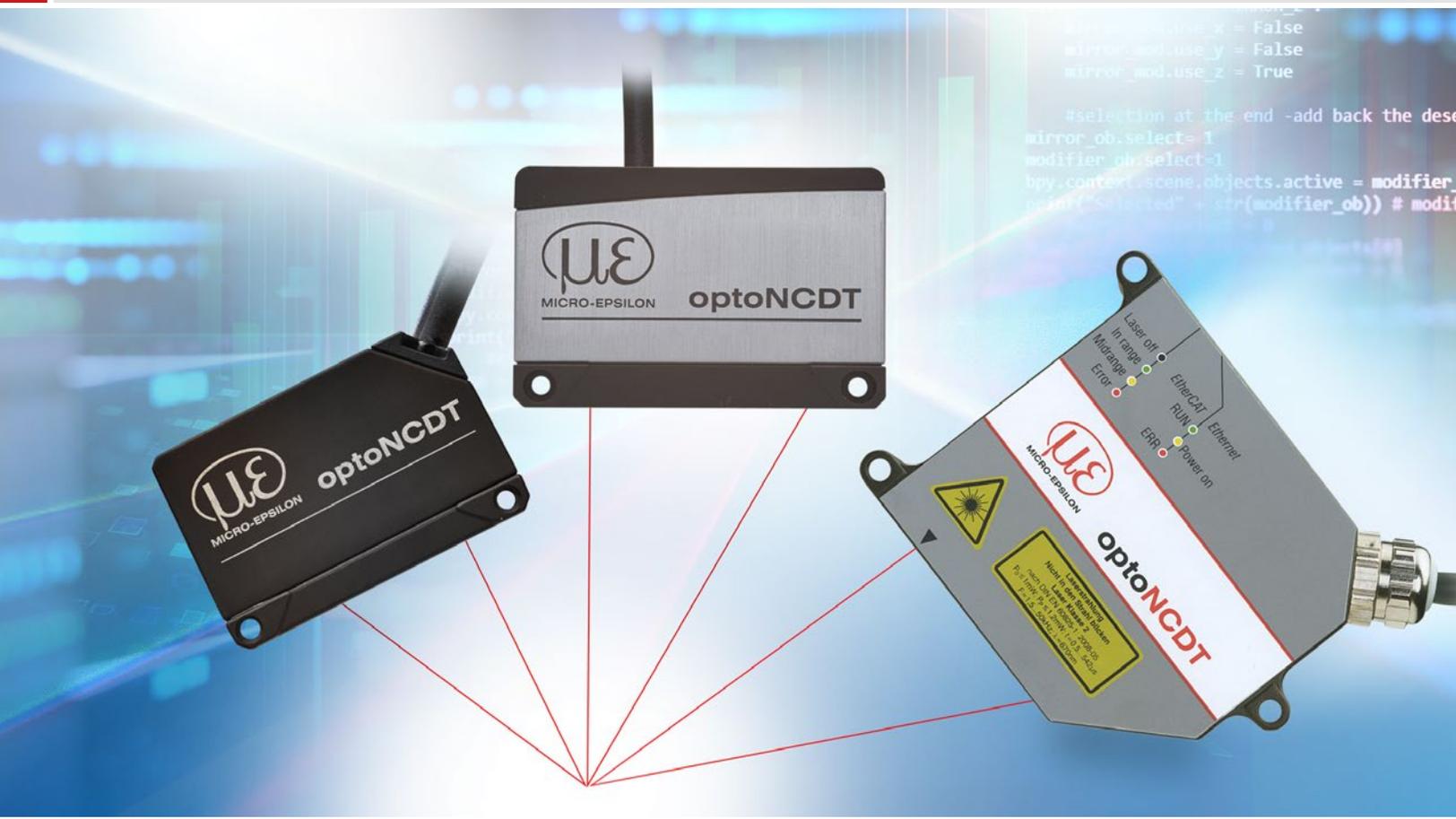




# More Precision

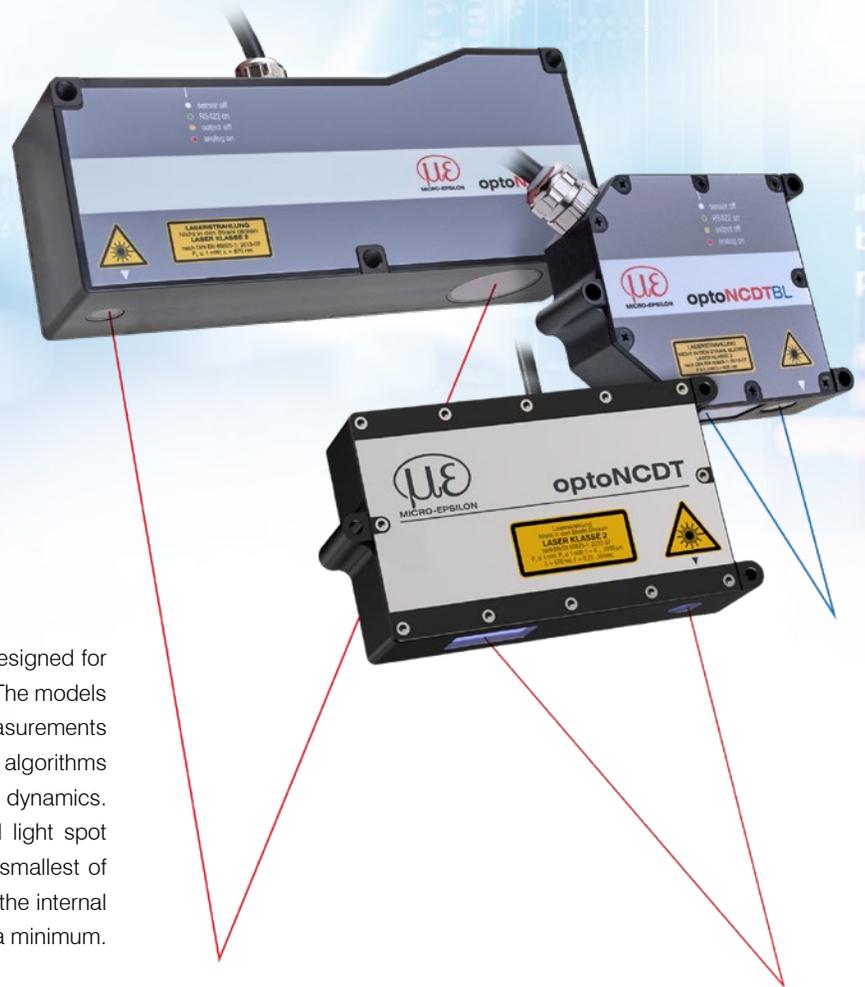
**optoNCDT** // Laser displacement sensors (triangulation)



# Powerful laser sensors for special applications

## optoNCDT 17x0 / optoNCDT 1910

-  Adjustable measuring rate up to 10 kHz
-  **INTER FACE** Analog (U/I) / RS422 / PROFINET / EtherNet/IP
-  **RTSC** Fast surface compensation
-  High repeatability
-  Ideal for large measurement distances



The optoNCDT 1910 and 1750 series laser sensors are designed for fast and precise measurements in industrial applications. The models are used for demanding surfaces and impress in measurements where large distances are required. Innovative evaluation algorithms and improved components enable high accuracy and dynamics. The high-performance optical system generates a small light spot onto the target which enables the detection of even the smallest of components reliably. The pigtail cable in conjunction with the internal controller reduces the installation effort for the sensors to a minimum.

### The intelligent exposure control for demanding surfaces

The optoNCDT 1750 sensors feature real-time surface compensation. The real-time surface compensation feature (RTSC) determines the amount of reflection from the target surface during continuous exposure and in real-time. The exposure time or the amount of light produced by the laser is optimally matched to the reflection characteristics of the target surface. This enables extremely reliable measurements even on reflecting surfaces. The optoNCDT 1910 sensors use Advanced Surface Compensation and are also highly resistant to ambient light.

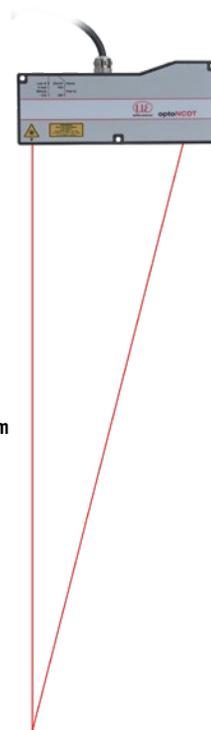
### Ideal for industrial applications

Different output signals enable the integration of the sensor into plant and machine control systems. As well as analog voltage and current outputs, a digital interface provides distance information from the sensor. Due to the universal setting and evaluation possibilities, the sensors meet all the requirements for use in industrial applications.

Model	Technology	Measuring range	Repeatability	Linearity
optoNCDT 1750BL		2 - 750 mm	0.8 $\mu\text{m}$	from 0.06 %
optoNCDT 1750-DR		2 - 20 mm	0.1 $\mu\text{m}$	0.08 %
optoNCDT 1760		1000 mm	from 7.5 $\mu\text{m}$	0.10 %
optoNCDT 1910		500 / 750 mm	from 20 $\mu\text{m}$	0.07 %

### Large distance and large measuring range

The optoNCDT long-range models are used to cover a large measuring range or to measure from a large distance to the target. The long-range laser sensors combine high accuracy and large measuring distances.

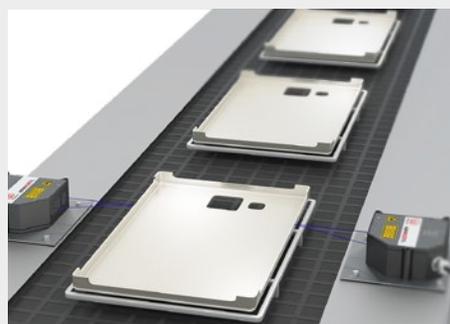


Measurement distances up to 2 m

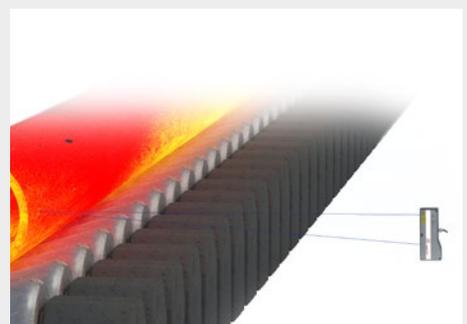
### Application examples



Geometry testing of reflective glass parts



Position check of plastic components



Position measurement of red-hot glowing pipes

# Technical data

## optoNCDT 17x0 Laser sensors for large measuring ranges



### Long-Range - optoNCDT 1760

Model	ILD1760-1000	
Measuring range	1 000 mm	
Start of measuring range	1 000 mm	
Mid of measuring range	1 500 mm	
End of measuring range	2 000 mm	
Measuring rate <sup>[1]</sup>	6 adjustable stages: 7.5 kHz / 5 kHz / 2.5 kHz / 1.25 kHz / 625 Hz / 300 Hz	
Linearity <sup>[2]</sup>	< ±1000 μm	
	< ±0.1 % FSO	
Repeatability <sup>[3]</sup>	100 μm	
Light spot diameter <sup>[4]</sup>	SMR	2500 ... 5000 μm
	MMR	
	EMR	
Light source	Semiconductor laser < 1 mW, 670 nm (red)	
Laser class	Class 2 in accordance with DIN EN 60825-1: 2022-07	
Permissible ambient light	10,000 lx	
Supply voltage	11 ... 30 VDC	
Max. current consumption	150 mA (24 V)	
Signal input	1 x HTL/TTL laser on/off; 1 x HTL/TTL multi-function input: trigger in, slave in, zero setting, mastering, teach-in; 1 x RS422 synchronization input: trigger in, sync in, master/slave, master/slave alternating	
Digital interface <sup>[5]</sup>	RS422 (16 bit) / EtherCAT / PROFINET / EtherNet/IP	
Analog output	4 ... 20 mA / 0 ... 5 V / 0 ... 10 V (16 bit, freely scalable within the measuring range)	
Switching output	2x switching outputs (error & limit value): npn, pnp, push pull	
Connection	integrated pigtail 0.25 m with 14-pin ODU connector, min. bending radius 30 mm when firmly installed; optional extension to 3 m / 10 m possible (see accessories for suitable connection cables)	
Installation	Screw connection via three mounting holes	
Temperature range	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	
Vibration (DIN EN 60068-2-6)	2 g / 20 ... 500 Hz	
Protection class (DIN EN 60529)	IP65	
Material	Aluminum housing	
Weight	approx. 800 g (incl. pigtail)	
Control and indicator elements <sup>[6]</sup>	Select & function keys: interface selections, mastering (zero), teach, presets, quality slider, frequency selection, factory settings; web interface for setup: application-specific presets, peak selection, video signal, freely selectable averaging possibilities, data reduction, setup management 2 x color LEDs for power / status	

<sup>[1]</sup> Factory setting 5 kHz, modifying the factory setting requires the IF2001/USB converter (see accessories)

<sup>[2]</sup> FSO = Full Scale Output; the specified data apply to white, diffuse reflecting surfaces (Micro-Epsilon reference ceramic for ILD sensors)

<sup>[3]</sup> Measuring rate 5 kHz, median 9

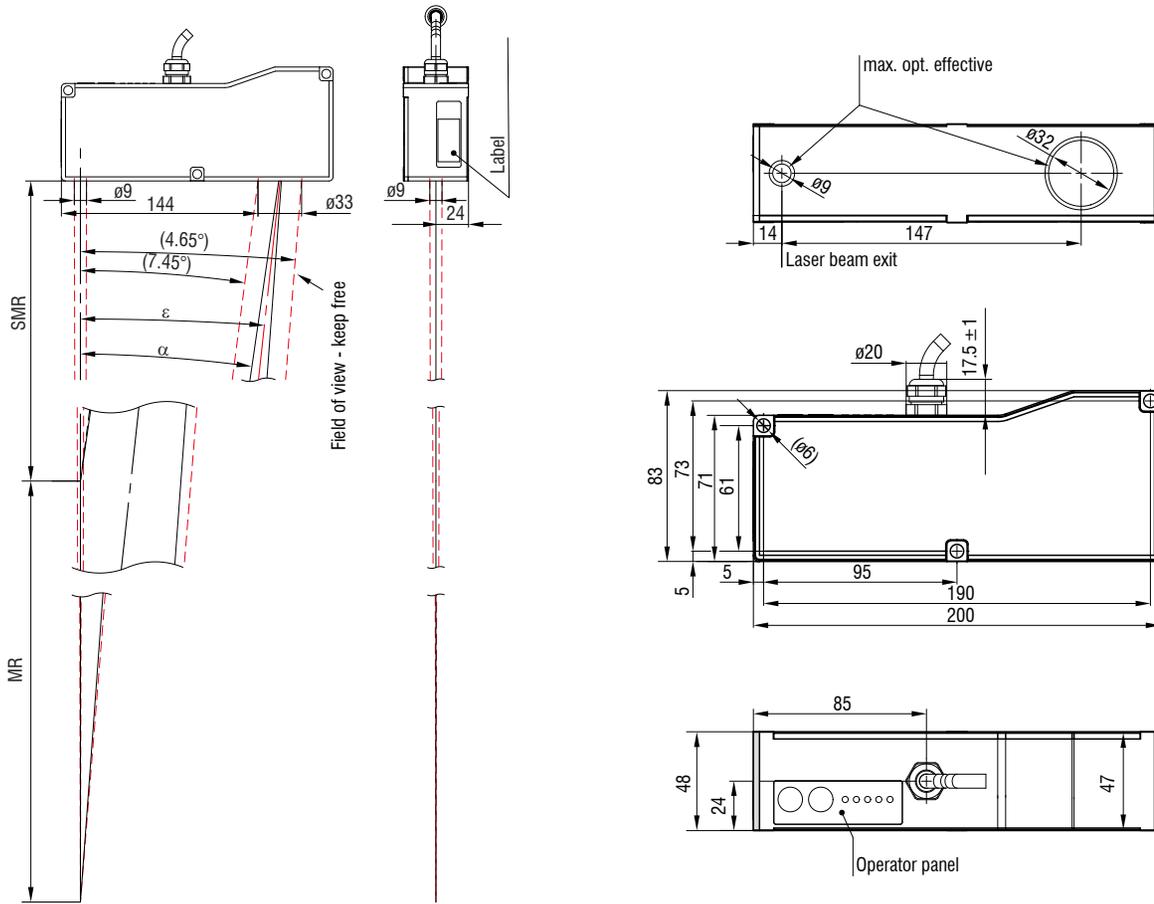
<sup>[4]</sup> ±10 %; SMR = Start of measuring range; MMR = Mid of measuring range; EMR = End of measuring range

<sup>[5]</sup> EtherCAT, PROFINET and EtherNet/IP require connection via interface module (see accessories)

<sup>[6]</sup> Access to web interface requires connection to PC via IF2001/USB (see accessories)

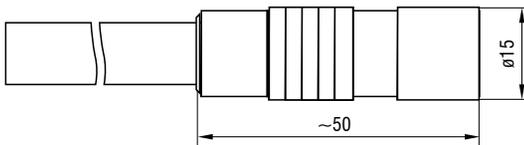
# Dimensions optoNCDT 17x0

optoNCDT 1760-1000



MR	SMR	$\alpha$	$\epsilon$
1000	1000	7.45 °	4.65 °

## Connector (sensor side)



(Dimensions in mm, not to scale)

MR = measuring range; SMR = start of measuring range,

MMR = Mid of measuring range, EMR = end of measuring range

# Connection possibilities

## optoNCDT 17x0 / 1910

### optoNCDT 1750 / 1760

#### Drag-chain suitable extension and adapter cables

Cable diameter: 6.8 ±0.2 mm  
 Drag chain: yes  
 Robot: no  
 Temperature range: -40 ... 90 °C (moving /not moving)  
 Bending radius: > 55 mm (fixed installation / dynamic / drag chain)

Sensor	Cables	Type	Connection possibilities and accessories											
ILD1750-xxBL ILD1750-xxDR ILD1760-1000	<b>Extension cable pigtail</b> Length 3 m / 6 m / 9 m / 15 m <table border="1"> <tr> <th>Art. no.</th> <th>Designation</th> </tr> <tr> <td>2901189</td> <td>PC1700-3</td> </tr> <tr> <td>2901357</td> <td>PC1700-6</td> </tr> <tr> <td>2901191</td> <td>PC1700-10</td> </tr> <tr> <td>2901266</td> <td>PC1700-15</td> </tr> </table>	Art. no.	Designation	2901189	PC1700-3	2901357	PC1700-6	2901191	PC1700-10	2901266	PC1700-15	Open ends	<b>Supply voltage connection</b> Power supply unit PS2020 	
	Art. no.	Designation												
	2901189	PC1700-3												
2901357	PC1700-6													
2901191	PC1700-10													
2901266	PC1700-15													
			<b>Interface module of RS422 to USB</b> IF2001/USB IC2001/USB 											
			<b>Interface module for Industrial Ethernet connection</b> IF2035-PROFINET IF2035-EIP IF2035-EtherCAT 											
	<b>Adapter cable for PC interface card</b> Length 3 m / 6 m <table border="1"> <tr> <th>Art. no.</th> <th>Designation</th> </tr> <tr> <td>2901555</td> <td>PC1700-3/IF2008</td> </tr> <tr> <td>2901556</td> <td>PC1700-6/IF2008</td> </tr> <tr> <td>2901557</td> <td>PC1700-8/IF2008</td> </tr> </table>	Art. no.	Designation	2901555	PC1700-3/IF2008	2901556	PC1700-6/IF2008	2901557	PC1700-8/IF2008	Sub-D	<b>Interface card for synchronous data acquisition</b> IF2008PCIe / IF2008E 			
Art. no.	Designation													
2901555	PC1700-3/IF2008													
2901556	PC1700-6/IF2008													
2901557	PC1700-8/IF2008													
			<b>4-fold USB converter</b> IF2004/USB 											
	<b>Adapter cable for sensor calculation</b> Length 3 m / 6 m / 9 m <table border="1"> <tr> <th>Art. no.</th> <th>Designation</th> </tr> <tr> <td>29011173</td> <td>PC1750-3/C-Box</td> </tr> <tr> <td>29011180</td> <td>PC1750-6/C-Box</td> </tr> <tr> <td>29011181</td> <td>PC1750-9/C-Box</td> </tr> </table>	Art. no.	Designation	29011173	PC1750-3/C-Box	29011180	PC1750-6/C-Box	29011181	PC1750-9/C-Box	Sub-D	<b>Controller for D/A conversion and evaluation of up to 2 sensor signals</b> Dual Processing Unit 			
Art. no.	Designation													
29011173	PC1750-3/C-Box													
29011180	PC1750-6/C-Box													
29011181	PC1750-9/C-Box													

#### Robot-suitable extension cables

Cable diameter: max. 9 mm  
 Drag chain: no  
 Robot: yes  
 Temperature range: -40 ... 70 °C (moving / not moving)  
 Bending radius: 110 mm (dynamic)

Sensor	Cables	Type	Connection possibilities and accessories							
ILD1750-xxBL ILD1750-xxDR ILD1760-1000	<b>Extension cable pigtail:</b> Length 3 m / 6 m / 9 m / 15 m <table border="1"> <tr> <th>Art. no.</th> <th>Designation</th> </tr> <tr> <td>2901494</td> <td>PCR1700-5</td> </tr> <tr> <td>2901299</td> <td>PCR1700-10</td> </tr> </table>	Art. no.	Designation	2901494	PCR1700-5	2901299	PCR1700-10	Open ends	<b>Connection supply voltage</b> PS2020 	
	Art. no.	Designation								
	2901494	PCR1700-5								
2901299	PCR1700-10									
			<b>Interface module from RS422 to USB</b> IF2001/USB IC2001/USB 							
			<b>Interface module for Industrial Ethernet connection</b> IF2035-PROFINET IF2035-EIP IF2035-EtherCAT 							

## Extension cables for high temperatures

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									
ILD1750-xxBL ILD1750-xxDR  ILD1760-1000	<b>Extension cables high temperatures</b> Length 3 m / 6 m / 9 m / 15 m  <table> <tr> <td><i>Art. no.</i></td> <td><i>Designation</i></td> </tr> <tr> <td>29011091</td> <td>PC1700-3/OE/HT</td> </tr> <tr> <td>29011092</td> <td>PC1700-6/OE/HT</td> </tr> <tr> <td>29011094</td> <td>PC1700-15/OE/HT</td> </tr> </table>	<i>Art. no.</i>	<i>Designation</i>	29011091	PC1700-3/OE/HT	29011092	PC1700-6/OE/HT	29011094	PC1700-15/OE/HT	Open ends	<b>Supply voltage connection</b> Power supply unit PS2020 	
		<i>Art. no.</i>	<i>Designation</i>									
		29011091	PC1700-3/OE/HT									
29011092	PC1700-6/OE/HT											
29011094	PC1700-15/OE/HT											
<b>Interface module of RS422 to USB</b> IF2001/USB 												
<b>Interface module for Industrial Ethernet connection</b> IF2035-PROFINET IF2035-EIP IF2035-EtherCAT 												

## 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  (PC1700-x/ IF2008)	<b>Adapter cables for 4-fold sensor connection</b> Length 0.1 m  <table> <tr> <td><i>Art. no.</i></td> <td><i>Designation</i></td> </tr> <tr> <td>2901528</td> <td>IF2008-Y-adapter cable</td> </tr> </table> 	<i>Art. no.</i>	<i>Designation</i>	2901528	IF2008-Y-adapter cable	Sub-D	<b>Interface card for synchronous data acquisition</b> IF2008PCIe / IF2008E 	
		<i>Art. no.</i>	<i>Designation</i>					
2901528	IF2008-Y-adapter cable							
<b>4-fold USB converter &amp; parameter setting</b> IF2004/USB 								

## optoNCDT 1910

see Connection possibilities optoNCDT 1900 on pg. 32.



## Sensors and Systems from Micro-Epsilon



Sensors and systems for displacement, distance and position



Sensors and measurement devices for non-contact temperature measurement



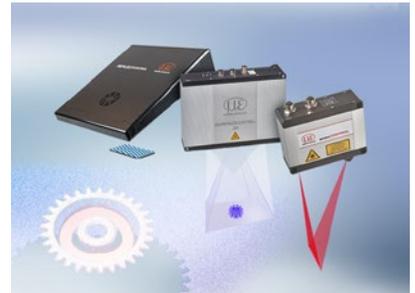
Measuring and inspection systems for metal strips, plastics and rubber



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