

# PRECITEC LR

Optical sensor for ultra-precision surfaces





## PUSHING THE LIMITS WITH OPTICAL MEASUREMENT

The PRECITEC Lateral Resolution (LR) is a highly-accurate optical sensor which uses focused white light to take measurements from even the most challenging surfaces.

When tactile measuring technology reaches its limits, optical sensors can take over. Operating as part of a multisensor setup on the ultra-precision Leitz Infinity, Leitz Ultra or Leitz PMM-C coordinate measuring machines (CMMs), the PRECITEC LR optical sensor enables measurement of all kinds of materials, with particularly high accuracy at the submicron level. A large acceptance angle makes the sensor ideal for heavily inclined surfaces, while the non-contact measurement method is perfect for fragile parts.

With the PRECITEC LR in addition to regular tactile probes, the capability of the CMM is extended for a more complete measurement solution.



The PRECITEC LR is elevating the capabilities of coordinate measuring machines beyond the usual boundaries.

# OPENING UP NEW APPLICATION AREAS

The PRECITEC LR offers excellent measurement quality on the most complex of surfaces, including transparent, reflective, matte or coated materials, making it a versatile solution for a huge range of industrial applications.

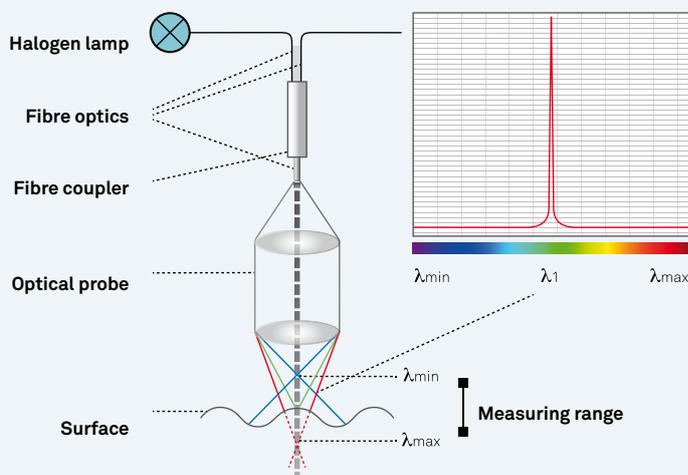
## Simple measuring – without readjustments

- No special requirements for environmental lighting
- Calibration of sensor with a reference sphere
- Offset between tactile probes and optical sensor less than 1  $\mu\text{m}$
- Environmental requirements similar to CMMs
- Suitable for single-point probing and continuous surface scanning



## Suitable for with all kinds of materials and surfaces

- Glass
- Plastic
- Transparent
- Sensitive
- Reflective
- Matte
- Coated



## Measurement principle

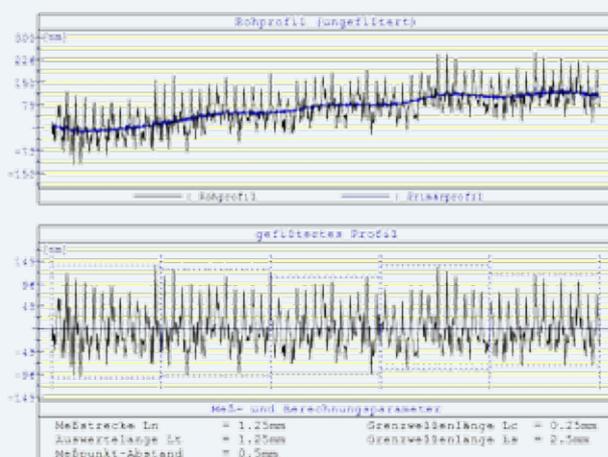
White light is focused on the surface of the measurement object via optics with a pronounced chromatic aberration. The reflected light reaches a maximum for the wavelength, for which the surface is in focus. The spectrum of the reflected light shows a pronounced peak whose spectral position determines the distance to the surface.

# GIVING METROLOGY A DIFFERENT ANGLE

Extending the ability of quality inspection to ensure the best possible quality control for each and every part, the PRECITEC LR offers several additional features to complement tactile probing options.

## Features and benefits

- Ultra-precision non-contact measuring, independent of the type of surface
- High axial resolution for measuring complex structures
- No damage to the workpiece surface (e.g. scratching), therefore suitable for sensitive and soft materials
- Large acceptance angle of  $90^\circ \pm 40^\circ$ , for measuring very oblique surfaces
- Small spot diameter for high lateral resolution and optical roughness measurement
- Ability to measure very large and heavy parts – the sensor measuring range corresponds to the measuring range of the CMM
- Measures on dispersive, reflective, inclined, curved and aspherical surfaces
- Automatic swap between tactile and optical sensors within a measuring process
- No differences in handling compared to tactile sensors



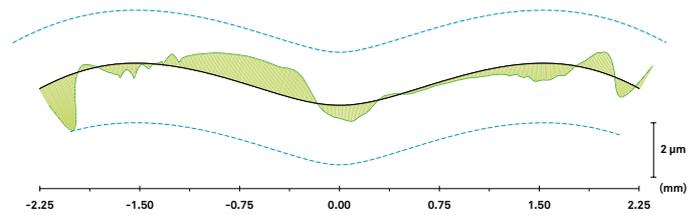
## Additional configuration options

- Optical roughness measurement with amplitudes of up to 80  $\mu\text{m}$  based on ISO 4287, ISO 4288 and ISO 13565 with the QUINDOS roughness module
- Layer-thickness measurement on request

# ACCURACY, FLEXIBILITY AND ACCESSIBILITY

## TECHNICAL DATA

Beam direction	0° and 90°
Measurement range	100 µm
Measuring distance	6.5 mm
Resolution in Z	3 nm
Spot diameter	1.4 µm
Lateral resolution	0.7 µm
Numeric aperture	0.66
Laser class	1
Measuring angle	up to 90° ± 40°
Dimensions	L = 158 mm D = 30 mm
Software	QUINDOS

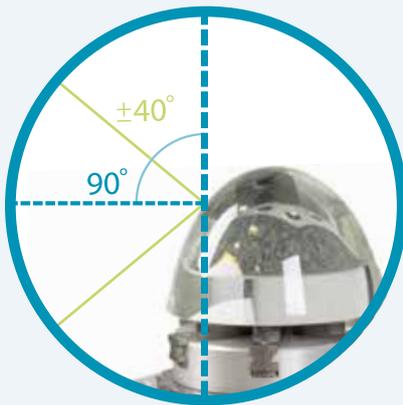


Excellent repeatability:

10 optical measurements using an aspherical lens of <math>< 0.1 \mu\text{m}</math>

Superelevation:

200, form tolerance:  $\pm 2 \mu\text{m}$



The acceptance angle of up to  $90^\circ \pm 40^\circ$  – measuring on inclines and curves over a wide range (depending on the surface properties):

- Glass or plastic lenses within the optics industry
- Prisms, profiles
- Precision tools



# SYSTEM INTEGRATION FOR MAXIMUM COMPATIBILITY

The PRECITEC LR sensor is optimised for use with the ultra-high accuracy Leitz Infinity, Leitz Ultra and Leitz PMM-C coordinate measuring machines and QUINDOS software.



## QUINDOS

QUINDOS evaluation software is the perfect analysis tool for Leitz CMMs with PRECITEC LR. QUINDOS offers tailor-made options for your measurement task.

- Integral CAD core for 3D presentation of all geometries
- Easy CAD-supported programming, e.g. presentation of special target points, probe points, calculated elements.



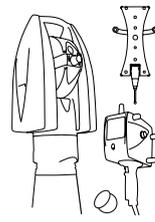
The PRECITEC LR sensor enhances the ultra-precision Leitz Infinity, Leitz Ultra and Leitz PMM-C measuring machines. The controller processes the sensor data and forms the interface with the evaluation software.



PRECISION MEASURING INSTRUMENTS



PORTABLE MEASURING ARMS



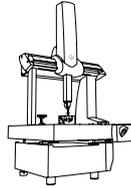
LASER TRACKERS & STATIONS



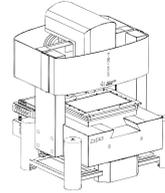
WHITE LIGHT SCANNERS



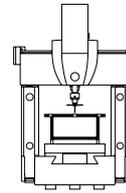
SENSORS



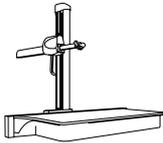
BRIDGE CMMS



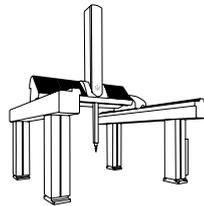
MULTISENSOR & OPTICAL SYSTEMS



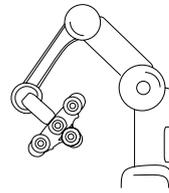
ULTRA HIGH ACCURACY CMMS



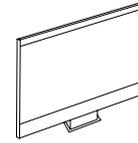
HORIZONTAL ARM CMMS



GANTRY CMMS



AUTOMATED APPLICATIONS



SOFTWARE SOLUTIONS



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