

Spectral Confocal Displacement Gauge

SM300

Features

- Utilizes white light confocal technology for accurate and stable measurements, supporting various materials and shapes simultaneously.
- Features a small light spot for clearer contour detection and higher measurement precision.
- Compact and lightweight design allows easy parallel installation in confined spaces, aiding in faster production cycles.
- Quick startup reduces design and adjustment time for extensive measures.
- Enables non-destructive, high-speed inspection, supporting mobile detection.

Description

The SM300 is an online measurement system that utilizes white light confocal technology to measure surface characteristics of various materials. It features an innovative optical design combined with advanced signal processing techniques and algorithms, incorporating years of spectral analysis expertise from Optosky. The system offers high measurement precision, fast speed, accurate results, compact size, near real-time and non-destructive detection, and easy installation and setup, making it the ideal choice for measuring surface characteristics in modern precision manufacturing.

Application

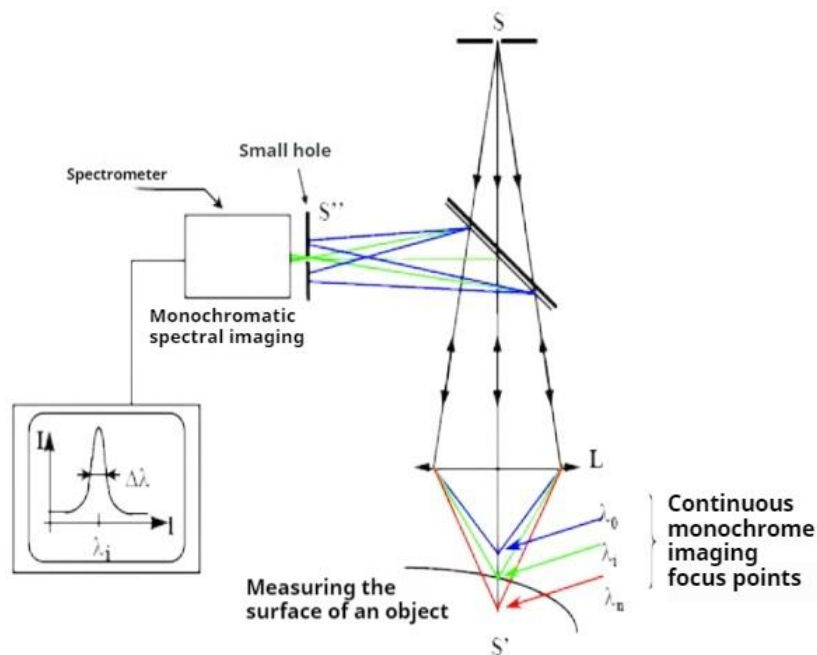
- **Smartphones:** Measures casing step heights, flatness, glass flatness, camera module travel, battery flatness, material thickness, LED shapes, connector coplanarity, assembly part height, frame width, and assembly level differences.
- **SEMI/FPD:** Measures wear patterns on target materials, wafer height, glass curvature, chip gaps, solder shapes, silicone shapes, and thin-film alignment.
- **Automotive Components:** Measures hole depth in metal parts, motor core thickness, part surface runout, sealant shapes, clutch friction material shapes, motor eccentricity, transmission flatness, and substrate assembly.
- **Pharmaceuticals:** Measures lens thickness, liquid levels in narrow containers, glass curvature, and relay contact actuation.



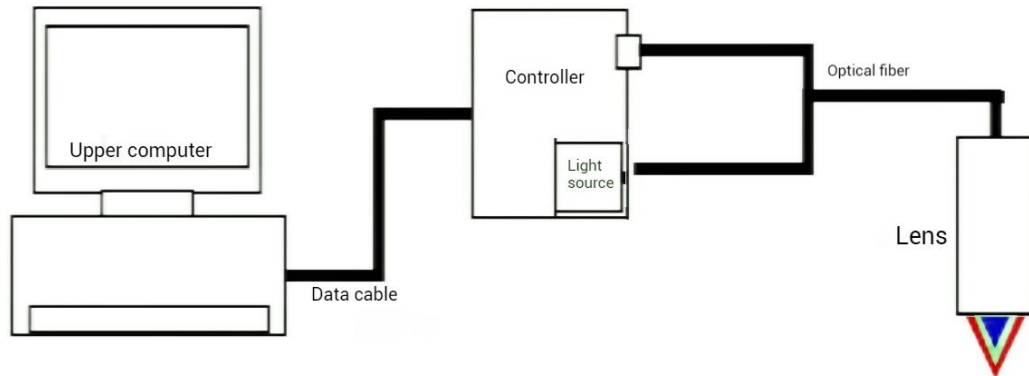
1. Principle

The principle of the SM300 Optical Fiber Coaxial Displacement Sensor is to change the collection position of white light according to its color (wavelength) and then irradiate it. Only the wavelength light at the focal point is used as the emitted light for detection, and the height is measured based on the color information. The light emission and detection are configured along the same axis, allowing for accurate measurement at any position within the measurement range through the same measurement point.

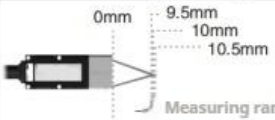
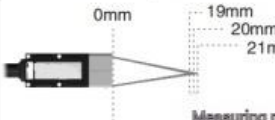
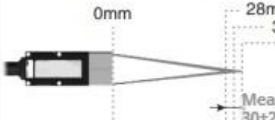
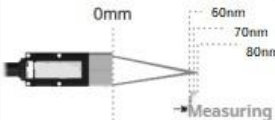
The SM300 mainly includes the sensor probe, controller, host computer setup software, and various accessories. The sensor with a non-electronic design provides optical emission and collection functions. The controller integrates the light source and spectrometer for photoelectric conversion and signal processing, while the host computer software allows users to debug and configure the equipment. To meet industrial production needs, the SM300 supports networking and interconnection with other industrial devices, further enhancing the level of industrial automation. The optical path principle of the SM300 is shown in the diagram below.



2. System Structure



3. Parameter

Shape	Measurement range	Spot diameter	Still resolution	Model
	 Measuring range 10±0.5mm	φ50μm	0.25μm	SM300-S10
	 Measuring range 20±1mm	φ70μm	0.25μm	SM300-S20
	 Measuring range 30±2mm	φ100μm	0.25μm	SM300-S30
	 Measuring range 70:10mm	φ500μm	0.25μm	SM300-S70

Sensor (Note: The conventional sensor model is SM300-S30, other models are customized)						
Model			SM300-S10	SM300-S20	SM300-S30	SM300-S70
NO.	Item					
1	Measurement center distance		10mm	20mm	30mm	70mm
2	Measurement range		±0.5mm	±1mm	±2mm	±10mm
3	Resolution		0.25um	0.25um	0.25um	0.25um
4	Accuracy		±0.5um	±1um	±2um	±5mm
5	Spot diameter		Φ50um	Φ70um	Φ100um	Φ500um
6	Measurement cycle		20us-400us			
7	Environmental characteristics	Ambient light	Surface illumination of the object is less than 30000Lx: Incandescent lamp			

8		Ambient humidity	Operation/storage: 35~85% RH (no condensation)			
9		Ambient temperature	Operation: 0~+50°C, Storage: -15~+60°C			
10		Shock (durability)	10~150Hz (single amplitude 0.35mm), 80 minutes in each direction of X/Y/Z			
11		Vibration (durability)	150m/s2, 6 directions, 3 times each (up and down, left and right, front and back)			
12	Temperature characteristics		0.6μm/°C	1.1μm/°C	1.8μm/°C	3μm/°C
13	Material		Box: Aluminum alloy Cable sheath: PVC			
14	Fiber length		0.3m (bending cable)			
15	Cable bending radius		20mm			
16	Weight		200g			
17	Installation method		Lifting 90°			
18	Reference size		35mm*101mm			
Controller						
Model			SM300			
1	Input and output type		NPN/PNP universal			
2	Number of sensor connections		1			
3	Applicable sensors		SM300-S10, SM300-S20, SM300-S30, SM300-S70			
4	Measurement light source		White LED			
5	Display		4-inch display			
6	LED display		Status indicator: HIGH (orange), PASS (green), LOW (orange), STABILITY (green), ZERO (green), ENABLE (green), RUN (green)			
7	External Interface	Ethernet	1000BASE-T/100BASE-TX/10BASE-T 无协议(TCP/UDP)、EtherNet/IP, RJ45			
8		RS-485	/			
9		Analog output	Analog voltage output (OUTV): -10V~+10V, output impedance: 100Ω			
10			Analog current output (OUTA): 4mA~20mA, maximum load resistance: 300Ω			
11		32-pole expansion connector	Judgment output (HIGH/PASS/LOW)			Transistor output mode: Output voltage: DC21.6~30V Load current: 50mA or less Residual voltage when ON: 2V or less Leakage current when OFF: 0.1mA or less
12			BUSY output (BUSY)			
13			Alarm output (ALARM)			
14			Enable output (ENABLE)			
15			Sinking flag output (SYNFLG)			
16			Stability output (STABILITY)			
17			Task status output (TASKSTAT)			DC input mode Input voltage: DC24V±10% (DC21.6~26.4V) Input current: 7mA Typ.
18			LIGHT OFF input (LIGHT OFF)			
19			Zero input (ZERO)			
20			Time input (TIMING)			
21		Reset input (RESET)				
22		Sinking input (SYNC) Synchronize and trigger				

			the same input	(DC24V) ON voltage/ON current: 19V/3mA or more OFF voltage/OFF current: 5V/1mA or less
23	Key Features	Exposure time	Auto/Fixed	
24		Measurement cycle	20μs~400μs	
25		Material specification	Standard/Mirror/Rough	
26		Filter processing	Median/Average/Differential/High Pass/Low Pass/Band Pass	
27		Output	Zoom/Various Holds/Zero Reset/Measurement Value Record	
28		Display	Measurement Value/Threshold/Analog Output Voltage or Current Value/Judgment Result/Resolution/Exposure Time/Internal Record Status/Peak Light Received	
29		System	Save/Initialize/Measurement Information Display/Communication Setting/Sensor Head Calibration/Key Lock/Zero Reset Storage/Time Input	
30		Measurement items	Height/Thickness/Displacement/	
31	Rating	Power supply voltage	DC 24V	
		Current consumption	1A or less	
		Insulation resistance	Between all wires and FG terminals: 20MΩ (250V megohmmeter)	
		Withstand voltage	Between all wires and FG terminals: AC500V, 50/60Hz, 1 minute	
32	Environmental characteristics	Protection level	/	
33		Vibration (durability)	10~55Hz (single amplitude 0.35mm), 50 minutes in each direction of X/Y/Z	
34		Shock (durability)	150m/s ² , 6 directions, 3 times each (up and down, left and right, front and back)	
35		Temperature range	Operating: 0~+40°C, Storage: -15~+60°C (no freezing, no condensation)	
36		Humidity range	Operating/Storage: 35~85%RH (no condensation)	
37	Grounding		D-type grounding (grounding resistance below 100Ω) * The third type of grounding in the past	
38	Material		Box: sheet metal	

39	Dimensions	148mm (length) × 214mm (width) × 246mm (height)	
40	Weight	2Kg	
Accessories			
NO.	Name	Description	Quantity
1	SMA095 fiber optic adapter	For fiber extension	1
2	Fiber optic cable	2m/5m/10m/20m/30m, connect sensors and controllers	1
3	RS-485 cable (optional)	2m, connect PC and PLC	2
4	Switching hub (optional)	3 ports	1
5	Automation software	/	1

4. Product Image

