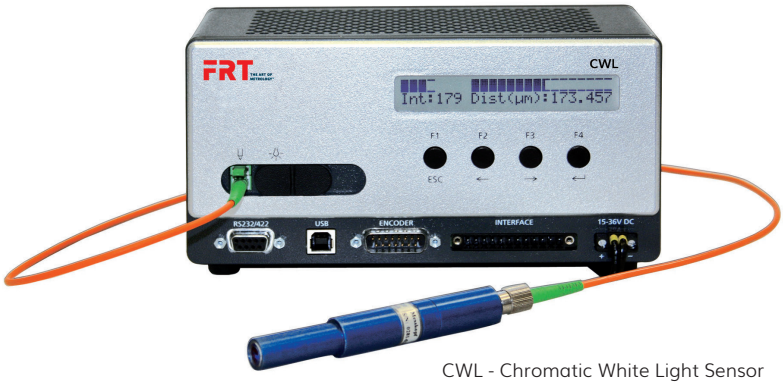
# CWL

## Chromatic White Light Sensor

- Semiconductor
- MST / MEMS / Nano
- Sapphire & LED
- Photovoltaic
- Automotive
- Medical Technology
- Engineering
- Optics
- Packaging Industry




CWL - Chromatic White Light Sensor

The **CWL** is a fast optical distance measurement sensor that can be precisely configured for a given application. For this, there are various standard and special sensor heads with different measuring ranges available. The non-destructive principle of the **CWL** works as well on surfaces with high as with low reflectivity. Due to its bright light source and a measuring rate of up to 4 kHz, the sensor is used for a variety of applications in industrial production control and R&D. Up to 16 different measuring heads can be calibrated on one sensor electronics and can be used according to the requirements.

## Typical Measuring Tasks

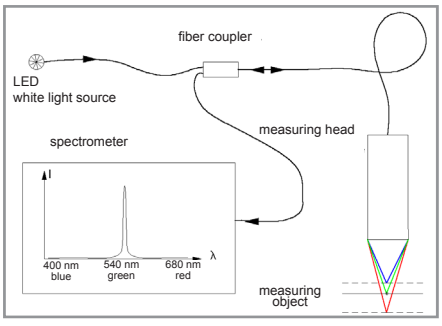
- 2D profile
- 3D topography
- step height
- roughness and planarity
- structure and contour

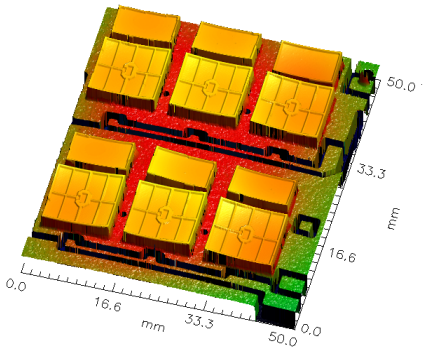
## Features

- optical, non-contact and non-destructive measurement
- high measuring rate up to 4 kHz
- bright and small measuring spot
- high lateral and vertical resolution
- excellent signal/noise ratio
- small, robust and wear-free measuring head

## Measuring Principle

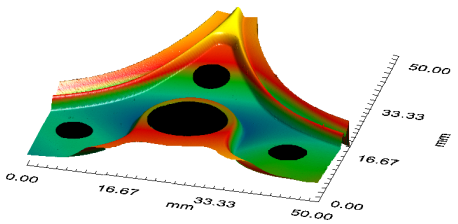
The **CWL** is based on the principle of chromatic distance measurement. White light is focused on the surface by a measuring head with a strongly wavelength-dependent focal length. The spectrum of the light reflected on the surface generates a peak in the spectrometer. The wavelength of this peak is used to determine the distance to the sample surface.




Leadframe module, measured with the CWL 3 mm (Reference: Danfoss Silicon Power GmbH)

Area measurement of the front side of a leadframe module in 3D view. The surface topography can be examined with regard to the warpage of the module, tilting of the diodes and transistors, as well as the thickness of the flash and the roughness.




Cylinder head gasket, measured with CWL 3 mm

Surface measurement of the top of a cylinder head gasket in 3D view. The surface topography can be examined with regard to the flank angle, bead width and height, wave height, shaft misalignment and radii.

| Measuring Range z [1] | 300 µm | 600 µm | 1 mm | 3 mm | 6 mm | 10 mm |
|---|---|---|---|---|---|---|
| working distance | 4.5 mm | 6.5 mm | 19.1 mm | 22.5 mm | 35 mm | 70 mm |
| max. resolution z [2] | 3 nm | 6 nm | 10 nm | 30 nm | 60 nm | 100 nm |
| max. resolution x,y | 2.5 µm | 2 µm | 1.8 µm | 6 µm | 8 µm | 12 µm |
| numerical aperture | 0.5 | 0.5 | 0.7 | 0.5 | 0.43 | 0.33 |
| measuring angle [3] | 90° ± 30° | 90° ± 30° | 90° ± 45° | 90° ± 30° | 90° ± 25° | 90° ± 20° |

[1] further measuring ranges available
[2] maximum resolution based on reduced measuring range
[3] diffusive surfaces allow for wider measuring angles

| Sensor Electronics | CWL | CWL F |
|---|---|---|
| measuring rate | 4,000 measurements / sec. (4 kHz) | 4,000 measurements / sec. (4 kHz) |
| light source | LED | halogen lamp |
| repeatability | < 0.00009 x measuring range | |
| measuring accuracy | < 0.00033 x measuring range + 0.001 x measuring height | |
| calibration tables | 16 | |
| dimensions (W x H x D) | 200 mm x 100 mm x 93 mm | 260 mm x 115 mm x 310 mm |

| Scope of Delivery |
|---|
| measuring head, optical fiber, sensor electronics, operating manual |

Use this sensor in a FRT multi-sensor metrology tool!

**MicroProf® 100**
compact tabletop metrology tool with 100 mm x 150 mm measuring area

**MicroProf® 200/300**
standalone metrology tool with up to 415 mm x 305 mm measuring area

**MicroProf® FE/FS**
fully automated metrology tool with wafer handling for MEMS and semiconductor fabs

## Questions? Talk to an expert!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