

Laser Displacement Sensor

GY3100

Features

- Triangulation-based, high-performance sensors enable fast, precise measurements.
- Supports different sensor heads for stable measurement on rough surfaces.
- Compact and versatile for various industrial settings.
- IP67-rated for dust and water resistance, with a durable design.
- Multiple I/O options enhance factory automation.
- Powerful software for easy setup and data analysis.

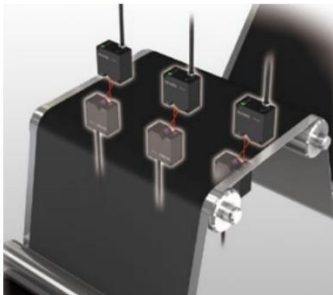
Description

The GY3100 is an online measurement system using triangulation to measure rough metal surface features. It employs mature optical design and advanced signal processing techniques, integrating Optosky's extensive experience in spectral analysis. Key features include high accuracy, fast speed, high repeatability, real-time non-destructive detection, cost-effectiveness, compact size, and easy installation. It is an ideal choice for precision material surface measurement in modern manufacturing.

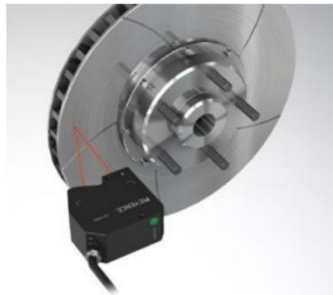
Application

- Measurement on rough surfaces like metal.

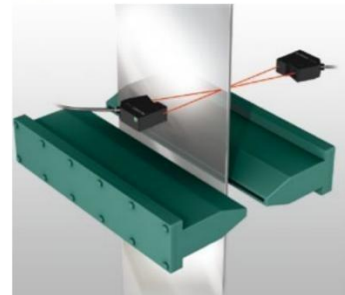
Measuring electrode thickness



Measuring the vibration of a disc motor



Position control of air knife



1. Principle

The GY3100 laser displacement sensor measures changes in an object's position, displacement, thickness, vibration, distance, and diameter with high precision and without contact. It uses the triangulation principle, making it ideal for high-precision, short-distance measurements.

(1) Measurement Process:

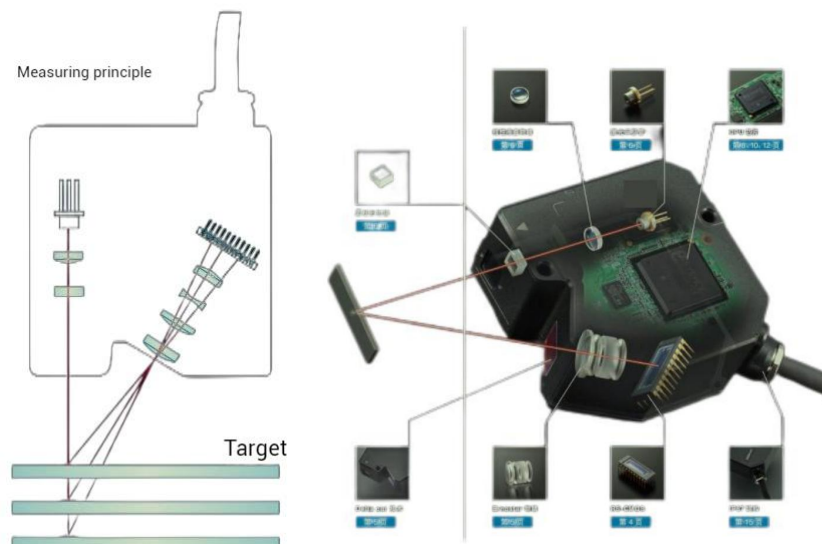
- A laser emitter projects visible red laser light onto the object's surface.
- The reflected light is captured by a receiver lens and detected by an internal CCD linear camera.
- Depending on the distance, the CCD camera can "see" the light spot from different angles.
- Using the angle and the known distance between the laser and camera, the digital signal processor calculates the distance between the sensor and the object.

(2) Signal Processing:

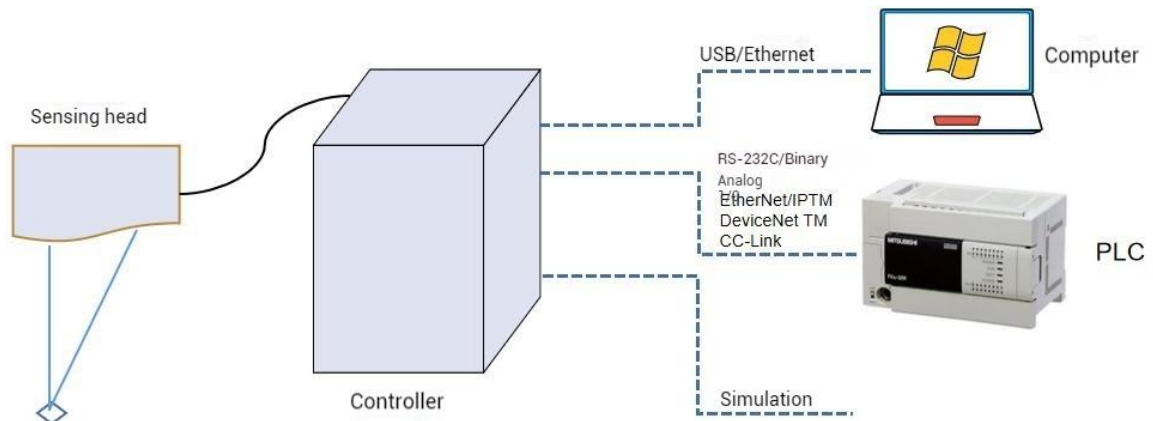
- The beam's position is processed through analog and digital circuits.
- A microprocessor analyzes the data and calculates the output values.
- The sensor outputs standard data signals proportional to the user-defined analog window.

(3) Components:

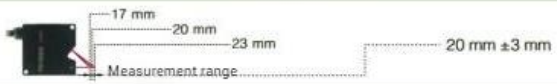
- Optical Sensor Head: Handles laser emission, signal collection, and photoelectric signal conversion.
- Controller: Manages electrical signal processing and I/O functions.
- Host Software: Facilitates device configuration and calibration.
- The GY3100 supports network expansion and integration with other industrial equipment, enhancing automation and smart manufacturing.



2. System Composition



3. Parameter

Sensor head						
Class 3A laser		Reference distance and measurement range			Repeat accuracy	Spot diameter
GY3100-20					0.02 μm	25 μm × 1400 μm
GY3100-50					0.025 μm	50 μm × 2000 μm
GY3100-80					0.1 μm	70 μm × 2500 μm
GY3100-150					0.25 μm	120 μm × 4200 μm
Model		GY3100-20	GY3100-50	GY3100-80	GY3100-150	
NO	Category					
1	Optical path principle		Diffuse	Diffuse	Diffuse	Diffuse
2	Reference distance		20mm	50mm	80mm	150mm
3	Measurement range		±3mm	±10mm	±18mm	±40mm
4	light source	Wavelength	655nm	655nm	655nm	655nm
5		Type	3A	3A	3A	3A
6		Power	4.8mW	4.8mW	4.8mW	4.8mW
7	Linearity (accuracy)		±0.02% F.S. (F.S. =6 mm)	±0.02% F.S. (F.S. =20 mm)	±0.02% F.S. (F.S. =36 mm)	±0.02% F.S. (F.S. =80 mm)
8	Light spot diameter		25um*1400um	50um*2000um	70um*2500um	120um*4200um
9	Repeat accuracy		0.02 μm	0.025 μm	0.1 μm	0.25 μm
10	Sampling frequency		2.55/5/10/20/50/100/200/500/1000μs(9 levels to choose from)			

11	LED indication		Laser Open			
12	Environmental characteristics	Temperature characteristics	0.01% F.S./°C (F.S. =6 mm)	0.01% F.S./°C (F.S. =20 mm)	0.01% F.S./°C (F.S. =36 mm)	0.01% F.S./°C (F.S. =80 mm)
13		Ambient light	Incandescent or fluorescent lamp: maximum 10000 lux			
14		Ambient humidity	Operating/Storage: 35~85% RH (no condensation)			
15		Ambient temperature	Operating: 0~+50°C,			
16		Protection level	IP67			
17		Vibration (durability)	10 to 55 Hz, 1.5mm double amplitude, 2 hours each in X, Y, and Z directions			
18		Shock (durability)	150m/s2, 6 directions, 3 times each (up and down, left and right, front and back)			
19	Material		Aluminum alloy			
20	Cable length		0.3 meters			
21	Weight		About 250g	About 260g	About 280g	About 300g
22	Installation method		suspended installation			
23	Reference size					
Controller						
Model			GY3100			
1	Input/output type		NPN/PNP universal			
2	Number of sensor head connections		2			
3	Applicable sensor heads		Compatible			
4	Display		Digital tube			
5	External Interface	Ethernet	100BASE-TX/10BASE-T no protocol (TCP/UDP), EtherNet/IP, RJ45			
6		RS-232C	Baud rate: 9600 to 115200 bps			
			Data length: 8 bits Stop length: 1 bit Parity: None/Even/Odd			
7		USB	USB2.0 High-speed compatible			
8		EtherNet/IP interface	(Explicit information), UCMM and Class 3 Number of connections 32 Support Conformance Test Version.CT14			
9		PLC link	The device supports Mitsubishi Electric's MELSEC iQ-R series, iQ-F series, Q series, L series, and FX series, but cannot be used simultaneously with EtherNet/IP™, CC-Link, or DeviceNet			
10		Analog output	Analog voltage output (OUTV): -10V~+10V, output impedance: 100Ω			
	Analog current output (OUTA): 4mA~20mA, maximum load resistance: 350Ω					
11	Key Features	Exposure time	Automatic/fixed			
12		Measurement cycle	200μs-400μs			
13		Material specification	Rough surface metal			
14		Filter processing	Median/average/differential/high pass/low pass/band pass			
15		Output	Scaling/various holds/zeroing/measurement value recording			
16		Display	Measured value/Threshold value/Analog output voltage value or current value/Judgment result/Resolution/Exposure time/Internal recording status/Peak light intensity			
17		System	Save/initialize/measurement information display/communication setting/sensor head calibration/key lock/zero storage/time input			

18		Measurement items	Height/Thickness/Operation
19	Rating	Power supply voltage	DC 24V
		Current consumption	0.6A or less when 1 sensor head is installed
20	Environmental characteristics	Protection level	/
21		Temperature range	When one or less sensor head expansion modules are connected: 0 to 50°C
			When two or more sensor head expansion modules are connected: 0 to 40°C
22		Humidity range	35 to 85%RH (non-condensing)
23	Material		Case
24	Dimensions		100mm*80mm*140mm
25	Weight		Less than
Accessories			
NO	Name		Quantity
1	Power adapter		DC24V, used to power the controller
2	Controller sensor head cable		1 meter as standard, customizable
3	Automation software		/
4	User manual		/