

**OPTEX**  
**F A**

[www.optex-ramco.com](http://www.optex-ramco.com)



- Stand alone operation available using serial communication from the laser head
- Large assortment of laser head options including wide and narrow beam
- Specular mode option for polished surfaces and transparent thickness measurement
- Multi-function controller with data acquisition software

# High Performance Multi-Head Linear Image Laser Displacement Sensor

**CD5** series

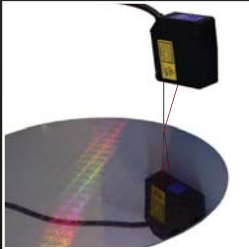
*Performance, Stability and Functionality*

## Typical Applications

- Thickness
- Warpage
- Flatness
- Level
- Eccentricity
- Depth

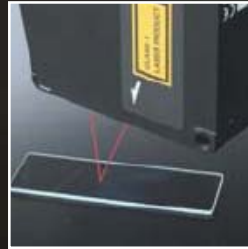
# CD5<sub>series</sub>

## High Performance Multi-Head Linear



**CD5-L25 (narrow beam)**  
**CD5-LW25 (wide beam)**

Distance: 25 ±1mm  
Resolution: 0.02µm  
Linearity: ±0.08% F.S.  
Specular mode



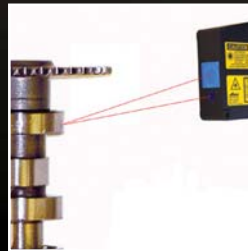
**CD5-30 (narrow beam)**  
**CD5-W30 (wide beam)**

Distance: 30 ±5mm  
Resolution: 0.2µm  
Linearity: ±0.08% F.S.  
Specular or Diffuse mode



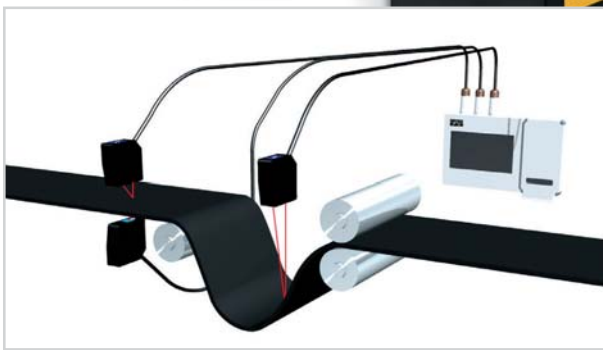
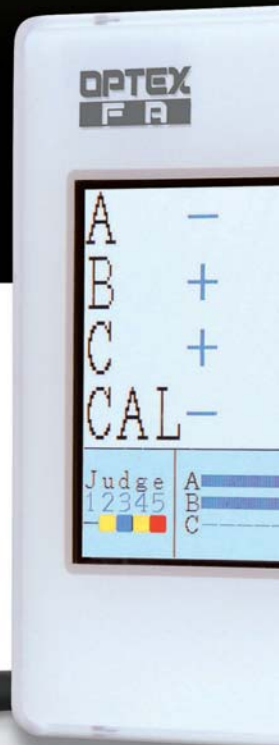
**CD5-85 (narrow beam)**  
**CD5-W85 (wide beam)**

Distance: 85 ±20mm  
Resolution: 1µm  
Linearity: ±0.05% F.S.  
Specular or Diffuse mode



**CD5-W350 (wide beam)**

Distance: 350 ±100mm  
Resolution: 5µm  
Linearity: ±0.08% F.S.  
Diffuse mode



Up to three laser heads can be connected to the controller. Any combination of sensing heads (type and/or sensing distance) can be used together. Each head can measure separately or be used in the calculation function for specific applications.

# Complete Selection of Sensor Heads Available

There are six different measurement ranges. The wide beam model is designed for use on rough or scratched surfaces. The narrow beam models are designed for measuring small targets or smooth surfaces.

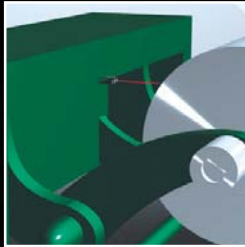
The 30mm and 85mm stand off models can be used in specular or diffuse modes. Specular mode can accurately measure thickness of transparent material and is also designed for measuring highly polished surfaces. Diffuse mode is for measuring all other materials.

## Image Laser Displacement Sensor



**CD5-W500 (wide beam)**

Distance: 500 ±200mm  
Resolution: 10µm  
Linearity: ±0.08% F.S.  
Diffuse mode



**CD5-W2000 (wide beam)**

Distance: 2000 ±1mm  
Resolution: 30µm  
Linearity: ±0.1% F.S.  
Diffuse mode



**Controller**

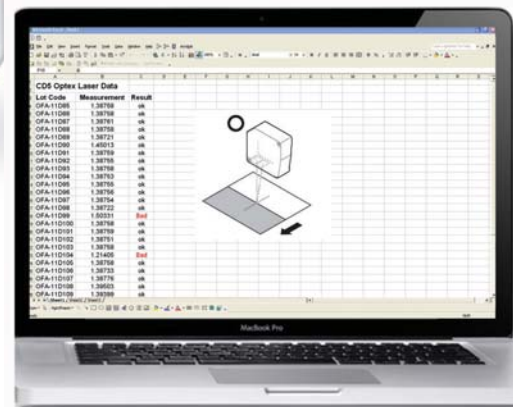
**CD5-AN (NPN)**  
**CD5-AP (PNP)**

### Independent Operation

Sensor heads can operate independently of the controller via RS422 serial communications allowing digital measurement data to be interfaced directly to a PLC or PC.

### Easy Setup and Operation

The multi-function controller has a large LCD display and 10-key input panel. Setup and monitoring is quick and easy. The reflected light waveform can be displayed on the controller.



# Specifications

Type	CD5-L25	CD5-LW25	CD5-30	CD5-W30	CD5-85	CD5-W85	CD5-W350	CD5-W500	CD5-W2000	
Optic Type	Specular		Specular/Diffuse Mode				Diffuse			
Measurement Distance	25mm		30mm		85mm		350mm	500mm	2000mm	
Measurement Range	±1mm		±5mm		±20mm		±100mm	±200mm	±500mm	
Light Source	W/L	650nm		650nm	658nm	650nm	658nm			
	Power	390µW		1mW				5mW		
Laser Class	FDA	CLASS II							CLASS IIIIR	
Spot Size	25x35µm	100x700µm	30x100µm	260x1000µm	70x290µm	260x1200µm	700x2400µm	1000x3700µm	2100x7800µm	
Linearity *1	±0.08%F.S. (F.S.=2mm)		±0.08%F.S. (F.S.=10mm)		±0.05%F.S. (F.S.=40mm)		±0.08%F.S. (F.S.=200mm)	±0.08%F.S. (F.S.=400mm)	±0.1%F.S. (F.S.=1000mm)	
Resolution *1	0.02µm		0.2µm		1µm		5µm	10µm	30µm	
Sampling Period *2	100µs						800µs			
Temperature Drift	±0.01%F.S./°C (F.S.=2mm)	±0.05%F.S./°C (F.S.=2mm)	±0.01%F.S./°C (F.S.=10mm)		±0.01%F.S./°C (F.S.=40mm)		±0.01%F.S./°C (F.S.=200mm)	±0.01%F.S./°C (F.S.=400mm)	±0.05%F.S./°C (F.S.=1000mm)	
Serial I/F	RS-422 9.6~1843.2kbps									
Supply Voltage	DC12~24V ±10% or from CD5A-□									
Power Consumption	Max. 45mA (DC24V)									
Indicator LED's	Laser Green: Laser is active									
	Measurement		Orange: Within +/- 5% of measurement distance center Red: Within measurement range, near side of center 5% Green: Within measurement range, far side of center 5% Red/Green alternating: Out of range							
Protection Category	IP67									
Operating Temp/Humid	-10~+50°C / 35~85%RH (no condensation)									
Storage Temp/Humid	-20~60°C / 35~85% RH (no condensation)									
Ambient Illuminance	Max. 3,000 lux (incandescent lamp)									
Vibration Resistance	10~55Hz / 1.5mm X,Y,Z 2 hours									
Shock Resistance	50G (500m/s <sup>2</sup> ) X,Y,Z 3 times									
Material	Housing: Aluminum diecast									
Cable	500mm length (can be extended to a maximum distance of 50 meters)									
Weight	Approx. 250g including 500mm cable								Approx. 450g	

**\*1. Conditions for this specification:**

**Temperature:** 23° C, Power Supply: 24VDC

**Sampling Period:** 100µs (CD5-W350/-W500/-W2000: 800µs)

**No. of averaging times:** 4096

**Target Object:** Aluminum vapor deposition mirror (specular type), white ceramic (diffuse type)

\*2. Default: CD-LW25/-W30/-W85: 100µs, CD5-W350/-W500/-W2000: 800µs

Go to [www.optex-ramco.com](http://www.optex-ramco.com) to download the 16-page CD5 brochure. The brochure contains a complete listing of specifications and features.

CD5A-N / CD5A-P	
Number of Heads	Up to 3
Supply Voltage	DC12 ~ 24V ±10% 350mA/24V
Temperature Drift	±0.01%F.S./°C
Interface	RS-232C/USB
Analog Output	+/- 10V / F.S. 3 total and 4 ~20mA / F.S. 3 total
Digital Outputs	3 Alarm outputs and 5 judgment outputs per bank
Inputs	4 bank select inputs (total 16 banks), zero reset inputs, hold inputs, laser off inputs
Display	4.3" TFT LCD
Protection Category	IP20
Operating Temp/Humid	-10~+50°C / 35~85%RH (no condensation)
Storage Temp/Humid	-20~+60°C / 35~85%RH (no condensation)
Vibration Resistance	10~55Hz / 1.5mm X,Y,Z 2 hours
Shock Resistance	20G (196m/s <sup>2</sup> ) X,Y,Z 3 times
Material	Case: Polycarbonate, Connection terminals: Nylon 66
Weight	Approx. 550g including connection terminals

Extension cables Sensor Head to Controller	
DSL-1212-G02M	2 meter length
DSL-1212-G05M	5 meter length

Extension cables Standalone Operation	
DOL-1212-G05M	5 meter length

CD5 Accessory sheet available at [www.optex-ramco.com](http://www.optex-ramco.com)

