250 Hz - 2kHz	
Repetition		390 μW	
Maximum output		1mW	
Laser class		CLASS 1 (IEC/JIS/FDA *3)	CLASS 2 (IEC/JIS/FDA *3)
Spot size *4		φ 0.8 mm	φ 1 mm
Response time		Min: 1.5ms @ Default: 1.5-7ms	Min: 1.5ms @ Default: 3-14ms
Hysteresis		0-22.49 (Default: 0.15)	0-0149.9 (Default: 1.0)
Detection range adjustment		Selectable from two methods, Teaching type / Target mode and Background mode used with manual adjustment	
Indicator		Laser radiation emission indicator: Green Output1 Indicator, Output2 Indicator (Orange)	
Display		7-segment 4-digit LED display	
Control output		NPN/PNP Open Collector (Selectable Functions) 2 system × 50mA max./24VDC Residual voltage: 1.8V	
Output mode		Light ON / Dark ON / ZONE / FGS, Selectable by setting	
Timer function		OFF / On delay / Off delay / One shot, Selectable by setting (Unit: ms)	
Connection		Cable type: 2m cable, φ 4.5 Connector type: M12, 5-pin connector 300 mm	
External input mode		Input (Gray) Laser OFF (No. O, N/C)/ Teach / Sample hold / One shot, Selectable by setting	
External input mode (No.2 output/Teach input) *5		Teach input selectable by setting Alternative with No.2 output.	
Supply voltage		12-24 VDC including 10% ripple (p-p)	
Current consumption *6		40mA max. / 24VDC excluding the current of Control Output	
Protection circuit		Reverse connection protection, Overcurrent protection	
Protection Degree		IP67	
Operating Temp./Humid.		-10-45°C / 35-85% RH (without freezing or condensation)	
Storage Temp./Humid.		-20 ~ 60°C / 35 ~ 85% RH (without freezing or condensation)	
Ambient Illuminance		Incandescent lamp: 5.000 lx or less	
Vibration resistance		10-55Hz, Double amplitude 1.5mm, 2 hours in each X,Y,Z direction	
Shock resistance		500m/s ² (Approx. 50G) 3 times in each X,Y,Z direction	
Material		Case: Aluminum die - cast, Front cover: PPSU, Display: PET, Cable: Oil proof PVC	
Applicable EMC Directive (2014/30/EU)		EMC Directive (2014/30/EU)	
Environment RoHS Directive (2011/65/EU), China RoHS (MIIT Order No. 32)		RoHS Directive (2011/65/EU), China RoHS (MIIT Order No. 32)	
Safety (excluding differences specified in Laser Notice No.50)		Safety (excluding differences specified in Laser Notice No.50)	
Applicable standards EN 60947-5-2:2007 / A1:2012, IEC 60825-1:2007		EN 60947-5-2:2007 / A1:2012, IEC 60825-1:2007	
Mass		Approx. 90g (Cable type) / Approx. 30g (M12 Connector type)	

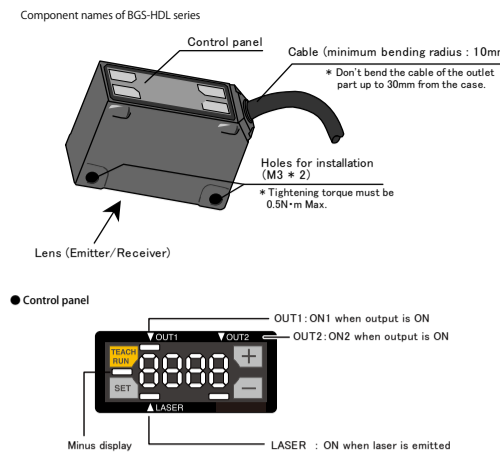
The specifications are based on the following conditions unless otherwise designated:
Ambient temperature: 23°C (Normal temperature), Power voltage 24 VDC, Sampling interval: 500 μs, Averaging: 512 times, Measuring distance: Center of measurement range (BGS-HDL05T: 35mm, BGS-HDL25T: 150mm), Measuring object: Our standard work (white ceramic plate)

- Sampling period: 1000 μs
- Hysteresis setting: 0.02 (BGS-HDL05T), 0.2 (BGS-HDL25T)
- In accordance with the FDA provisions of Laser Notice No. 50, the laser is classified as Class 1 or Class 2 per the IEC 60825-1 standard.
- Defined by light strength within 1/e² (13.5%) of spot center. There may be leak light at outside of the specified spot size. The sensor may be affected when there is a highly reflective object at that light area.
- Input Filter (Fixed): 8ms
- No. 1 output / No. 2 output load current are not included.

Outside dimensions

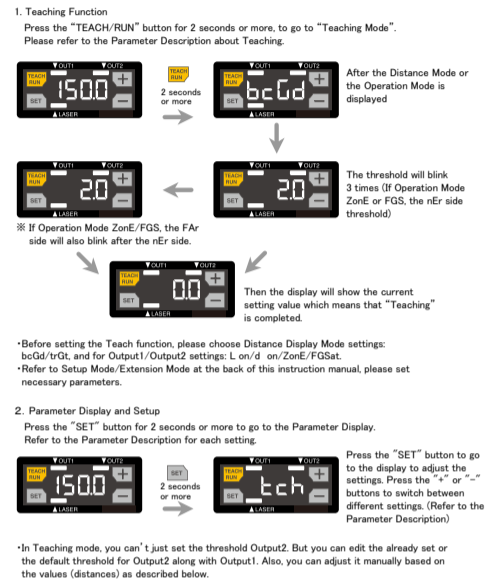


Functions of components



Basic operation

The following shows the basic operation and how to shift the screens of BGS-HDL series. Pressing the TEACH/RUN button less than 2 seconds will restore the Normal screen even in the Setup screen. Press the TEACH/RUN button less than 2 seconds even after setting is complete. When in Setup Mode or Threshold Adjustment Mode, if the button is not touched for 30 seconds the displayed/chosen parameter will be set, and the display will revert to Default Display.

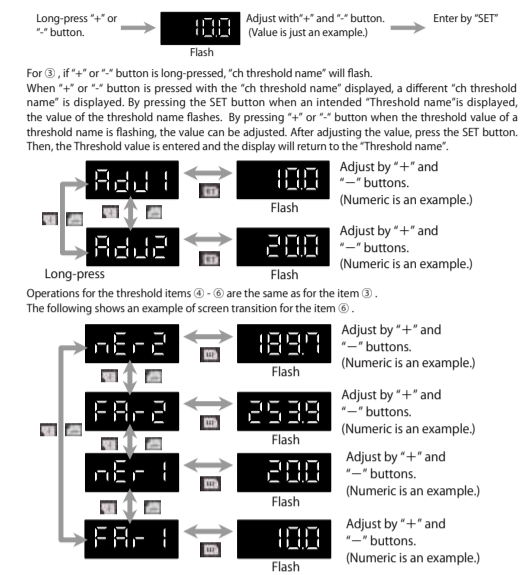


Functions of components

Component names of BGS-HDL series

1ch setting	2ch setting	1ch threshold name	1ch threshold name	2ch threshold name	2ch threshold name
① L/D on	tch	None	nEr	—	—
② Zone/FGS	tch	FAr	nEr	—	—
③ L/D on	L/D on	ADJ1	—	ADJ2	—
④ L/D on	Zone/FGS	ADJ1	—	FA2	nEr2
⑤ Zone/FGS	L/D on	FAr1	nEr1	ADJ2	—
⑥ Zone/FGS	Zone/FGS	FAr1	nEr1	FA2	nEr2

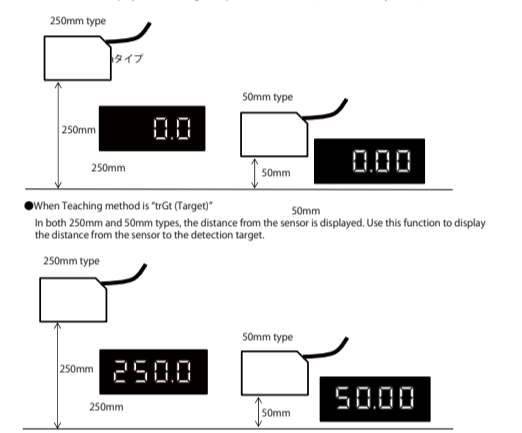
For ①, if "+" or "-" button is long-pressed, "Threshold name" will flash, and the value can be adjusted by pressing "+" or "-" button again. After adjusting the value, press the SET button. Then, the Threshold name is entered.



In any case, pressing the TEACH/RUN button after adjusting a threshold value will restore the Normal screen. Also, in all cases, if the TEACH/RUN button is pressed without pressing the SET button after the threshold value adjustment, the threshold value which is finally displayed is entered, and the screen returns to the normal screen.

Differences in display values depend on Distance Display Mode

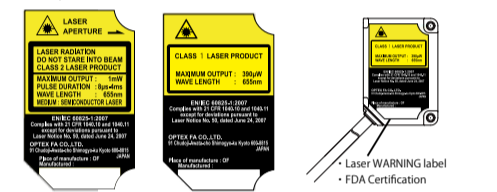
When Distance Display Mode is "bcGd (Background)"
The position 250 mm off the sensor is "0.0" for the 250mm type while the position 50 mm off the sensor is "0.0" for the 50 mm type.
(The distance will be 0.0 or 0.00 after Teaching)
The Numeric display will be in millimeters, up to one digit (two digits for 50 mm type). The value will become greater near the sensor.
This is a useful display for detecting workpieces on surfaces. (ex. on a conveyor belt)



Precautions for using laser

This product emits visible light laser beam and is in the category of Class 1 or Class 2 in IEC 60825-1 Laser Safety standard. A label along the requirements of the standard is affixed or attached to the product.

Regulations in the USA
When exporting laser devices to the USA, the USA laser control, FDA (Food and Drug Administration) is applied. This product has been already reported to CDRH (Center for Devices and Radiological Health). For details, contact our customer service.

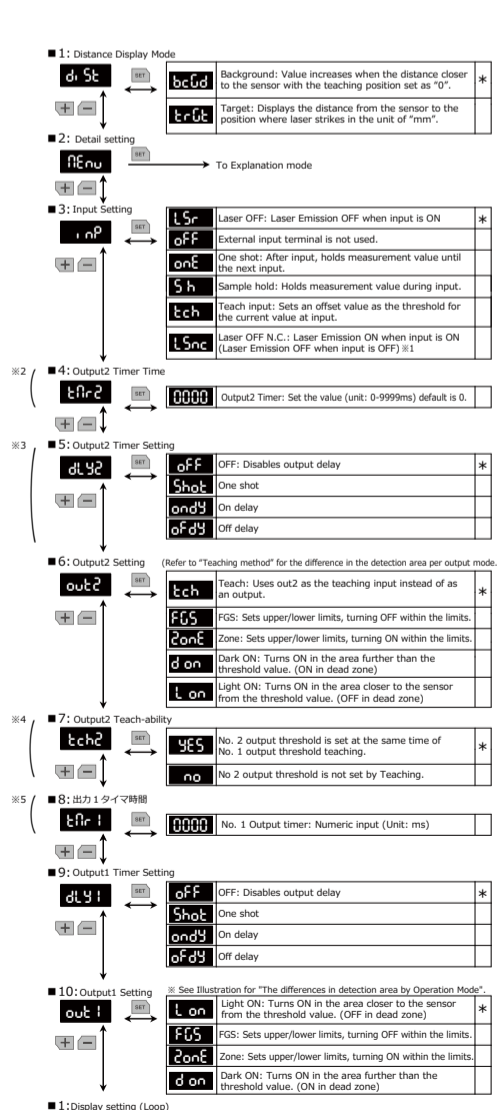


Included Items

- Please confirm following goods bundled in the box.
- BGS-HDL □ □
 - This instruction manual
 - Mounting screws M3 × 15-2pcs
 - Bracket
 - Laser WARNING label

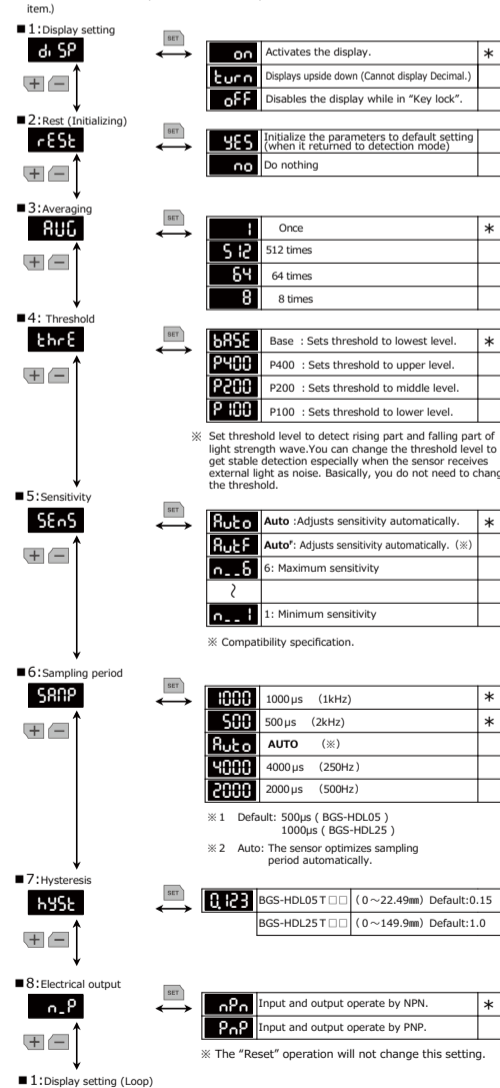
Setup Mode

The following shows the order to display the setting items when "+" button is pressed. The order will reverse when "+" button is pressed. (* shows the default of each setting item.)



Extension Mode

Select "Menu" in the Setup mode to enter the Explanation mode (* shows the default of each setting item.)

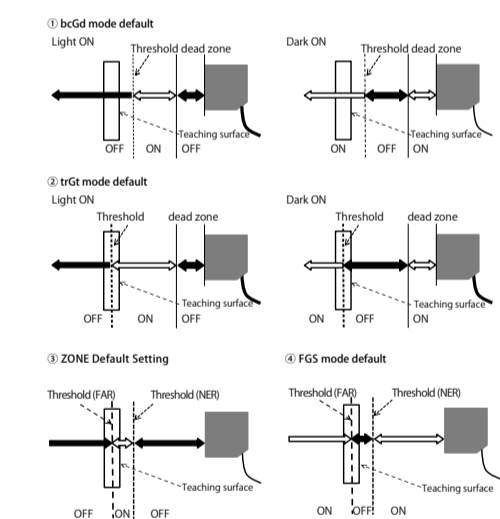


Other function

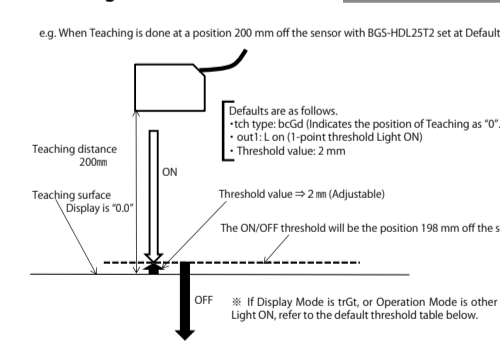
The following other function is provided.

- Keylock function**
 - Activating keylock: While it's RUN mode, press [Keylock] a time for 1 second or more. Then, [Keylock] will be shown. While Key lock is activated, any access except "Release Key lock" will be neglected. In the Setup mode, press [Keylock] to enter the Run mode.
 - Resetting keylock: While Key lock is activated, it will be released by pressing [Keylock] at a time for 3 seconds or more. Then, [Keylock] will be shown. After this process, keylock is released and every access will be accepted.

Operation Mode



Teaching distance and Default



Resetting threshold value

Output threshold (numeric) can be set freely. Teaching is done based on the threshold value set here. The following shows the defaults before changing. The values in paren. () show the defaults shown by the distance from the sensor.

BGS-HDL25 T □ □	Threshold default	Adj	FAr	nEr
bcGd mode	L on	2.0mm (248mm)	—	—
	Z on	2.0mm (248mm)	—	—
	FGS	—	2.0mm (252mm)	2.0mm (248mm)
trGt mode	L on	252mm	—	—
	Z on	252mm	—	—
	FGS	—	252mm	248mm

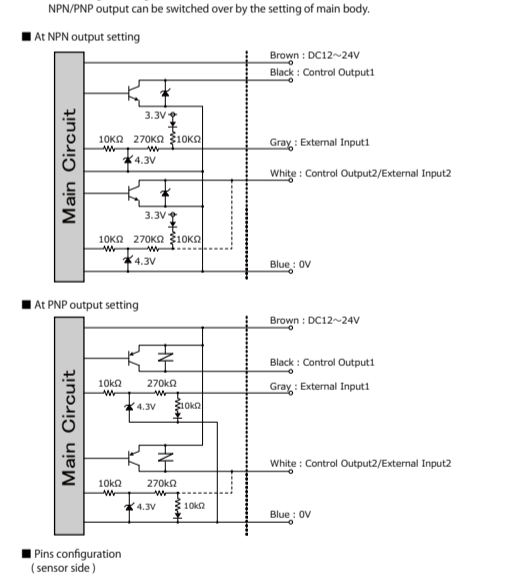
※ In bcGd mode, the value (in brackets) is the distance from the sensor.

BGS-HDL05 T □ □	Threshold default	Adj	FAr	nEr
bcGd mode	L on	0.5mm (49.5mm)	—	—
	Z on	0.5mm (49.5mm)	—	—
	FGS	—	0.5mm (50.5mm)	0.5mm (49.5mm)
trGt mode	L on	50.5mm	—	—
	Z on	50.5mm	—	—
	FGS	—	50.5mm	49.5mm

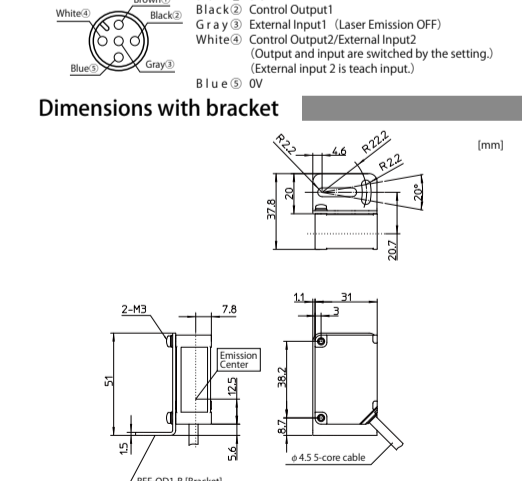
※ In bcGd mode, the value (in brackets) is the distance from the sensor.

Connection diagram

Circuit diagram of signal lines is as follows. NPN/PNP output can be switched over by the setting of main body.



Dimensions with bracket



Specifications and equipment are subject to change without any obligations on the part of manufacture.
For more information, questions and comments regarding products, please contact us below.
Our correspondence to China RoHS
Please see website below for our correspondence to China RoHS (Management Methods for Controlling Pollution by Electronic Information Products).
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Manufactured and sold by:
OPTEX FA CO.,LTD.

91 Chudoji-Awata-cho Shimogyo-ku Kyoto 600-8815 JAPAN
TEL : +81-(0)75-325-2920
FAX : +81-(0)75-325-2921
Website : http://www.optex-fa.com