

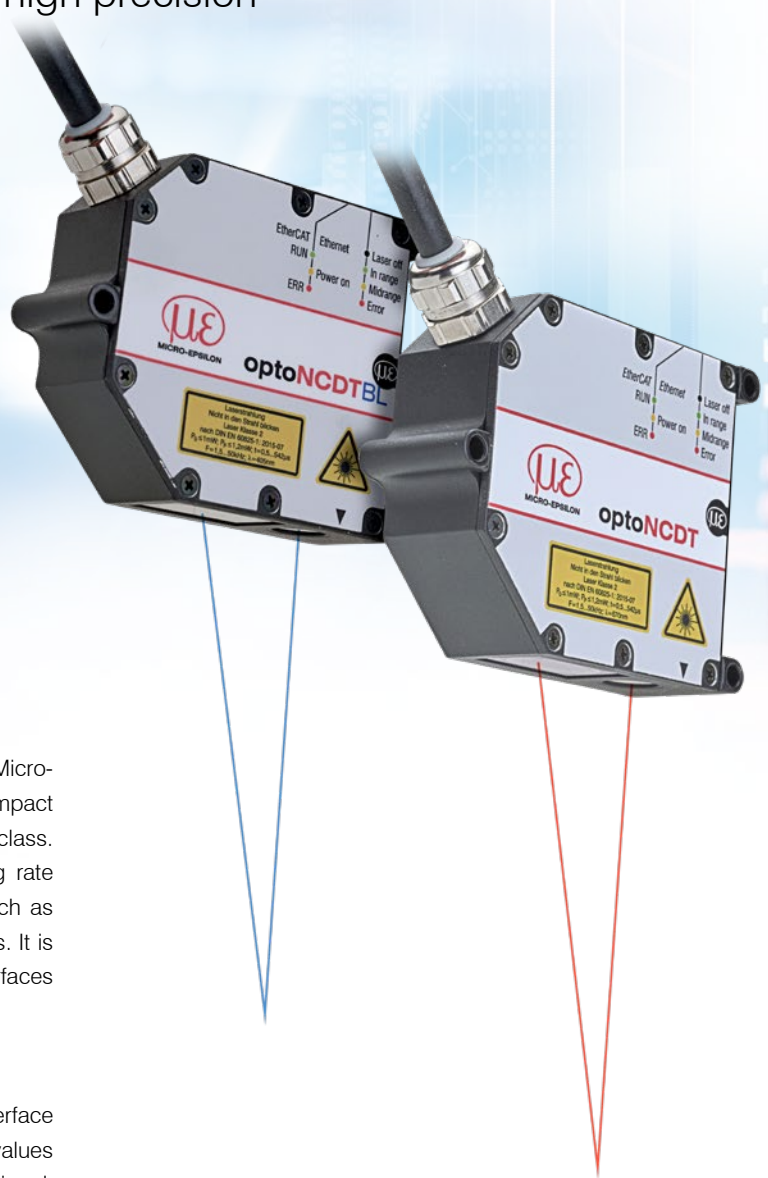
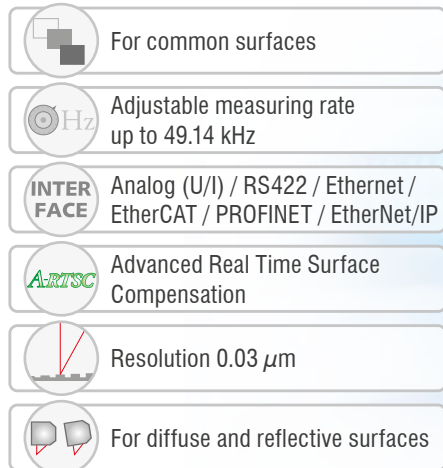


More Precision

optoNCDT // Laser displacement sensors (triangulation)



Highly dynamic laser sensors with high precision **optoNCDT 2300**



The optoNCDT 2300 sensors form the high-end segment of Micro-Epsilon laser sensors. The entire electronics is integrated in a compact sensor housing which is a worldwide unique feature of this sensor class. The high-precision laser sensor has an adjustable measuring rate of 49.14 kHz and is used for particularly fast applications, such as monitoring vibrations or measurements on challenging surfaces. It is used on diffuse reflective surfaces and for directly reflecting surfaces when equipped with the special alignment feature.

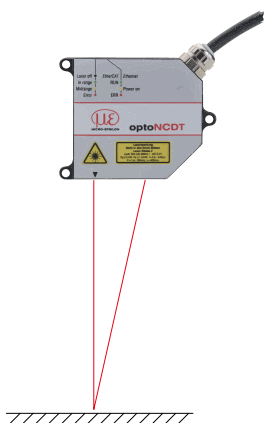
User-friendly web interface for easy operation

The optoNCDT 2300 laser sensors can be operated via a web interface which offers multiple possibilities in order to process measured values and signals, e.g., peak selection, filter and masking of the video signal.

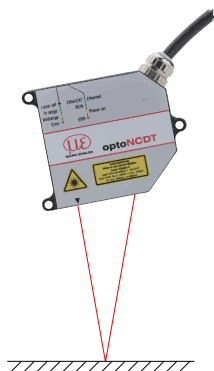
Fast exposure control for demanding surfaces

The new A-RTSC (Advanced Real Time Surface Compensation) feature is a development based on the proven RTSC technology and, with its improved dynamic range, enables more precise real time surface compensation during the measurement process. This means the sensor is not influenced by rapidly changing surface reflections and provides stable measurement results.

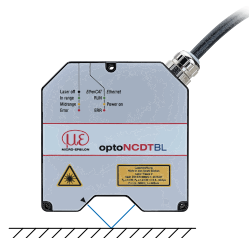
Model	Technology	Measuring range	Repeatability	Linearity
optoNCDT 2300		2 - 300 mm	0.03 μm	from 0.02 %
optoNCDT 2300BL		2 - 50 mm	0.03 μm	from 0.02 %
optoNCDT 2300LL		2 - 50 mm	0.1 μm	from 0.02 %
optoNCDT 2300-2DR		2 mm	0.03 μm	from 0.03 %
optoNCDT 2310		10 - 50 mm	0.5 μm	from 0.03 %



Distance measurement on diffuse reflecting surfaces



Distance measurement on directly reflecting surfaces

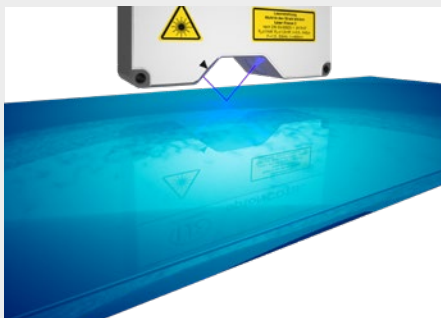


High precision distance measurement on directly reflecting surfaces

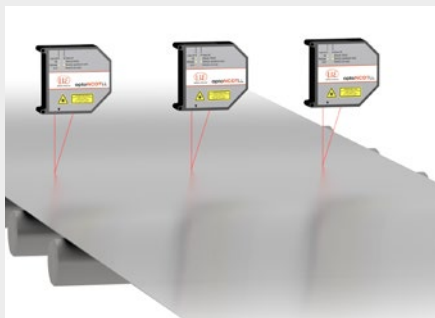
Versatile use

The optoNCDT 2300 sensors can be operated in several measurement modes: in standard mode for distance measurement on diffusely reflecting materials. In addition, the sensors can be used for distance measurement on reflective and shiny surfaces (direct reflection).

Application examples



Distance measurement of coated glass



Planarity testing of metal strips



Testing the radial run out of rollers

Technical data

optoNCDT 2300



Laser-Line - optoNCDT 2300LL

Model		ILD2300-2LL	ILD2300-10LL	ILD2300-20LL	ILD2300-50LL
Measuring range ^[1]		2 (2) mm	10 (5) mm	20 (10) mm	50 (25) mm
Start of measuring range ^[1]		24 (24) mm	30 (35) mm	40 (50) mm	45 (70) mm
Mid of measuring range ^[1]		25 (25) mm	35 (37.5) mm	50 (55) mm	70 (82.5) mm
End of measuring range ^[1]		26 (26) mm	40 (40) mm	60 (60) mm	95 (95) mm
Linearity ^[2]		< ±0.6 μm	< ±2 μm	< ±4 μm	< ±10 μm
		< ±0.03 % FSO	< ±0.02 % FSO	< ±0.02 % FSO	< ±0.02 % FSO
Resolution ^[3]		0.03 μm	0.15 μm	0.3 μm	0.8 μm
Light spot diameter ^[4]	SMR	85 x 240 μm	120 x 405 μm	185 x 485 μm	350 x 320 μm
	MMR	24 x 280 μm	35 x 585 μm	55 x 700 μm	70 x 960 μm
	EMR	64 x 400 μm	125 x 835 μm	195 x 1200 μm	300 x 1940 μm
Material		Die-cast zinc housing			

^[1] Value in brackets applies for a measuring rate of 49.14 kHz

^[2] FSO = Full Scale Output

The specified data apply to white, diffuse reflecting surfaces (Micro-Epsilon reference ceramic for ILD sensors)

^[3] Measuring rate 20 kHz

^[4] ±10 %; SMR = Start of measuring range; MMR = Mid of measuring range; EMR = End of measuring range



Direct reflection - optoNCDT 2300-2DR

Model		ILD2300-2DR/BL
Measuring range ^[1]		2 (1) mm
Start of measuring range ^[1]		9 (9) mm
Mid of measuring range ^[1]		10 (9.5) mm
End of measuring range ^[1]		11 (10) mm
Linearity ^[2]		< ±0.6 μm
		< ±0.03 % FSO
Resolution ^[3]		0.03 μm
Temperature stability ^[4]		±0.01 % FSO / K
Light spot diameter ^[5]	SMR	21.6 x 25 μm
	MMR	8.5 x 11 μm
	EMR	22.4 x 23.7 μm
Light source		Semiconductor laser <1 mW, 405 nm (blue violet)
Power consumption		< 2 W (24 V)
Connection		integrated pigtail 0.25 m with 14-pin cable connector, min. bending radius 30 mm when firmly installed; optional extension to 3 m / 10 m possible (see accessories for suitable connection cables)
Material		Aluminum housing
Weight		approx. 400 g (incl. pigtail)

^[1] Value in brackets applies for a measuring rate of 49.14 kHz

^[2] The specified data apply to directly reflecting surfaces; FSO = Full Scale Output

^[3] Measuring rate 20 kHz

^[4] Relates to digital output in mid of measuring range

^[5] ±10 %; SMR = Start of measuring range; MMR = Mid of measuring range; EMR = End of measuring range

Light spot diameter determined with point-shaped laser with Gaussian fit (full 1/e² width)

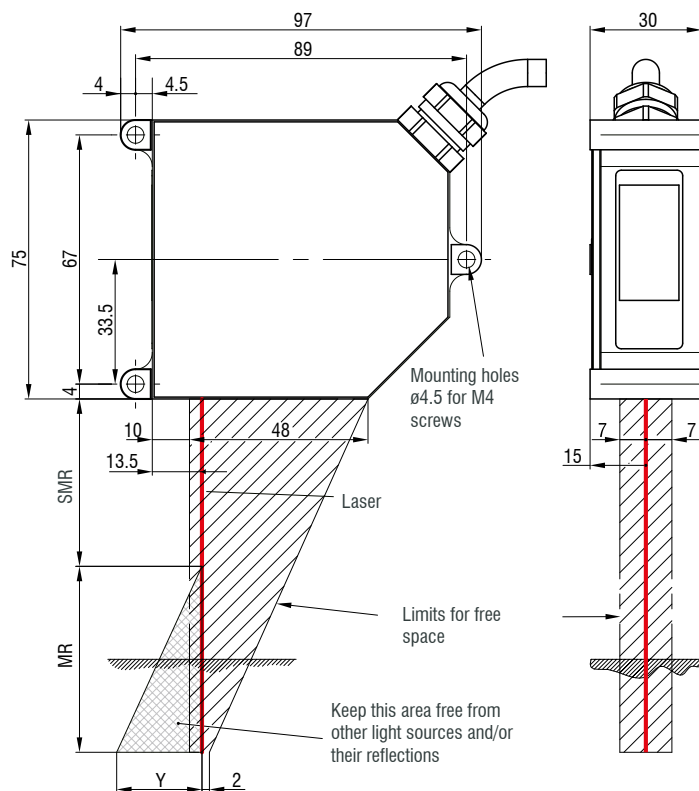
Dimensions

optoNCDT 2300

optoNCDT 2300 / Measuring range 2 - 100

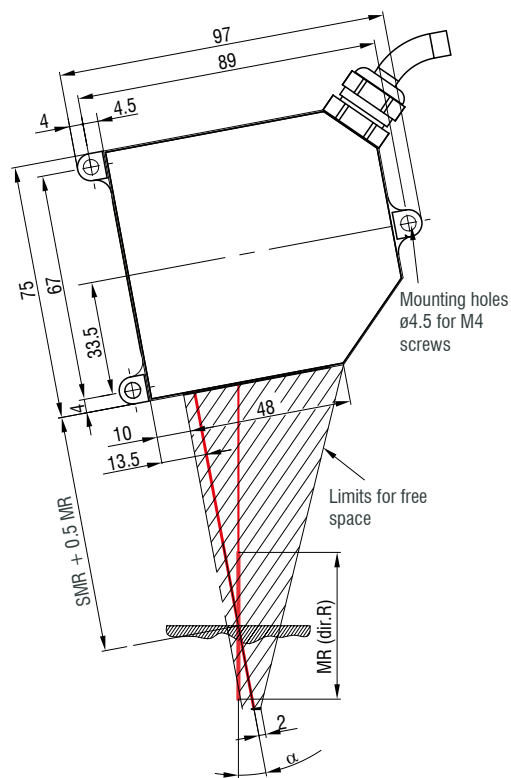
optoNCDT 2300-2 ... 2300-100

Diffuse reflection



optoNCDT 2300-2 ... 2300-20

Direct reflection



optoNCDT 2300 (Diffuse reflection)
optoNCDT 2300LL
optoNCDT 2300BL (Diffuse reflection)

MR	SMR	Y
2	24	1.5
5	24	3.5
10	30	6.5
20	40	10.0
50	45	23.0
100	70	33.5

optoNCDT 2300 (Direct reflection)
optoNCDT 2300BL (Direct reflection)

MR	SMR + 0.5 MR	α
2	25	20.5 °
5	26.5	20 °
10	35	17.5 °
20	50	13.8 °

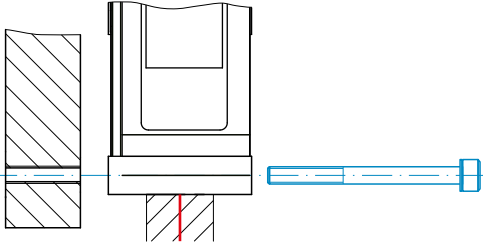
Connector (sensor side)



Installation options

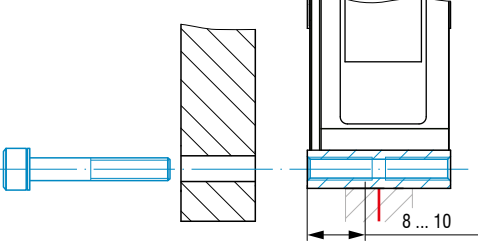
Housings M and L

Bolt connection



ILD2300-2 ... ILD2300-100 ILD2300BL / ILD2300LL	M4
ILD2300-200 / -300 ILD2310-10 / -20 / -40	M4
ILD2310-50 ILD2310-50BL	M5
ILD2300-2DR	M3

Direct fastening



ILD2300-2 ... ILD2300-100 ILD2300BL / ILD2300LL	-
ILD2300-200 / -300 ILD2310-10 / -20 / -40	M5
ILD2310-50 ILD2310-50BL	M6
ILD2300-2DR	M4

Accessories for optoNCDT 2300/2310

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)

Mounting plate

for easy alignment of the DR models

Protective housings

see page 60

Scope of supply

- 1 sensor ILD23x0 with 0.25 m connection cable and cable socket
- 2 laser warning signs according to IEC standard
- RJ45 short-circuit plug

Article designation

ILD2300-	6	LL	3R
Laser class No indication: class 2 (standard) 3R: class 3R (on request)			
Laser type No indication: Red laser point (standard) LL: Laser Line BL: Blue Laser DR: Direct Reflection			
Measuring range in mm			
Series ILD2300: Highly dynamic laser sensor in the 50 kHz class ILD2310: Laser sensors with small measuring range and large offset distance			

Connection possibilities

optoNCDT 2300

Drag-chain suitable extension and adapter cables

Cable diameter:	max. 7.5 mm
Drag chain:	ja
Robot:	no
Temperature range:	-40 ... 70 °C (moving / not moving)
Bending radius:	> 90 mm (fixed installation / dynamic / drag chain)

Sensor	Cables	Type	Connection possibilities and accessories											
ILD2300-xx ILD2300-xxLL ILD2300-xxBL ILD2300-2DR	Extension cable pigtail Length 3 m / 6 m / 9 m / 15 m <table><tr><td>Art. no.</td><td>Designation</td></tr><tr><td>2901717</td><td>PC2300-3/OE</td></tr><tr><td>2901760</td><td>PC2300-6/OE</td></tr><tr><td>2901761</td><td>PC2300-9/OE</td></tr><tr><td>2901762</td><td>PC2300-15/OE</td></tr></table>	Art. no.	Designation	2901717	PC2300-3/OE	2901760	PC2300-6/OE	2901761	PC2300-9/OE	2901762	PC2300-15/OE	Open ends	Supply voltage connection Power supply unit PS2020	
	Art. no.	Designation												
	2901717	PC2300-3/OE												
	2901760	PC2300-6/OE												
2901761	PC2300-9/OE													
2901762	PC2300-15/OE													
	Interface module of RS422 to USB IF2001/USB													
	Interface module for Industrial Ethernet connection IF2035-PROFINET IF2035-EIP IF2035-EtherCAT													
	Interface card for synchronous data acquisition IF2008PCle / IF2008E													
ILD2310-xx	Adapter cable for PC interface card Length 3 m / 6 m <table><tr><td>Art. no.</td><td>Designation</td></tr><tr><td>2901728</td><td>PC2300-3/IF2008</td></tr><tr><td>2901729</td><td>PC2300-6/IF2008</td></tr></table>	Art. no.	Designation	2901728	PC2300-3/IF2008	2901729	PC2300-6/IF2008	Sub-D	4-fold interface module from RS422 to USB IF2004/USB					
Art. no.	Designation													
2901728	PC2300-3/IF2008													
2901729	PC2300-6/IF2008													
	Adapter cable for sensor calculation Length 3 m / 6 m / 9 m <table><tr><td>Art. no.</td><td>Designation</td></tr><tr><td>29011031</td><td>PC2300-3/C-Box/RJ45</td></tr><tr><td>29011044</td><td>PC2300-6/C-Box/RJ45</td></tr><tr><td>29011045</td><td>PC2300-9/C-Box/RJ45</td></tr></table>	Art. no.	Designation	29011031	PC2300-3/C-Box/RJ45	29011044	PC2300-6/C-Box/RJ45	29011045	PC2300-9/C-Box/RJ45	Sub-D	Controller for D/A conversion and evaluation of up to 2 sensor signals Dual Processing Unit			
Art. no.	Designation													
29011031	PC2300-3/C-Box/RJ45													
29011044	PC2300-6/C-Box/RJ45													
29011045	PC2300-9/C-Box/RJ45													
	Adapter cable for sensor calculation Length 2 m <table><tr><td>Art. no.</td><td>Designation</td></tr><tr><td>29011279</td><td>PCE2300-3/M12</td></tr></table>	Art. no.	Designation	29011279	PCE2300-3/M12	M12	Interface module for Ethernet connection of up to 8 sensors IF2008/ETH							
Art. no.	Designation													
29011279	PCE2300-3/M12													
	Adapter cable Sub-D for EtherCAT Length 3 m / 6 m <table><tr><td>Art. no.</td><td>Designation</td></tr><tr><td>2901661</td><td>PC2300-3/SUB-D</td></tr><tr><td>2901976</td><td>PC2300-6/SUB-D</td></tr></table>	Art. no.	Designation	2901661	PC2300-3/SUB-D	2901976	PC2300-6/SUB-D	Sub-D	Signal output Ethernet, EtherCAT, RS422 to PC or PLC PC2300-0,5Y Connection cable ILD2300					
Art. no.	Designation													
2901661	PC2300-3/SUB-D													
2901976	PC2300-6/SUB-D													

Connection cable for high temperature

Cable diameter:	max. 7.5 mm
Drag chain:	no
Robot:	no
Temperature range:	-55 ... 250 °C (moving) -90 ... 250 °C (not moving)
Bending radius:	> 40 mm (fixed installation) > 75 mm (dynamic)

Sensor	Cables	Type	Connection possibilities and accessories	
ILD2300-xx ILD2300-xxLL ILD2300-xxBL ILD2300-2DR ILD2310-xx	Connection cable high temperatures Length 3 m / 6 m / 9 m / 15 m	Open ends	Connection supply voltage PS2020	
	<i>Art. no.</i> <i>Designation</i>		Interface module of RS422 to USB IF2001/USB	
	29011118 PC2300-3/OE/HT			
	29011119 PC2300-6/OE/HT			
	29011095 PC2300-9/OE/HT			
29011120 PC2300-15/OE/HT				
			Interface module for Industrial Ethernet connection IF2035-PROFINET IF2035-EIP IF2035-EtherCAT	

Connection cable for EtherCAT operation

Cable diameter:	max. 7.5 mm
Drag chain:	yes
Robot:	no
Temperature range:	-40 ... 70 °C (moving / not moving)
Bending radius:	> 90 mm (fixed installation / dynamic / drag chain)

Input	Cables	Type	Connection possibilities and accessories	
Sub-D (PC2300-x/ Sub-D)	Adapter cable for EtherCAT Length 0.5 m Art. no. 2901693 Designation PC2300-0,5Y Connection cable ILD2300 	Open ends & RJ45	Signal output EtherCAT & Ethernet	EtherCAT 
	Supply voltage connection Power supply unit PS2020			
	Interface module of RS422 to USB IF2001/USB			

Protective housings for demanding environments

optoNCDT

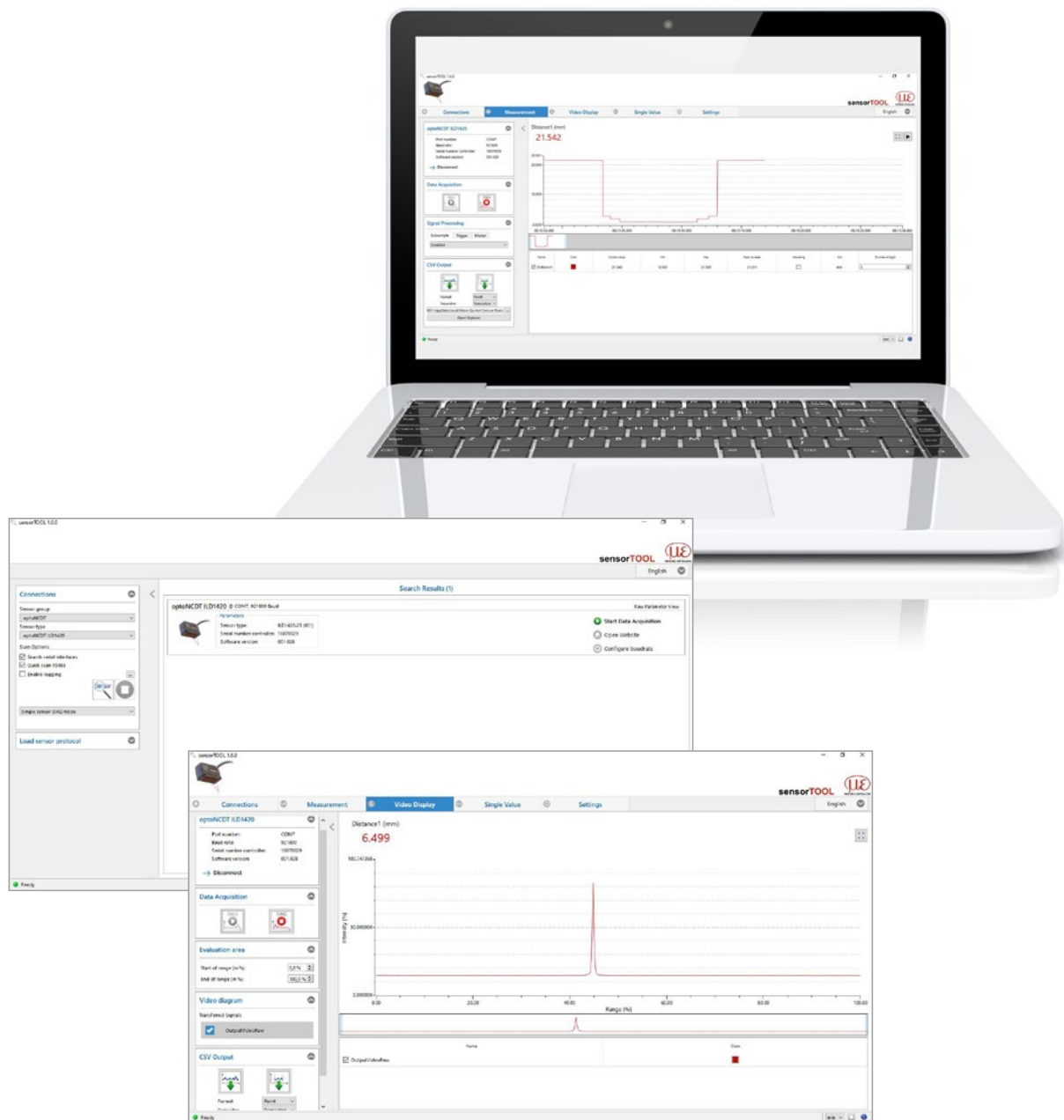
SGH & SGHF models				SGHF-HT model
Protective housing Size S		Protective housing Size M		
SGH	SGHF	SGH	SGHF	
				
(140 x 140 x 71 mm)		(180 x 140 x 71 mm)		(260 x 180 x 154 mm)
Water-resistant housing protects the sensor from solvents and detergents.	Ideal with high ambient temperatures. The integrated air cooling of the housing offers optimum protection for the sensor.	Water-resistant housing protects the sensor from solvents and detergents.	Ideal with high ambient temperatures. The integrated air cooling of the housing offers optimum protection for the sensor.	Water-cooled protective housing with window and compressed-air connection for measurement tasks in ambient temperatures up to 200 °C. Maximum temperature of cooling water T(max) = 10 °C Minimum water flow rate Q(min) = 3 liters/min
Size S suitable for ILD1750-20BL ILD1750-200BL ILD2300-2 / -2LL / -2BL ILD2300-5 / -5BL ILD2300-10 / -10LL / -10BL ILD2300-20 / -20LL ILD2300-50 / -50LL ILD2300-100		Size M suitable for ILD1750-500BL ILD1750-750BL ILD2300-200 ILD2300-300 ILD2310-10 ILD2310-20 ILD2310-40		Suitable for ILD1750-500BL ILD1750-750BL ILD2300-200 ILD2300-300 ILD2310-10 ILD2310-20 ILD2310-40 ILD2310-50BL

Protective housing SGHF ILD1900

Compact protective housing which is simply attached to the sensor. The protective housing has an air purge for cleaning the protective windows. It also cools the sensor.
Suitable for ILD1900-6 / -6LL ILD1900-10 / -10LL ILD1900-25 / -25LL ILD1900-50 / -50LL ILD1900-100 ILD1900-200 ILD1900-500

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

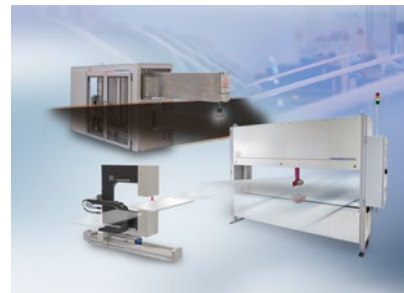
Sensors and Systems from Micro-Epsilon



Sensors and systems for displacement, distance and position



Sensors and measurement devices for non-contact temperature measurement



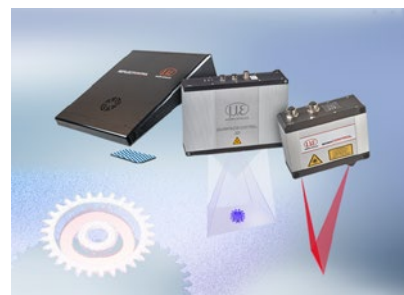
Measuring and inspection systems for metal strips, plastics and rubber



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