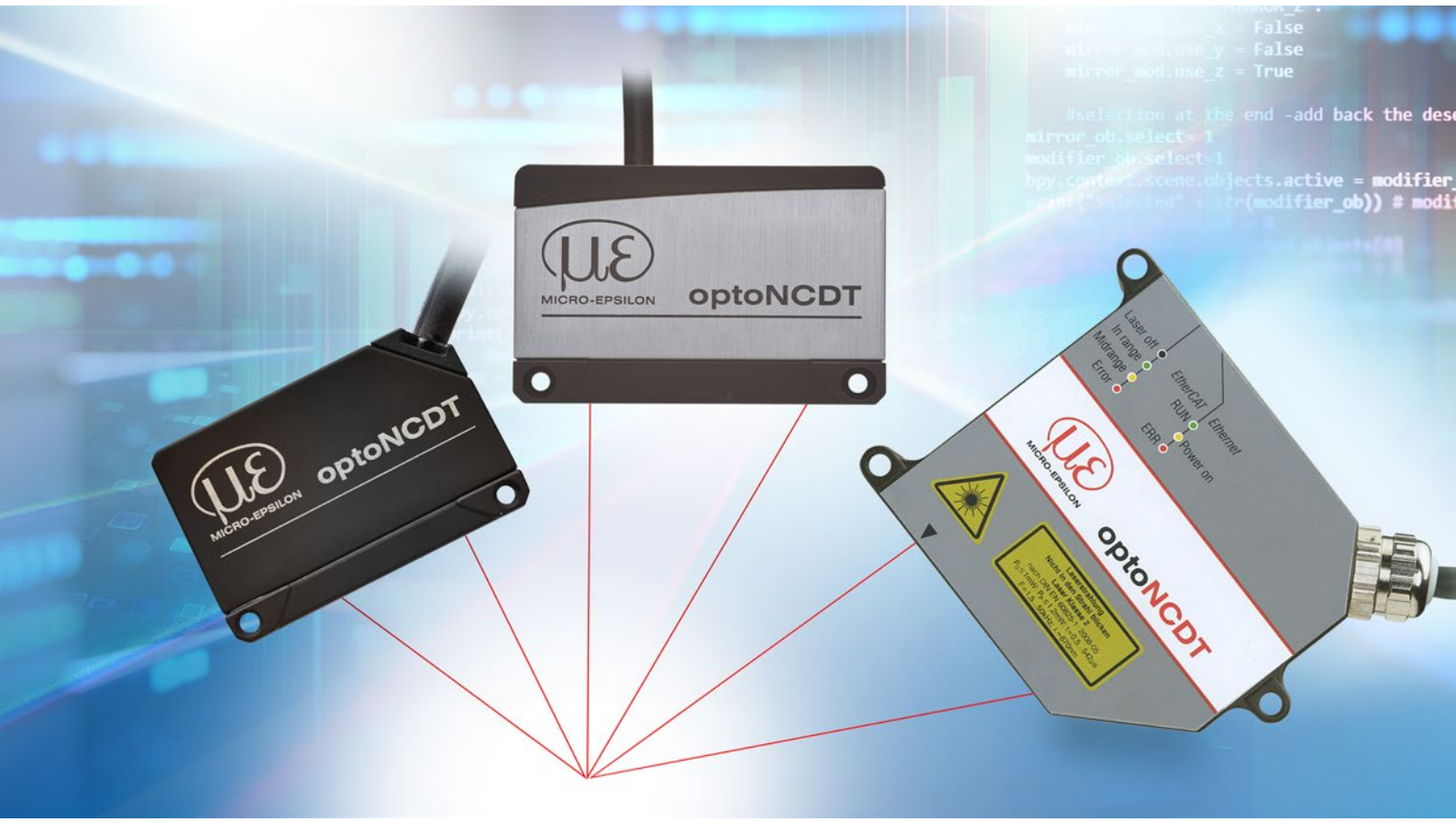
MICRO-EPSILON

More Precision

optoNCDT // Laser displacement sensors (triangulation)



High precision laser sensors in miniature design
optoNCDT 1220 / 1320 / 1420

designed for advanced
AUTOMATION

- Measuring rate up to 8 kHz
- Analog (U/I) / RS422 / PROFINET / EtherNet/IP / EtherCAT
- Active Surface Compensation
- Repeatability 0.5 µm
- Ideal for series and OEM applications
- Low weight, ideal for high accelerations

Best in Class:
Compact, precise and faster

The optoNCDT 1x20 laser sensors are among the best in their class. The sensors offer a unique combination of speed, size and performance. The laser sensors are used for the precise measurement of displacement, distance and position in all fields of automation technology, such as machine building, 3D printers and robotics.

The optoNCDT 1x20 sensors use an intelligent surface control feature. The Active Surface Compensation (ASC) ensures stable measurement results regardless of changing colors or brightness of the target surface.

Ideal for industrial series applications

Different output signals enable the sensor to be integrated into plant and machine control systems. As well as analog voltage and current outputs, a digital RS422 interface provides distance information from the sensor.

Due to the universal setting and evaluation possibilities, the optoNCDT 1x20 sensors meet all the requirements for use in industrial series and OEM applications.

Model	Technology	Measuring range	Repeatability	Linearity
optoNCDT 1220		10 - 500 mm	1 µm	0.10 %
optoNCDT 1320		10 - 500 mm	1 µm	0.10 %
optoNCDT 1420		10 - 500 mm	0.5 µm	from 0.08 %
optoNCDT 1420LL		10 - 50 mm	0.5 µm	from 0.08 %
optoNCDT 1420CL1		10 - 50 mm	0.5 µm	from 0.08 %

Highest precision in a minimum of space

Compact size combined with low weight opens up new fields of application. The selectable connector type, i.e. cable or pigtail, together with compact size reduce the sensor installation effort to a minimum.

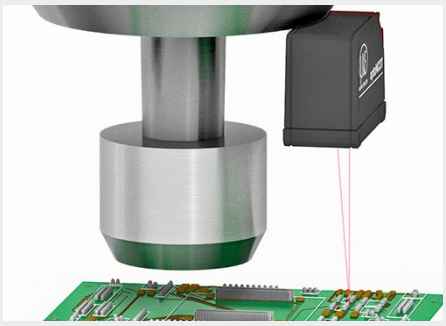
Now even more powerful!

The optoNCDT 1x20 sensors have been optimized for industrial series use. Furthermore, the robust IP67 sensor housing allows use in industrial environments, even with high accelerations. A high-performance D/A converter enables 16 bit resolution at the analog output. Therefore, the sensor achieves even more precise measurement results. With the doubled measuring rate, even faster measurements can now be performed.

Application examples

Dimension control of turned parts

Monitoring the expansion of battery cells



Distance control of print heads

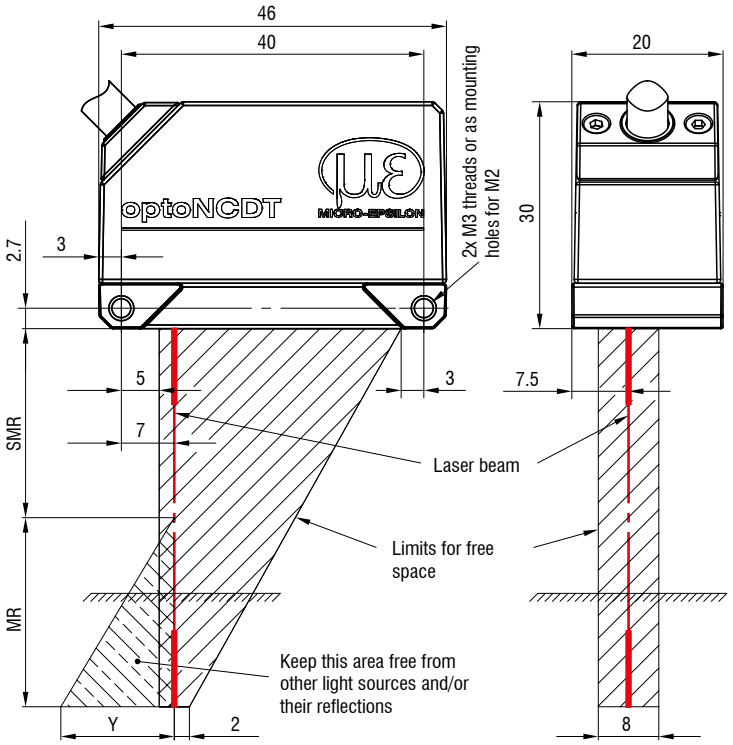
Technical data
optoNCDT 1220 / 1320

Laser point - optoNCDT 1220

Model		ILD1220-10	ILD1220-25	ILD1220-50	ILD1220-100	ILD1220-200	ILD1220-500
Measuring range		10 mm	25 mm	50 mm	100 mm	200 mm	500 mm
Start of measuring range		20 mm	25 mm	35 mm	50 mm	60 mm	100 mm
Mid of measuring range		25 mm	37.5 mm	60 mm	100 mm	160 mm	350 mm
End of measuring range		30 mm	50 mm	85 mm	150 mm	260 mm	600 mm
Measuring rate [1]		4 adjustable stages: 2 kHz / 1 kHz / 0.5 kHz / 0.25 kHz					
Linearity [2]		< ±10 µm	< ±25 µm	< ±50 µm	< ±100 µm	< ±200 µm	< ±750 µm … 1500 µm
		< ±0.10 % FSO					< ±0.15 % … 0.30 % FSO
Repeatability [3]		1 µm	2.5 µm	5 µm	10 µm	20 µm	50 µm
Temperature stability [4]		±0.015 % FSO / K			±0.02 % FSO / K		
Light spot diameter [5]	SMR	100 x 130 µm	200 x 260 µm	250 x 340 µm	710 x 910 µm	710 x 910 µm	710 x 910 µm
	MMR	45 x 50 µm	55 x 60 µm	80 x 95 µm			
	EMR	158 x 200 µm	255 x 330 µm	300 x 380 µm			
	smallest Ø	45 x 40 µm with 24 mm	53 x 60 µm with 31 mm	70 x 85 µm with 42 mm	710 x 910 µm	710 x 910 µm	710 x 910 µm
Light source		Semiconductor laser < 1 mW, 670 nm (red)					
Laser class		Class 2 in accordance with IEC 60825-1: 2014					
Permissible extraneous light [6]		20,000 lx				7,500 lx	
Supply voltage		24V (11,2 … 30V) DC, P < 2W					
Power consumption		< 2 W (24 V)					
Signal input		1 x HTL laser on/off; 1 x HTL multifunction input: trigger in, zero setting, teach					
Digital interface		RS422 (16 bit)					
Analog output		4 ... 20 mA (16 bit, freely scalable within the measuring range)					
Digital output		1 x error output: npn, pnp, push pull, push-pull negative					
Connection		integrated cable 2 m, open ends, minimum bending radius 30 mm (fixed installation)					
Mounting		Screw connection via two mounting holes					
Temperature stability	Storage	-20 … +70 °C (non-condensing)					
	Operation	0 … +50 °C (non-condensing)					
Shock (DIN EN 60068-2-27)		15 g / 6 ms in 3 axes, 1000 shocks each					
Vibration (DIN EN 60068-2-6)		20 g / 20 … 500 Hz in 3 axes, 2 directions and 10 cycles each					
Protection class (DIN EN 60529)		IP67					
Material		Aluminum housing					
Weight		approx. 40 g (without cable), approx. 120 g (incl. cable)					
Control and indicator elements [7]		Select button: zero, teach, factory settings; web interface for setup; 2 x color LEDs for power / status					

[1] Factory setting 1 kHz, modifying the factory setting requires the IF2001/USB converter (see accessories)
[2] FSO = Full Scale Output; the specified data apply to white, diffuse reflecting surfaces (Micro-Epsilon reference ceramic for ILD sensors)
[3] Measuring rate 1 kHz, median 9
[4] Related to digital output in the mid of the measuring range; the specified value is only achieved by mounting on a metallic sensor holder. Good heat dissipation from the sensor to the holder must be ensured; this value is valid in the range from 20 to 50 °C
[5] ±20 %; SMR = Start of measuring range; MMR = Mid of measuring range; EMR = End of measuring range
[6] Illuminant: light bulb
[7] Access to web interface requires connection to PC via IF2001/USB (see accessories)

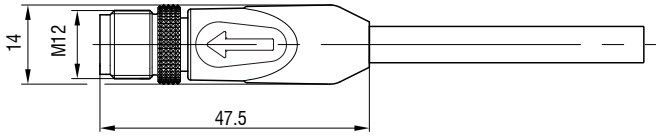
Dimensions
optoNCDT 1220 / 1320 / 1420



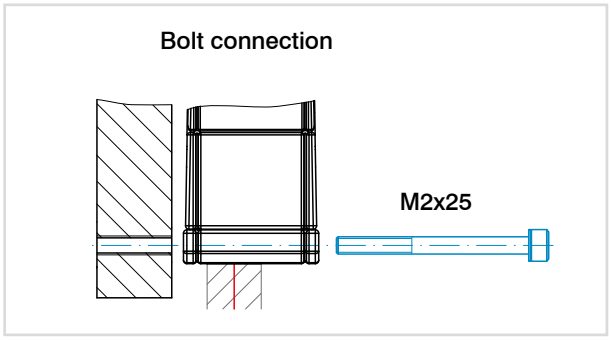
MR	SMR	Y
10	20	10
25	25	21
50	35	28
100	50	46
200	60	70
500	100	190

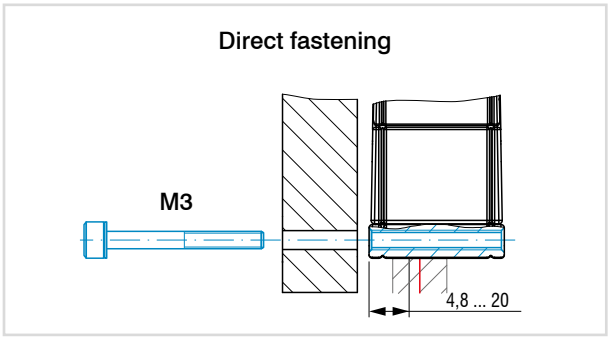
(Dimensions in mm, not to scale)
MR = measuring range; SMR = start of measuring range;
MMR = mid of measuring range; EMR = end of measuring range

Connector (sensor side)



Installation options





Accessories for optoNCDT 1220/1320/1420

Power supply unit
PS2020 (power supply 24 V / 2.5 A, input 100 - 240 VAC, output 24 VDC / 2.5 A, mounting onto symmetrical standard rail 35 mm x 7.5 mm, DIN 50022)

Protective film
Transparent protective film 32 x 11 mm for ILD1x20

Scope of supply

- 1 ILD1x20 sensor
- 1 Assembly instructions
- 1 digital calibration protocol accessible via web interface
- Accessories (2x M2 screws and 2 washers)

Article designation

ILD1420-	10	LL	CL1
			Laser class No indication: class 2 (standard) CL1: Class 1 (only with ILD1420)
		Laser type No indication: Red laser point (standard) LL: Laser Line (only with ILD1420)	
	Measuring range in mm		

Series
ILD1220: Compact laser displacement sensor for OEM and serial applications
ILD1320: Compact laser triangulation displacement sensor
ILD1420: Smart laser triangulation displacement sensor

Connection possibilities
optoNCDT 1220 / 1320 / 1420

Sensors with integrated cable

Cable diameter: 5.40 ±0.2 mm
Drag chain: no
Robot: no
Temperature range: -25 … 105 °C (moving)
-40 … 105 °C (not moving)
Bending radius: > 27 mm (fixed installation)
> 54 mm (dynamic)

Sensor	Cables	Type	Connection possibilities and accessories	
ILD1220-xx	**Integrated cable** Length 2 m	Open ends	**Supply voltage connection** Power supply unit PS2020	
ILD1320-xx ILD1420-xx ILD1420-xxLL	**Integrated cable** Length 3 m		**Interface module of RS422 to USB** IF2001/USB IC2001/USB	
			Interface module for Industrial Ethernet connection IF2035-PROFINET IF2035-EIP IF2035-EtherCAT	

Drag-chain suitable extension and adapter cables

Cable diameter: 6.0 ±0.2 mm
Drag chain: yes
Robot: no (optional on request)
Temperature range: -40 … 90 °C
Bending radius: > 30 mm (fixed installation)
> 60 mm (dynamic)

Sensor	Cables	Type	Connection possibilities and accessories	
ILD1420-xx ILD1420-xxLL	**Extension cable pigtail** Length 3 m / 6 m / 10 m / 15 m *Art. no.* *Designation* 29011067 PCF1420-3/I 29011068 PCF1420-6/I 29011069 PCF1420-10/I 29011070 PCF1420-15/I 29011071 PCF1420-3/U 29011072 PCF1420-6/U 29011073 PCF1420-10/U 29011074 PCF1420-15/U	Open ends	**Supply voltage connection** Power supply unit PS2020	
			Interface module of RS422 to USB IF2001/USB IC2001/USB	
			Interface module for Industrial Ethernet connection IF2035-PROFINET IF2035-EIP IF2035-EtherCAT	
	Adapter cable for PC interface card Length 3 m / 6 m / 10 m *Art. no.* *Designation* 29011079 PCF1420-3/IF2008 29011088 PCF1420-6/IF2008 29011089 PCF1420-10/IF2008	Sub-D	**Interface card for synchronous data acquisition** IF2008PCIe / IF2008E	
			4-fold interface module from RS422 to USB IF2004/USB	
	Adapter cable for sensor calculation Length 3 m / 6 m / 9 m *Art. no.* *Designation* 29011171 PCF1420-3/C-Box 29011172 PCF1420-6/C-Box 29011170 PCF1420-9/C-Box	Sub-D	**Controller for D/A conversion and evaluation of up to 2 sensor signals** Dual Processing Unit	
	Adapter cable for sensor calculation Length 2 m *Art. no.* *Designation* 29011149 PCE1420-2/M12	M12	**Interface module for Ethernet connection of up to 8 sensors** IF2008/ETH	

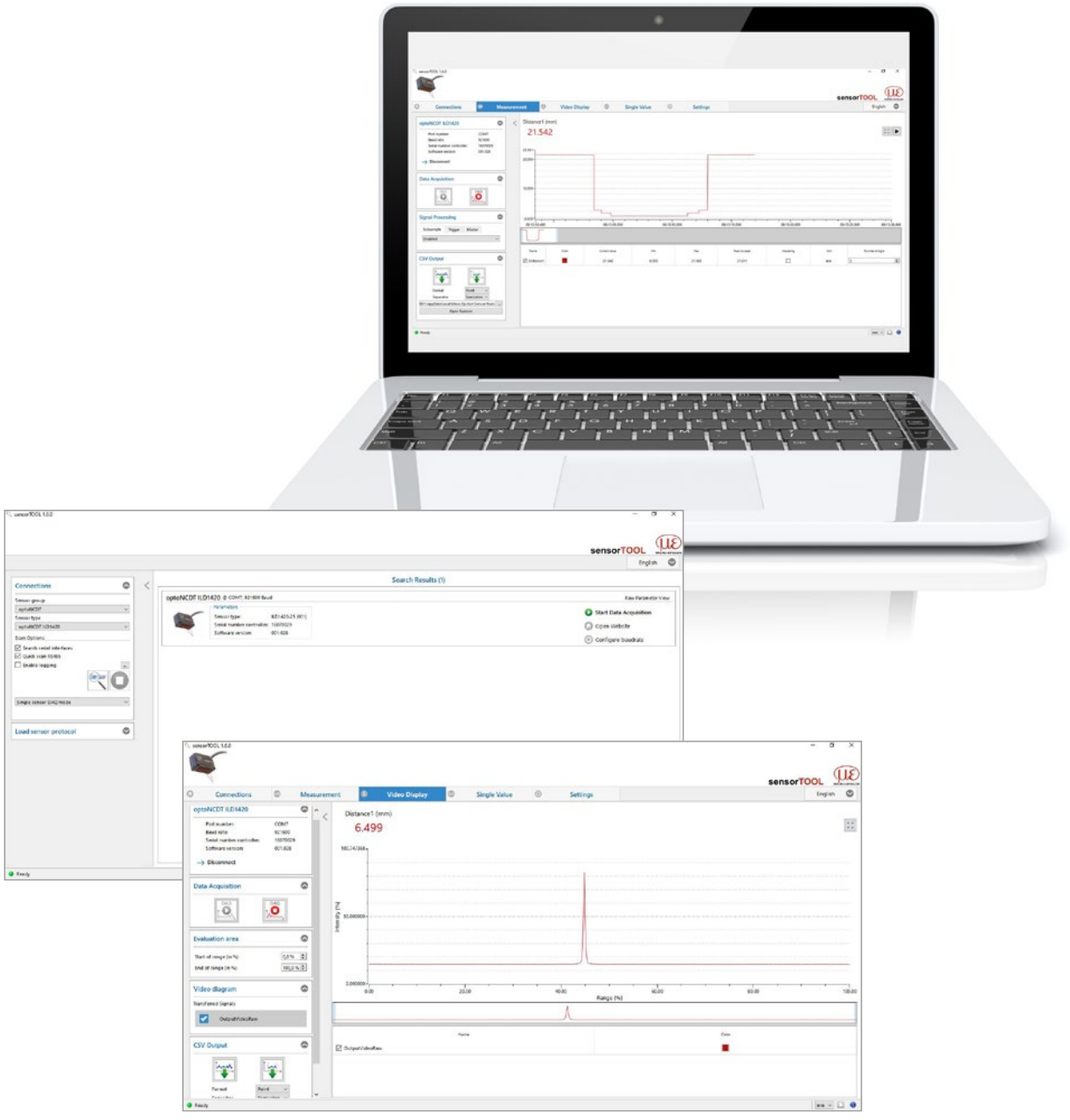
Other cables

Cable diameter: 6.7 mm
Drag chain: yes
Robot: no
Temperature range: -40 … 80 °C
Bending radius: > 27 mm (fixed installation)
> 51 mm (dynamic)

Input	Cables	Type	Connection possibilities and accessories	
2 x Sub-D (PCF1420-x/ IF2008)	**Adapter cable for the connection of two sensors per Sub-D connector** Length 0.1 m *Art. no.* 2901528 *Designation* IF2008-Y-adapter cable 	Sub-D	**Interface card for synchronous data acquisition** IF2008PCIe / IF2008E	
			4-fold interface module from RS422 to USB IF2004/USB	

sensorTOOL

The Micro-Epsilon sensorTOOL is a powerful software that is used to operate one or more optoNCDT sensors. The sensorTOOL can be used to access the sensor connected to the PC, display its complete data stream and save it in a file (in Excel-compatible CSV format). The sensor is configured via its web interface.



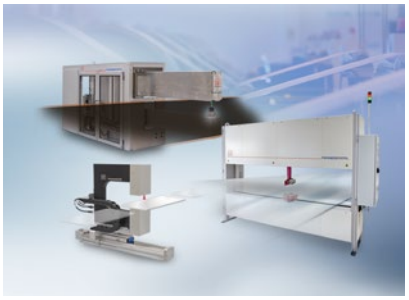
Free download

All software tools, drivers and documented driver DLL for easy integration of the sensors into existing or internally-generated software are available free of charge under www.micro-epsilon.de/download

Sensors and Systems from Micro-Epsilon

Sensors and systems for displacement, distance and position

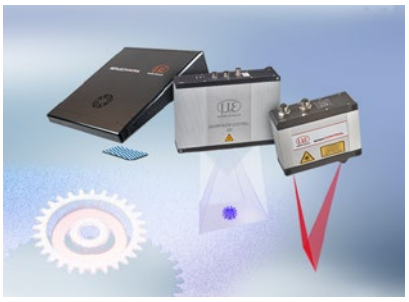
Sensors and measurement devices for non-contact temperature measurement



Measuring and inspection systems for metal strips, plastics and rubber

Optical micrometers and fiber optics, measuring and test amplifiers

Color recognition sensors, LED analyzers and inline color spectrometers



3D measurement technology for dimensional testing and surface inspection

Modifications reserved / Y9761188-N092066GKE

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