DADISICK ®

TECHNICAL DATA SHEET

LASER DISPLACEMENT SENSOR
HIGH-PRECISION
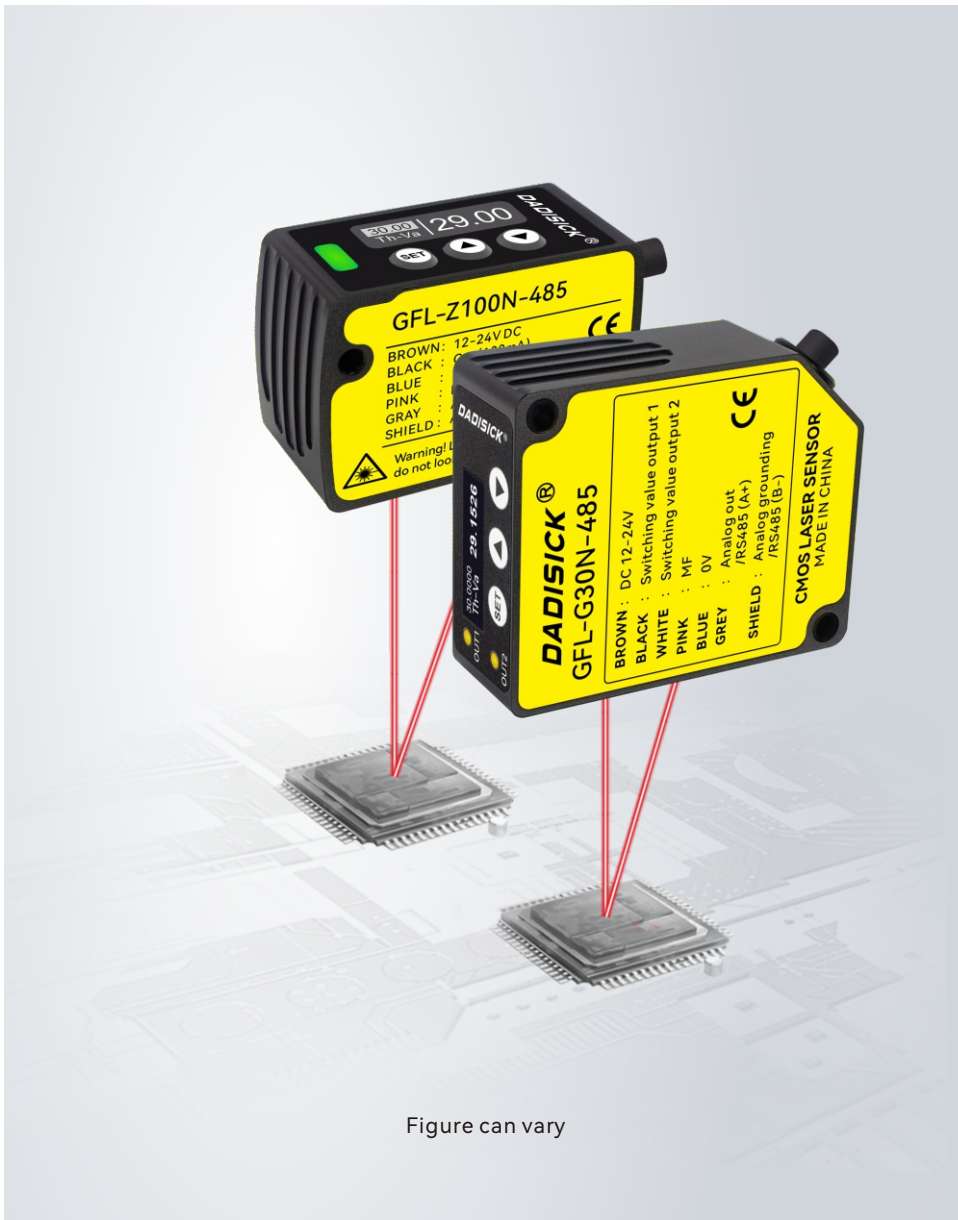## GFL-G series

Figure can vary

Contents

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GFL-G series

▍Product Features

◎ Resolution 2 μm.

◎ High precision laser displacement sensor.

◎ The measurement center distance is 85mm, and the detection range is ± 20mm.

◎ Small size, small light spot, multiple detection modes, high accuracy.

Applied the measurement principle of triangulation

When the position of the target changes, the incoming light position on the CMOS will move.
Determine the displacement of the target object by detecting the position of the incoming light.
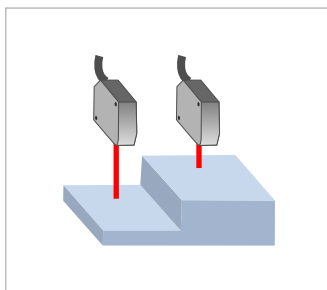
The detection angle needs to be perpendicular to the measured object within 90° ± 15°. Transparent objects cannot be detected, liquids cannot be detected, and the range cannot be calculated from 0.
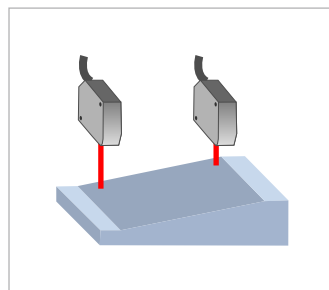
Target
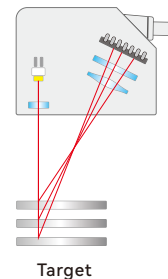
Application Scenario
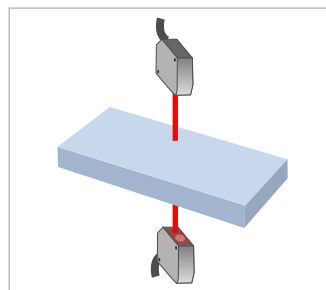
Measure displacement/flatness/height/thickness

①Height of measuring table   ②Multiple measuring slopes   ③Thickness measurement   ④Parallelism detection
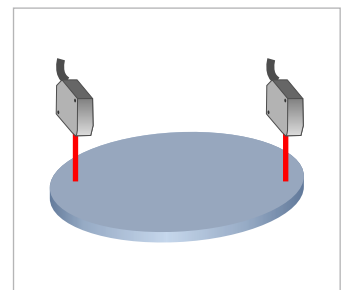
Multiple models available

Model	GFL-G30 Series	GFL-G50 Series	GFL-G85 Series	GFL-G120 Series	GFL-G250 Series
Detection distance	30mm	50mm	85mm	120mm	250mm
Detection range	±4mm	±10mm	±20mm	±60mm	±150mm
Resolving power	2um	5um	10um	30um	75um

measuring range: 24~34mm

GFL-G30 Series

measuring range: 40~60mm

GFL-G50 Series

measuring range: 65~105mm

GFL-G85 Series

measuring range: 60~180mm

GFL-G120 Series

measuring range: 100~400mm

GFL-G250 Series

| 0 | 50 | 100 | 150 | 200 | 250 | 300 |

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Product parameters table

species		Analog output	GFL-G30N(P)M	GFL-G50N(P)M	GFL-G85N(P)M	GFL-G120N(P)M	GFL-G250N(P)M
		RS485 output	GFL-G30N(P)-485	GFL-G50N(P)-485	GFL-G85N(P)-485	GFL-G120N(P)-485	GFL-G250N(P)-485
Detection distance			30mm	50mm	85mm	120mm	250mm
Detection range (f. s.)			±4mm	±10mm	±20mm	±60mm	±150mm
Light source			Red semiconductor laser				
			(Wavelength: 655nm, maximum output power: 1mw)				
Laser type	IEC/JIS		class2				
	FDA		classll				
Spot size * 1	Close range		0.15×0.15mm	0.6×1.2mm	0.9×1.5mm	1.2×1.8mm	1.5×2.5mm
	Center position		0.1×0.1mm	0.5×1.0mm	0.75×1.25mm	1.0×1.5mm	1.75×3.5mm
	Remote		0.15×0.15mm	0.4×0.9mm	0.6×1.0mm	0.5×0.8mm	2.0×4.5mm
Linear accuracy			±0.1%f.s. (f.s.=8mm)	±0.1%f.5. (f.s.=20mm)	±0.1%f.8. (f.s.=40mm)	±0.1%f.s. (f.s.=120mm)	±0,3%f.s. (f.s.=300nm)
Resolution ratio			2um (In fast mode 4μm)	5um (In fast mode 8μm)	10um (In fast mode 15μm)	30μm (In fast mode 45μm)	75μm (In fast mode 150μm)
Response time * 2	Quick mode		Max.2ms: average sampling frequency 1 time (1ms)+sensitivity switching time (max.1ms)				max.2.5ms
	Standard mode		Max.11.5ms: average sampling frequency 16 times (8.5ms)+sensitivity switching time (max.3ms)				max.15.5ms
	High resolution mode		Max.36.5ms; Average sampling frequency 64 times (32.5ms)+sensitivity switching time (max. 4ms)				max.48.5ms
Sampling period			※ Factory value: 500 μs (250mm type: 750 μs)				
Temperature drift characteristics			±0.08%F.S./℃				
Pilot lamp	Distance indicator light		LED light display on the operation panel				
	Output indicator light		When in the ON state: Q1 and Q2 indicator lights (orange) are on				
MF input (multifunctional input)			Select from the external input menu: zero adjustment, teach, stop laser.				
			NPN model: The grey MF wire is connected to the negative pole (0V) of the power supply and disconnected for more than 20ms, which is considered to trigger once.				
			PNP model: The grey M-line is connected to the positive pole (24V) of the power supply and disconnected for more than 20ms, which is considered as triggering once.				
Protection circuit			Reverse connection protection, overcurrent protection				
Protection level			IP64				
Operating environment temperature /humidity			–10~+45 ℃ (no icing)/35~85RH (no frost)				
Storage environment temperature /humidity			–20~60 ℃ (no icing)/35~95RH (no frost)				
Environmental illumination			Sunlight; Incandescent lamps below 10000lx; Below 3000lx				
Vibration resistance			10~55Hz dual amplitude 1.5mm, 2 hours in x, y, z directions				
Impact resistance			Approximately 50G (500m/s^2) X. 3 times in each direction of Y and Z				
Internal circuit stability time			About 1.5s				
Preheating time			Max. 15 minutes				
Material quality			Shell: aluminum alloy lens: PMMA				
Weight	Cable type		65g(Excluding cable lines)				
	Plug-in type		90g				

<Test conditions>
The test conditions without special designation are: ambient temperature: 23℃ (normal temperature), power supply voltage: DC24Ｖ, response time: high-resolution mode, sampling period: 550μs, detection distance: center position, test target: 50 ×50mm white ceramic.
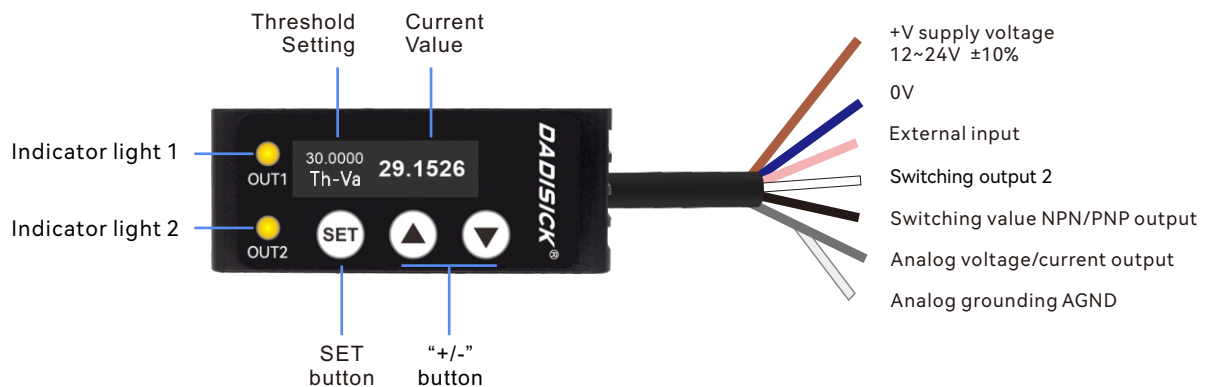*1 Defined by 1/e2 (13.5%) of the center beam intensity. When there is light leakage outside the defined spot size range, or there is an object with a higher reflectivity than the object being measured around the beam, false detection may occur.

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Output specifications

Model		Analog current output type	Analog voltage	RS485 comm
		GFL-G-①	GFL-G-②	GFL-G-③
Supply voltage		DC12~24V (+10%/—5%)	DC18~24V (+10%/—5%)	DC12~24V (+10%/—5%)
Consumption current		Max 60mA with analog output value	Max 40mA	
Output	Switching output 1	NPN/PNP max 100mA/DC30V residual voltage 18V		—
	Switching output 2	NPN/PNP max 100mA/DC30V residual voltage 18V		
	Analog output	4-20mA Load impedance: below 300 Ω	0-10V Output impedance: 100 Ω	—
Communication		—		RS485
Connection type	Cable type*3	φ5 6-core 2-meter long cable (PVC) AWG24		φ5 8-core 2-meter cable (PVC) AWG24

Circuit wiring diagram

Threshold Setting
Current Value
Indicator light 1
Indicator light 2
OUT1
OUT2
SET button
"+/-" button

+V supply voltage 12~24V ±10%
0V
External input
Switching output 2
Switching value NPN/PNP output
Analog voltage/current output
Analog grounding AGND

MF input (multi-function input)

Select in the menu external input: zero, teach, stop laser.
NPN model: The gray MF wire is connected to the negative pole of the power supply (0V) and is disconnected after more than 20ms to trigger once.
PNP model: The gray MF wire is connected to the positive pole of the power supply (24) and is disconnected for more than 20ms to trigger once.

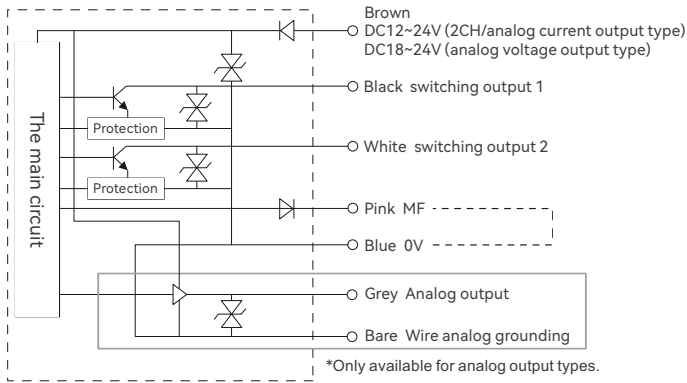Note 1. Please confirm whether the wiring is correct before turning on the power.
Pay special attention to the fact that the white wire (analog output wire) cannot touch other wires.

Note 2. The blue wire (0V) and the shielded wire (analog ground) are connected in the internal circuit.
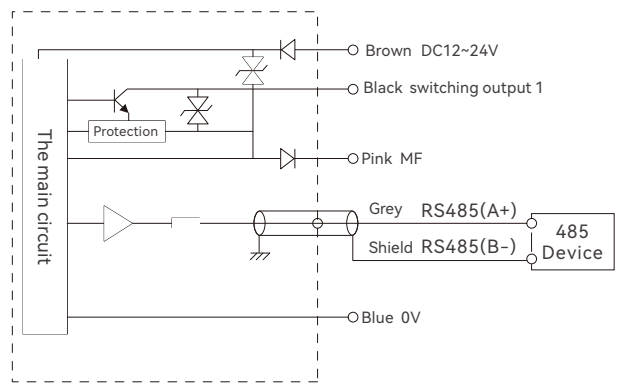But please use the blue wire (0V) to connect the negative pole of the power supply, and the shielded wire (analog ground) for the analog output.
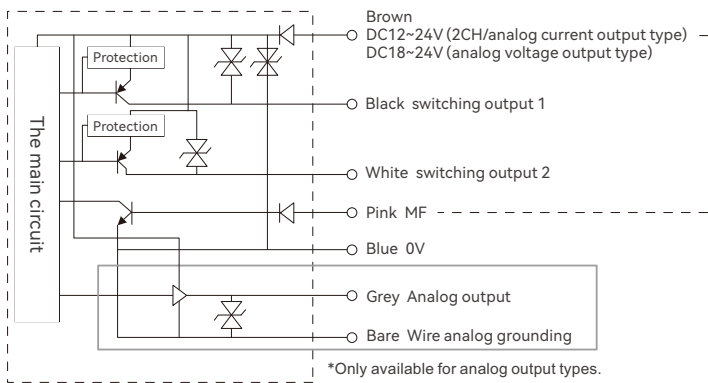
Output circuit
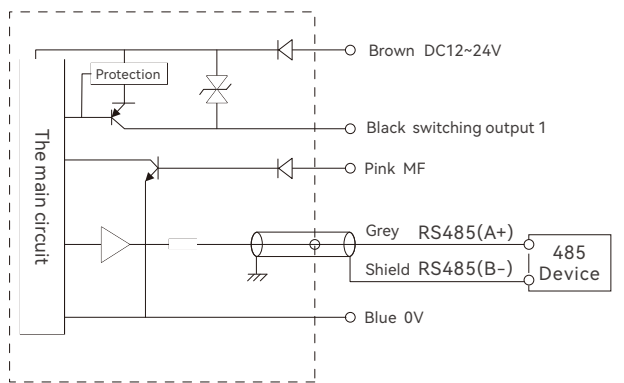
NPN type (current/voltage/dual switching output type)

The main circuit

Protection
Protection

Brown
DC12~24V (2CH/analog current output type)
DC18~24V (analog voltage output type)
Black switching output 1
White switching output 2
Pink MF
Blue 0V
Grey Analog output
Bare Wire analog grounding

*Only available for analog output types.

NPN type (RS485 communication type)

The main circuit

Protection

Brown DC12~24V
Black switching output 1
Pink MF
Grey RS485(A+)
Shield RS485(B-)
485 Device
Blue 0V

PNP type (current/voltage/dual switching output type)

The main circuit

Protection
Protection

Brown
DC12~24V (2CH/analog current output type)
DC18~24V (analog voltage output type)
Black switching output 1
White switching output 2
Pink MF
Blue 0V
Grey Analog output
Bare Wire analog grounding

*Only available for analog output types.

PNP type (RS485 communication type)

The main circuit

Protection

Brown DC12~24V
Black switching output 1
Pink MF
Grey RS485(A+)
Shield RS485(B-)
485 Device
Blue 0V

Size parameter

20.4
Laser emission window
Laser receiving window
47.5
26
13.1

50
3.8
42.4
4.3
2xφ4.5
60
51.4

Unit: mm