



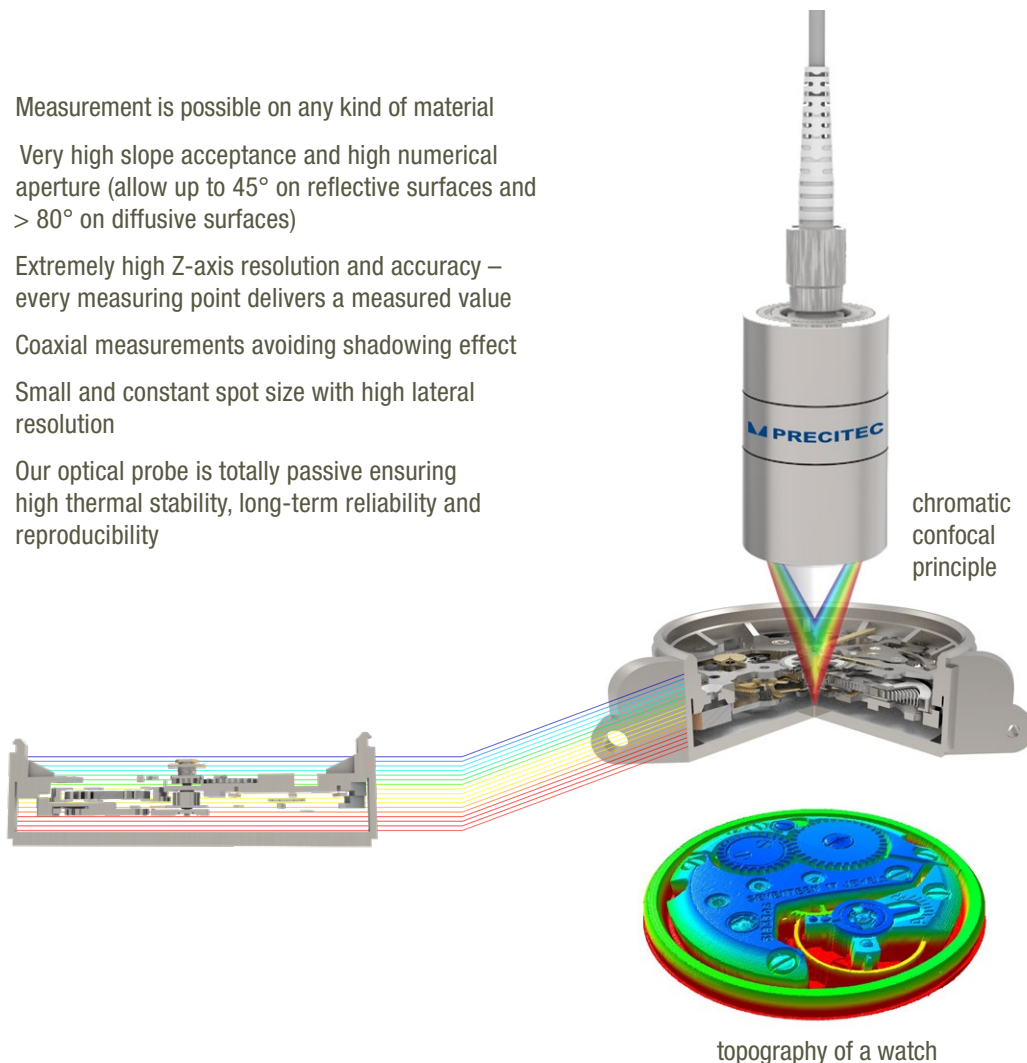
## OVERVIEW CHROMATIC CONFOCAL POINT SENSORS

- ▶ Measurement is possible on any kind of material
- ▶ Very high slope acceptance and high numerical aperture (allow up to 45° on reflective surfaces and > 80° on diffusive surfaces)
- ▶ Extremely high Z-axis resolution and accuracy – every measuring point delivers a measured value
- ▶ Coaxial measurements avoiding shadowing effect
- ▶ Small and constant spot size with high lateral resolution
- ▶ Our optical probe is totally passive ensuring high thermal stability, long-term reliability and reproducibility

DISTANCE

THICKNESS

TOPOGRAPHY



# MULTI-FUNCTIONAL CHROMATIC CONFOCAL SENSORS

Our chromatic confocal sensors use high performance optical lenses to focus white light at different distances along the optical axis, creating microscopic resolution along a large depth of field. Our technology and the huge variety of probes enable distance measurements on almost all materials and thickness measurements on optically transparent samples, almost independent from sample geometry and with highest precision.



Whatever your needs are in high-precision chromatic confocal sensor technology, we can meet them through our broad product portfolio of line and point sensors, multi-point sensors, and as an OEM sensor supplier. If you have any specialized requirements, we will gladly work with you to develop a customized solution.

CONTROLLER	CHRocodile 2 S <sup>1)</sup> CHRocodile 2 SE <sup>1)</sup>
Measured value	distance, thickness
Measuring rate	Up to 70,000 Hz
Number of measuring channels	1
Light source	LED, external light source
Synchronization with external devices	
Interfaces	RS-422 (up to 10 M)
Operating temperature	+5°C up to +50°C
Dimension (width x height x depth)	
Weight	
Supply voltage	
Rated power	20 W
Note	high speed measurements, automatic light control measurements available for interferometric mode; CHRocodile 2 SE: external coupler single shot HDR mode
Item number	5103126 (CHRocodile 2 S) 5103132 (CHRocodile 2 SE)

<sup>1)</sup> Controllers can switch between interferometric and chromatic confocal mode | <sup>2)</sup> Eth

OPTICAL PROBES									
Measuring range LED	100 µm <sup>3)</sup>	100 µm	300 µm	400 µm	600 µm	1 mm	1 mm	1.2 mm	2 mm
Measuring range laser diode (HP) <sup>4)</sup>	70 µm	70 µm	170 µm	240 µm	360 µm	0.57 mm	0.61 mm	0.73 mm	1.3 mm
Working distance <sup>5)</sup>	1.0 mm	1.4 mm	4.5 mm	15 mm	6.5 mm	19 mm	1.5 mm	3 mm	61 mm
Thickness measuring range <sup>6)</sup>	up to 150 µm	up to 150 µm	up to 450 µm	up to 600 µm	up to 900 µm	up to 1.5 mm	up to 1.5 mm	up to 1.8 mm	up to 3 mm
Axial resolution	2 nm	2 nm	3 nm	3 nm	3 nm	4 nm	4 nm	4 nm	6 nm
Linearity	30 nm	30 nm	80 nm	95 nm	100 nm	170 nm	170 nm	200 nm	260 nm
Lateral resolution	1.3 µm	1.8 µm	2.5 µm	2 µm	2 µm	1.8 µm	5 µm	7.5 µm	6 µm
Measurement angle to surface <sup>7)</sup>	± 55 – 85°	± 45 – 85°	± 30 – 85°	± 45 – 85°	± 30 – 85°	± 45 – 85°	± 30 – 85°	± 14 – 85°	± 15 – 85°
Dimension (without fiber connector)	l = 128 mm d = 15 mm	l = 66 mm d = 8 mm	l = 111 mm d = 15 mm	l = 149 mm d = 50 mm	l = 125 mm d = 19 mm	l = 164 mm d = 55 mm	l = 52 mm d = 19 mm	l = 59 mm d = 8 mm	l = 109 mm d = 45 mm
Weight	130 g	36 g	38 g	1250 g	71 g	1118 g	69 g	10 g	315 g
Item number	5100998	5002430	5002227	5002589	5002183	5002130	5101166	5010270	5002399
Note	ultra high numerical aperture	high numerical aperture	angled available (5003578)	high numerical aperture	angled available (5005028)	high numerical aperture, angled available (5008545)	compact version, angled	angled, small diameter	angled available (5005026), large working distance

<sup>3)</sup> Measuring range: 100 µm with LED light source, 70 µm with laser driven light source | <sup>4)</sup> Slightly change in the working distance for HP light source | <sup>5)</sup> Bottom of optical probe to middle of measuring range | <sup>6)</sup> Refractive index n = 1.5 | <sup>7)</sup> Decreasing accuracy for large incident angles. Low (high) number represents maximum slope angle on reflective (diffuse) surfaces.

CHRcodile 2 S HP <sup>1)</sup>	CHRcodile 2 S HS <sup>1)</sup>	CHRcodile 2 DPS	CHRcodile 2 DPS HP
distance, thickness	distance, thickness	distance, thickness, step height, and two sided thickness measurement	
Up to 70,000 Hz	Up to 10,000 Hz	Up to 10,000 Hz	Up to 35,000 Hz
1	1	2	2
Laser diode	LED	LED	Laser diode
trigger input, synchronizing output, 5 encoder inputs			
100 Mbaud, Ethernet (100 Mbit), EtherCAT <sup>®2)</sup> , 2 x analog (-10 V up to +10 V, 16 Bit)			
+5°C up to +45°C	+5°C up to +50°C	+5°C up to +50°C	+5°C up to +45°C
220 mm x 110 mm x 125 mm			
2 kg			
16 - 30 V DC (with separate power supply 90 - 264 V AC)			
30 W	20 W	20 W	30 W
single shot HDR mode	measurements on low reflective surfaces	replaces two individual controllers	
5100447	5100981	5010534	5104948

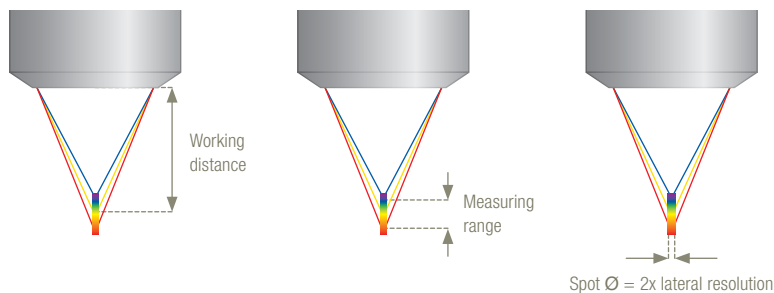
etherCAT<sup>®</sup> is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

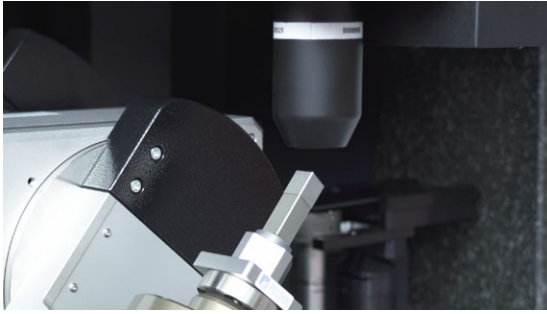


Our chromatic sensor consists of a controller and an optical probe connected via an optical fiber.



									OPTICAL PROBES
2 mm	3 mm	5 mm	6 mm	8 mm	10 mm	12 mm	25 mm	38.5 mm	Measuring range LED
1.1 mm	3.0 mm	3.4 mm	3.7 mm	5.0 mm	5.4 mm	7.5 mm	12.2 mm	19.5 mm	Measuring range laser diode (HP) <sup>4)</sup>
14 mm	18 mm	30 mm	53 mm	36 mm	68 mm	54 mm	77 mm	101 mm	Working distance <sup>5)</sup>
up to 3 mm	up to 4.5 mm	up to 7.5 mm	up to 9 mm	up to 12 mm	up to 15 mm	up to 18 mm	up to 38 mm	up to 58 mm	Thickness measuring range <sup>6)</sup>
6 nm	8 nm	12 nm	14 nm	18 nm	22 nm	26 nm	52 nm	79 nm	Axial resolution
260 nm	400 nm	700 nm	800 nm	850 nm	1.1 μm	1.4 μm	2.8 μm	4.3 μm	Linearity
6 μm	6 μm	12.5 μm	7 μm	15 μm	12 μm	15 μm	12.5 μm	17 μm	Lateral resolution
±30–85°	±30–85°	±15–85°	±30–85°	±15–85°	±20–85°	±15–85°	±15–85°	±12–85°	Measurement angle to surface <sup>7)</sup>
l = 70 mm d = 33 mm	l = 123 mm d = 49 mm	l = 46 mm d = 24 mm	l = 190 mm d = 40/79 mm	l = 45 mm d = 25 mm	l = 146 mm d = 65 mm	l = 61 mm d = 36 mm	l = 243 mm d = 76 mm	l = 242 mm d = 76 mm	Dimension (without fiber connector)
220 g	417 g	96 g	1110 g	97 g	721 g	281 g	1637 g	1737 g	Weight
5005126	5104462	5009198	5009001	5002327	5001688	5002508	5002206	5009498	Item number
angled available (5007184), extra bright	high accuracy range, extended range 5 mm for LED sensors	extra compact, large working distance	large working distance	extra compact	extra bright	extra compact	extra bright	wide thickness measuring range	Note



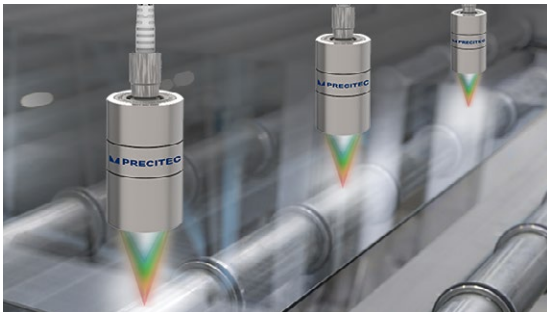


## CMM Machines

Optical sensors are key in enhancing CMM accuracy. With a wide range and uniform material detection, they boost efficiency in measuring complex geometries. This technology reduces inspection time, cuts manufacturing costs, and allows swift, detailed data capture for complex objects, marking a notable advancement in CMM development.

## Roughness

Revolutionizing precision: Optical sensors redefine roughness measurement and offer non-intrusive (oder non-contact), high-resolution analysis. Manufacturers benefit from accurate assessments without direct contact, reducing the risk of material changes. With faster measurement speeds, these sensors increase efficiency and contribute to improved quality control and manufacturing processes.



## Harsh environment

In glass production, non-contact sensors are the secret heroes. No more battling with dust and extreme heat – these high-tech sensors and probes measure thickness, and shape without touching the sensitive glass surface. Robust, durable and unaffected by heat, they are the secret weapon for efficient and perfect production.

## Gear Inspection

The inspection of gears is crucial to avoid runout, noise and stress in mating gears. A hybrid mix of tactile and optical technology reduces measurement time by 40% and ensures accuracy, quality and cost efficiency. Chromatic confocal sensors from Precitec 3D Metrology offer unparalleled speed and accuracy, optimizing gear production in today's competitive landscape.



The given data was generated for a typical application and may be different given other circumstances. Furthermore, misprints, changes and/or innovations may lead to differences in the listed measurements, technical data and features. All information is therefore non-binding and technical data, measurements and features are not guaranteed.

**Precitec 3D Metrology** - measure more precisely with light.