

TECHNICAL DATA SHEET

LASER DISPLACEMENT SENSOR HIGH-PRECISION GFL-G series

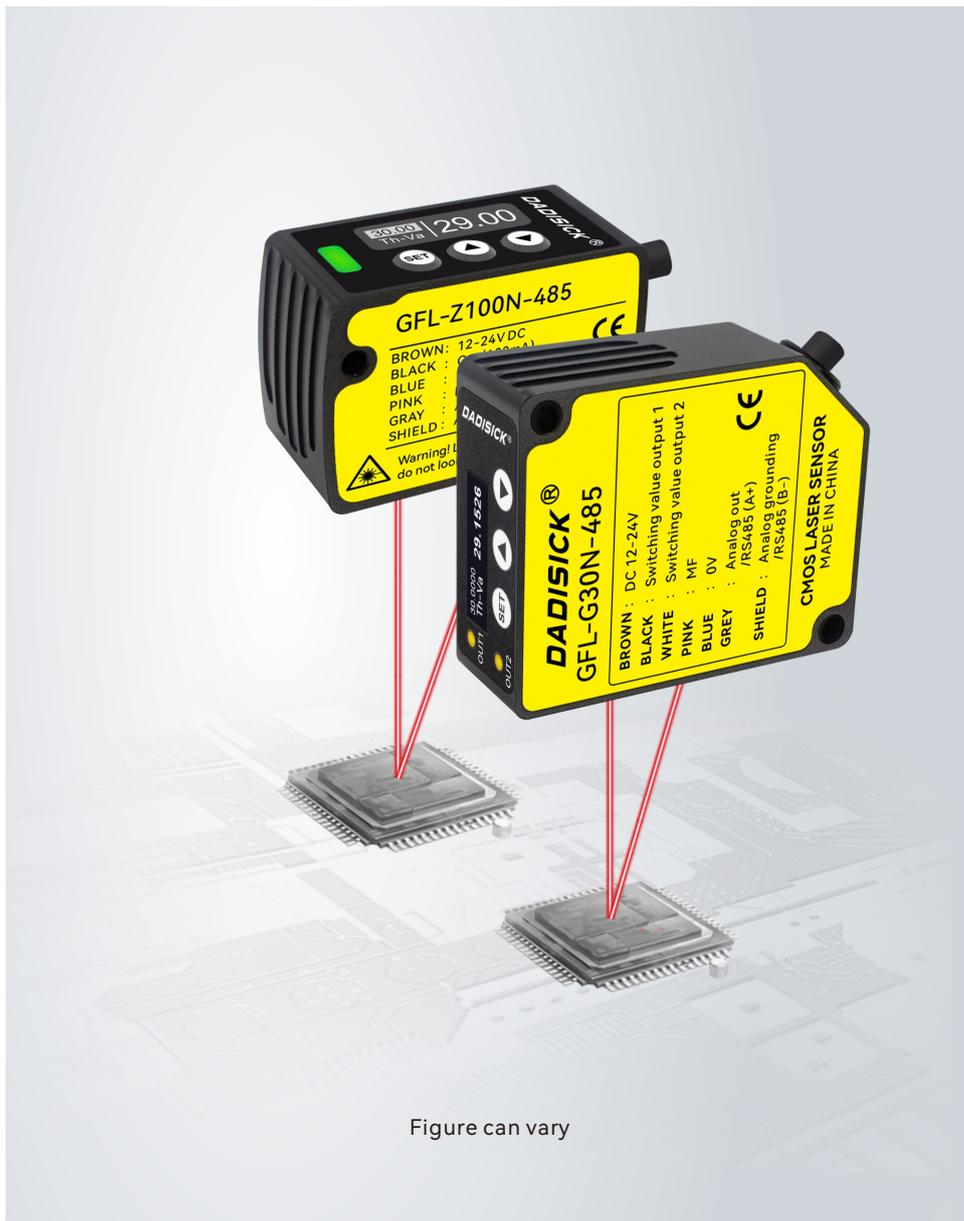


Figure can vary

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GFL-G series

Product Features

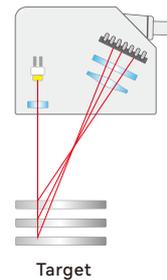
- ⊙ Resolution 2 μm .
- ⊙ High precision laser displacement sensor.
- ⊙ The measurement center distance is 85mm, and the detection range is $\pm 20\text{mm}$.
- ⊙ Small size, small light spot, multiple detection modes, high accuracy.

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.

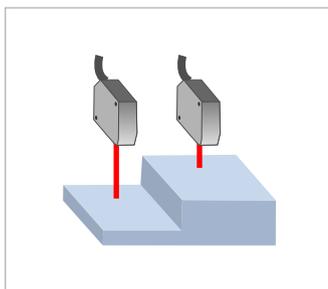


The detection angle needs to be perpendicular to the measured object within $90^\circ \pm 15^\circ$. Transparent objects cannot be detected, liquids cannot be detected, and the range cannot be calculated from 0.

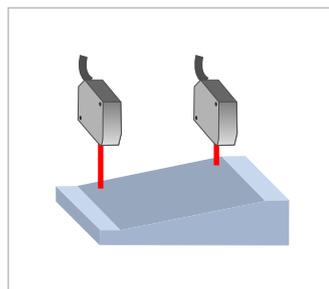


Application Scenario

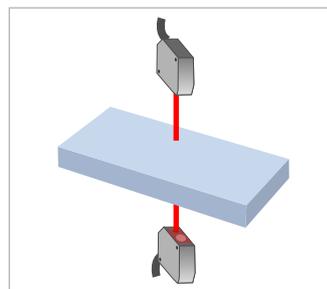
Measure displacement/flatness/height/thickness



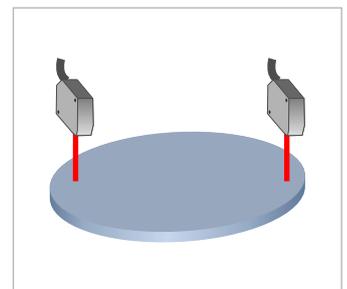
① Height of measuring table



② Multiple measuring slopes



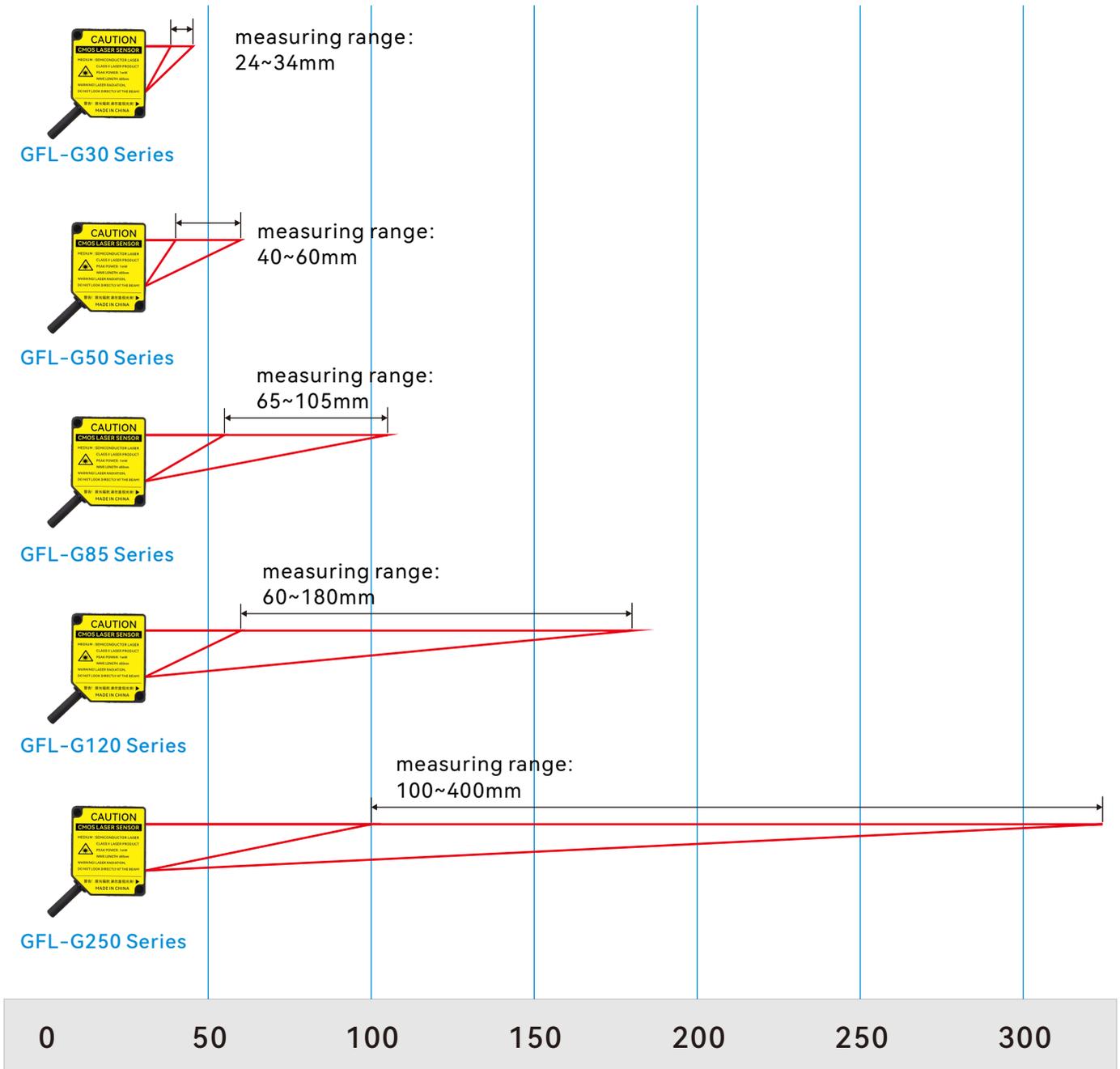
③ Thickness measurement



④ Parallelism 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



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	classII				
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		2μm (In fast mode 4μm)	5μm (In fast mode 8μm)	10μm (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./°C				
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 °C (no icing)/35~85RH (no frost)				
Storage environment temperature /humidity		-20~60 °C (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>

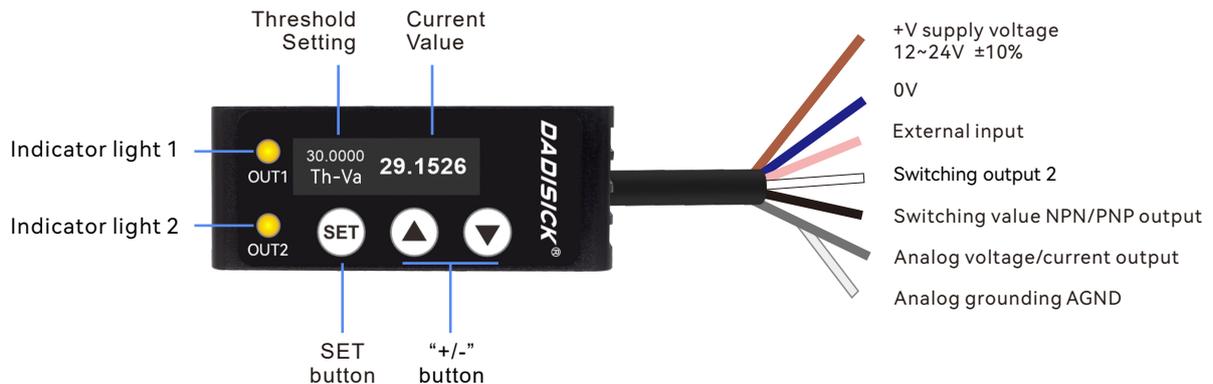
The test conditions without special designation are: ambient temperature: 23°C (normal temperature), power supply voltage: DC24V, response time: high-resolution mode, sampling period: 550μs, detection distance: center position, test target: 50×50mm white ceramic.

*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.

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	φ 5 6-core 2-meter long cable (PVC) AWG24		φ 5 8-core 2-meter cable (PVC) AWG24

Circuit wiring diagram



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.

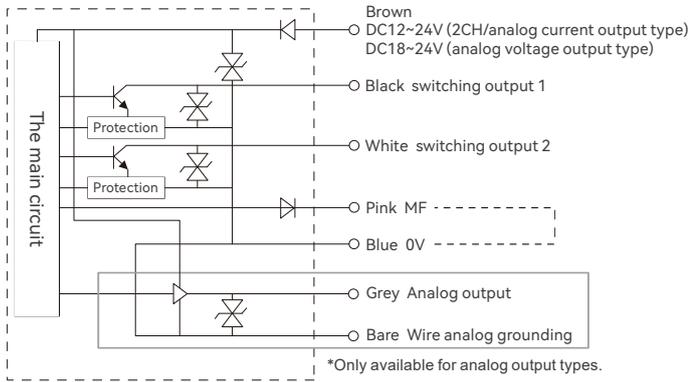
Pay special attention to the fact that the white wire (analog output wire) cannot touch other wires.

Note 2. The blue wire (0V) and the shielded wire (analog ground) are connected in the internal circuit.

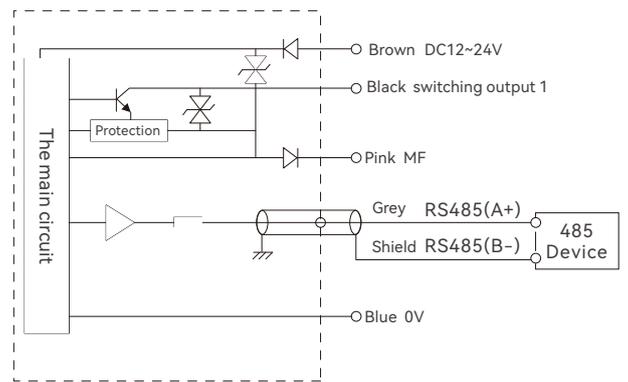
But please use the blue wire (0V) to connect the negative pole of the power supply, and the shielded wire (analog ground) for the analog output.

Output circuit

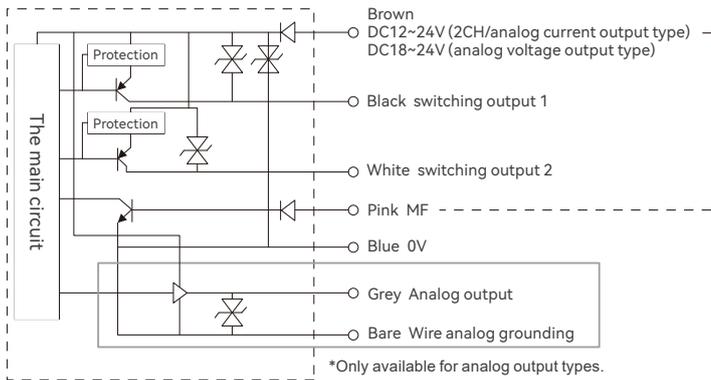
NPN type (current/voltage/dual switching output type)



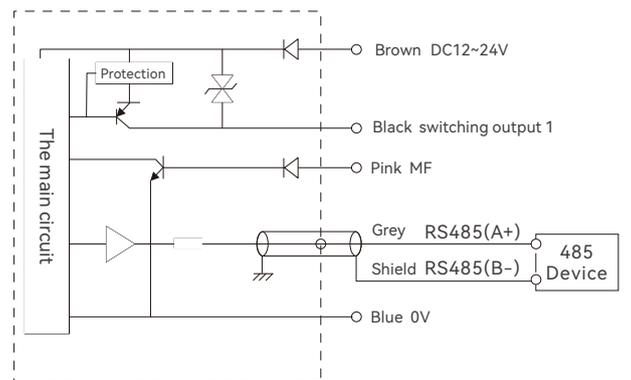
NPN type (RS485 communication type)



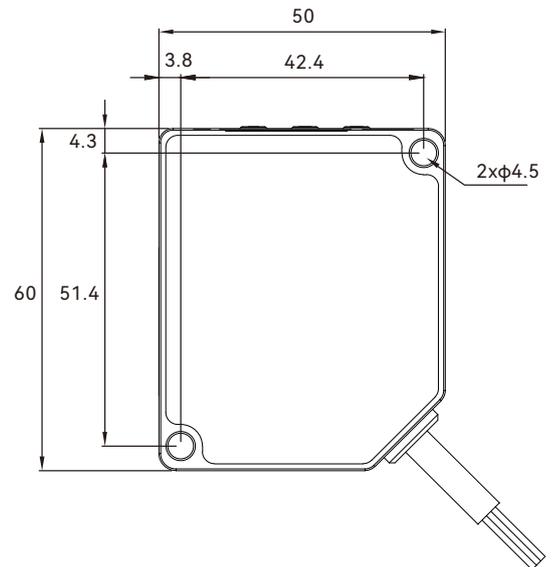
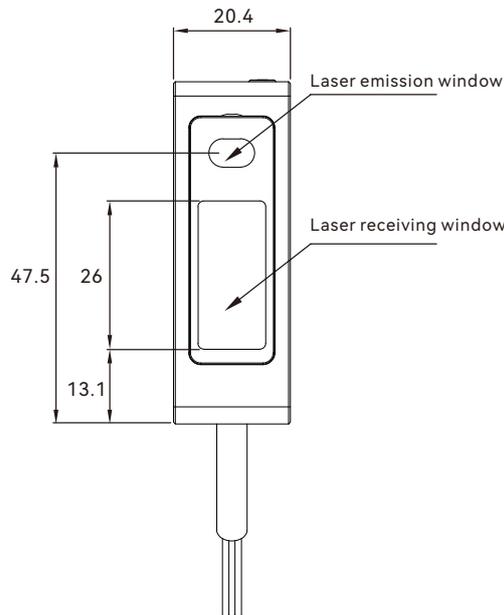
PNP type (current/voltage/dual switching output type)



PNP type (RS485 communication type)



Size parameter



Unit: mm