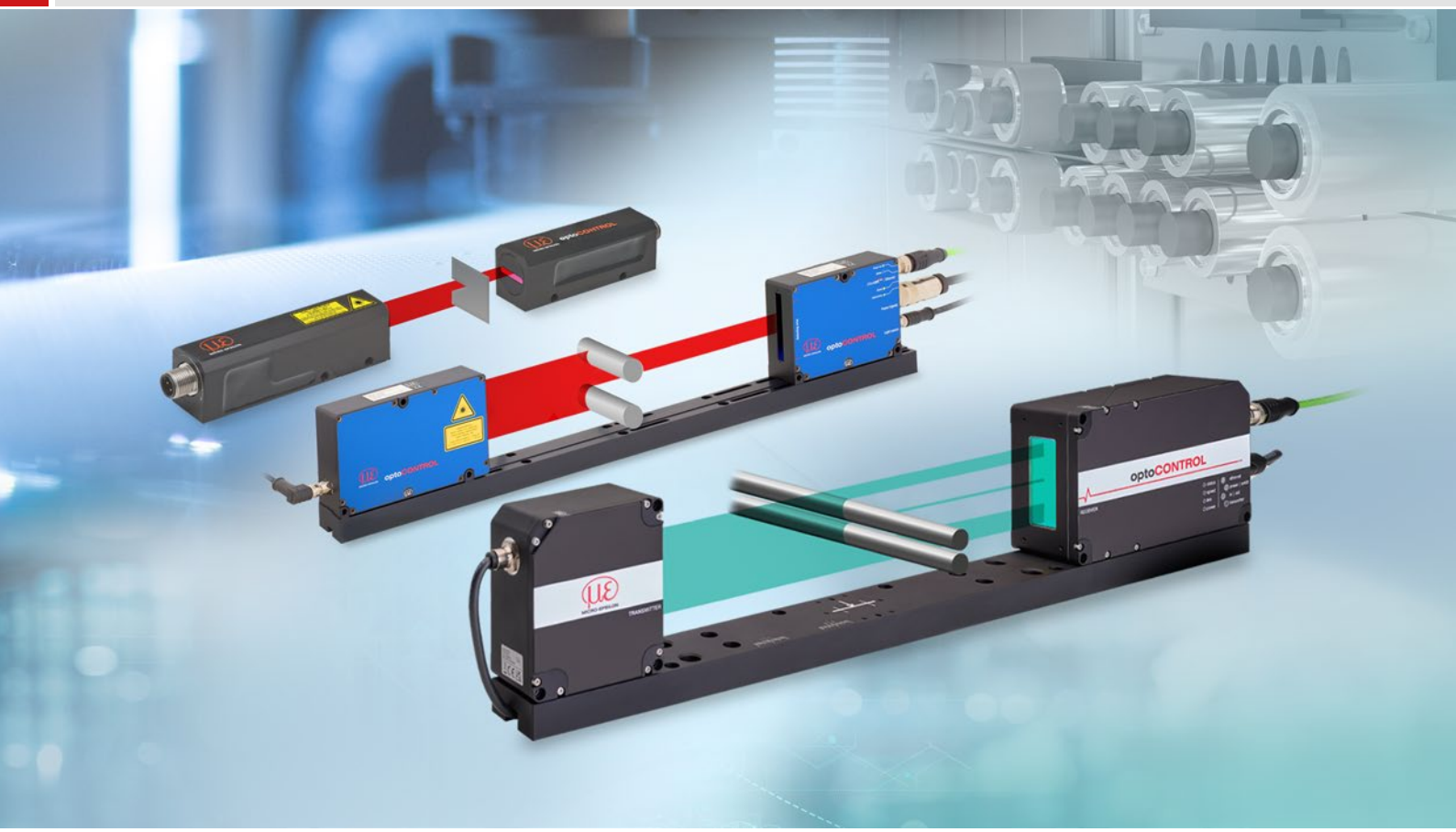
MICRO-EPSILON

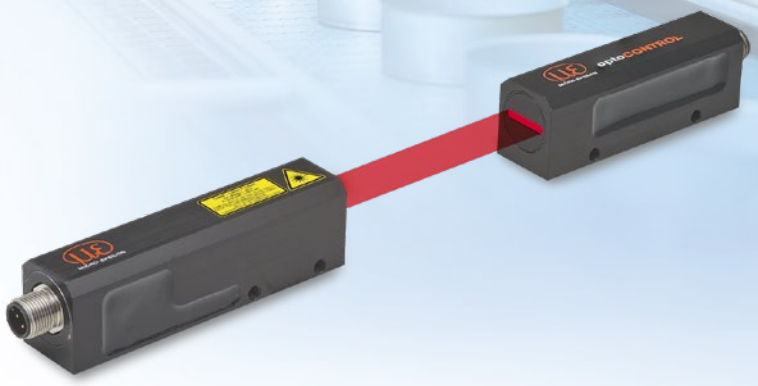
More Precision.

optoCONTROL // Optical precision micrometers



Compact high-speed micrometers
optoCONTROL 1200 / 1201

- Measuring ranges 2–30 mm
- Resolution ≥ 8 µm
- Measuring rate up to 100 kHz (-3 dB)
- INTER FACE Analog output 0 ... 10 VDC
- Laser class 1
- Detection of the smallest objects from 0.03 mm

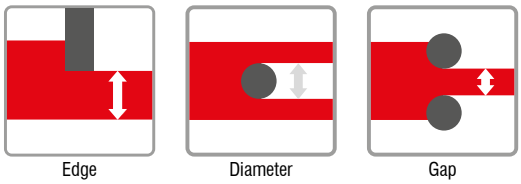


Light source and receiver can be mounted at any distance up to 2.5 m apart. All models can be mounted vertically or horizontally without additional brackets.

The compact housing design and the 90° version enable the miniature micrometers to be mounted even in confined installation spaces. In addition to the analog output, an adjustable limit switch is available. It can be operated in both NPN (light switching) and PNP logic (dark switching).

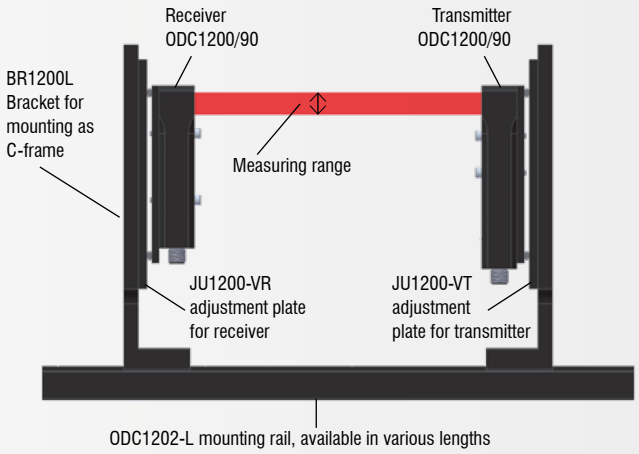
The optoCONTROL 1200 reliably measures diameters as small as 0.3 mm. For gap measurement from 50 µm, an option with intensity-based light quantity measurement is available.

Measurement programs



90°

optoCONTROL 1200/90:
90° beam path version for mounting in confined installation spaces.
Optional mounting using the ODC1202-L mounting rail as a C-frame.

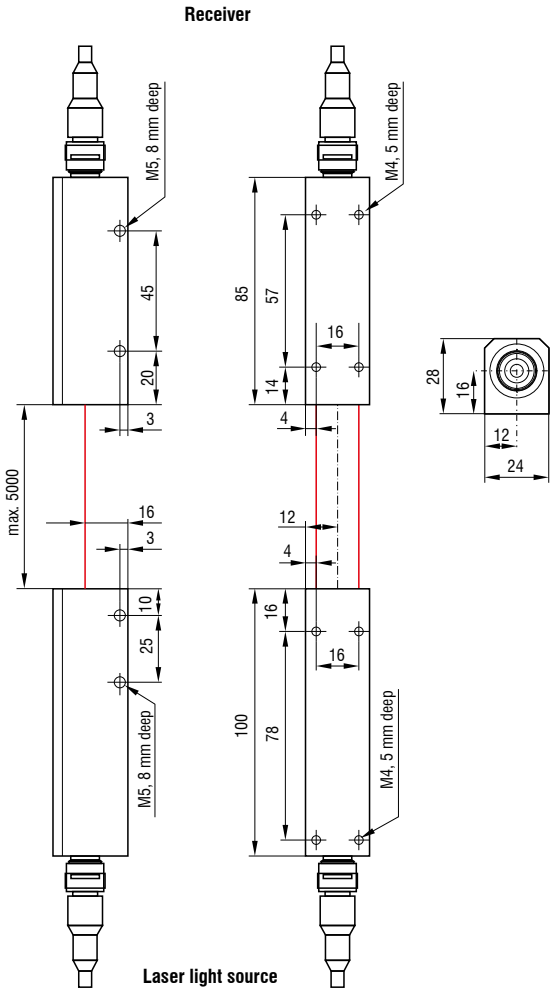


Model		ODC 1200 (axial model)				ODC 1200/90 (90 model)				ODC1201	
Measuring range		2 mm	5 mm	10 mm	16 mm	2 mm [3]	5 mm	10 mm	16 mm	20 mm	30 mm
Min. target size [2]		≥ 0.03 mm	≥ 0.05 mm	≥ 0.1 mm	≥ 0.15 mm	≥ 0.03 mm	≥ 0.05 mm	≥ 0.1 mm	≥ 0.15 mm	≥ 0.15 mm	≥ 0.2 mm
Distance light source - receiver (free space) [1]		min. 30 mm to 150 mm [1] max. 2500 mm									
Measuring distance (measured object - receiver)		20 mm … 2000 mm; Optimum distances: 20, 50 mm [1]									
Measuring rate		100 kHz (-3 db)									
Resolution		8 µm	10 µm	20 µm	30 µm	8 µm	10 µm	20 µm	30 µm	50 µm	70 µm
Linearity [2]		±2 % FSO		±3.5 % FSO		±2 % FSO		±3.5 % FSO			
Repeatability [4] [5]		≤16 µm	≤20 µm	≤40 µm	≤60 µm	≤16 µm	≤20 µm	≤40 µm	≤60 µm	≤100 µm	≤140 µm
Light source		Semiconductor laser 670 nm (red)									
Laser class		Laser class 1 (Pmax ≤ 0.39 mW) according to IEC 60825-1:2014									
Permissible ambient light		≤ 5000 lx [6]									
Analog output		0 ... 10 VDC (adjustable amplification, depending on direction)									
Digital interface		Ethernet [7] , EtherCAT [7] (max. 14 Bit/4 kSa/s)									
Switching output		PNP dark switching and NPN light switching (max. switching frequency 60 kHz) adjustable switching threshold									
Signal input		Laser control (light source) 0 ... 5 VDC									
Connection	Receiver	4-pin M12 socket for power supply, analog and digital output									
	Light source	4-pin socket M12 for supply and laser control									
Mounting		Mounting rail, adjustment plates (see accessories), mounting holes									
Temperature range	Storage	-20 … + 70 °C									
	Operation	0 ... + 50 °C									
Supply voltage		12 … 32 VDC									
Maximum power consumption		< 0.3 A									
Shock (DIN EN 60068-2-27)		15 g / 6 ms									
Vibration (DIN EN 60068-2-6)		15 g / 0.01 … 1 kHz									
Protection class (DIN EN 60529)	Receiver / light source	IP67									
Material	Receiver / light source	Aluminum housing									
Weight	Light source	approx. 150 g				approx. 170 g				approx. 260 g	
	Receiver	approx. 120 g				approx. 160 g				approx. 220 g	
Measuring programs		Edge (outer-) diameter / width gap									
Control and indicator elements		Receiver (LED) indication: switching state indicator and dirt with free beam path Light source (LED) indication: power ON/OFF									
Special features		Measurements server for transmission of several measurements to the PC (optional IF1032/ETH)									

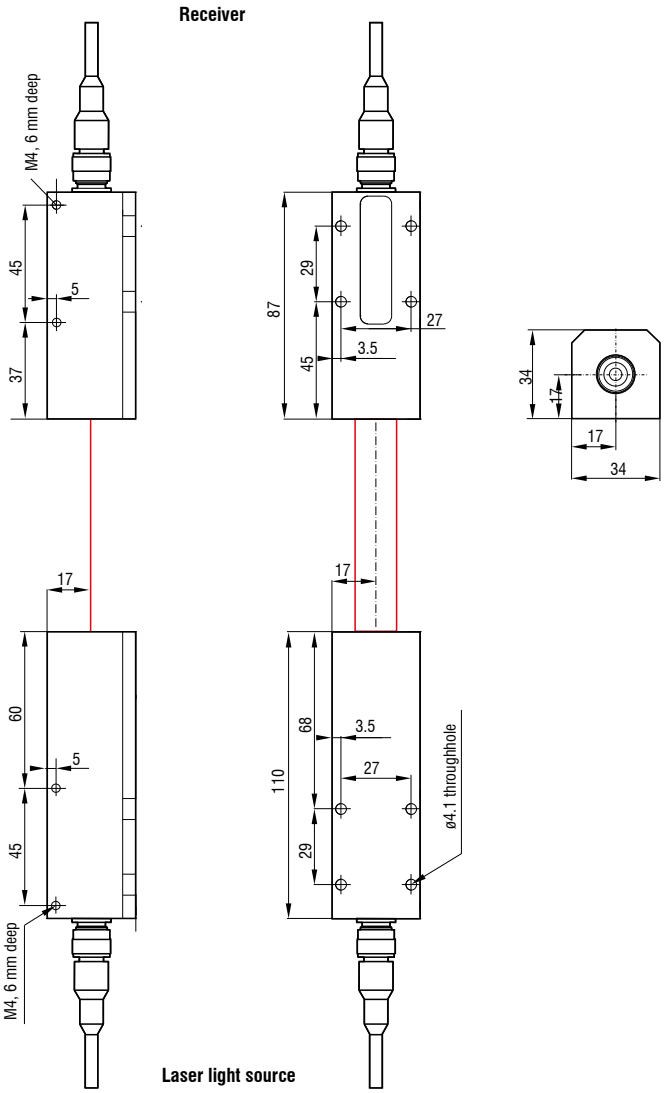
FSO = Full Scale Output
The specified data apply for a constant room temperature of 20 °C after a warm-up period of 180 min, in the range 10 ... 90 %
of the analog output at a distance of 150 mm between light source and receiver without ambient light effect.
Analog offset if laser beam is covered without ambient light < 0.05 V
[1] Linearity and resolution decrease with larger distances.
[2] Applies in the mid of the measuring range for distance: target - receiver 20 mm; distance: light source - receiver 150 mm.
[3] For gap measurement 50 ... 400 µm, an option is available with a regulated controller for transmitted light operation and measurement distance up to 700 mm.
[4] The specified values apply at ±2 sigma
[5] Measured in the mid of the measuring range with static noise over 3 min.
[6] With direct or indirect irradiation, shadowing from daylight increases the stability of the measurement
[7] Connection via interface module (see accessories)

Compact high-speed micrometers
optoCONTROL 1200/1201

optoCONTROL 1200

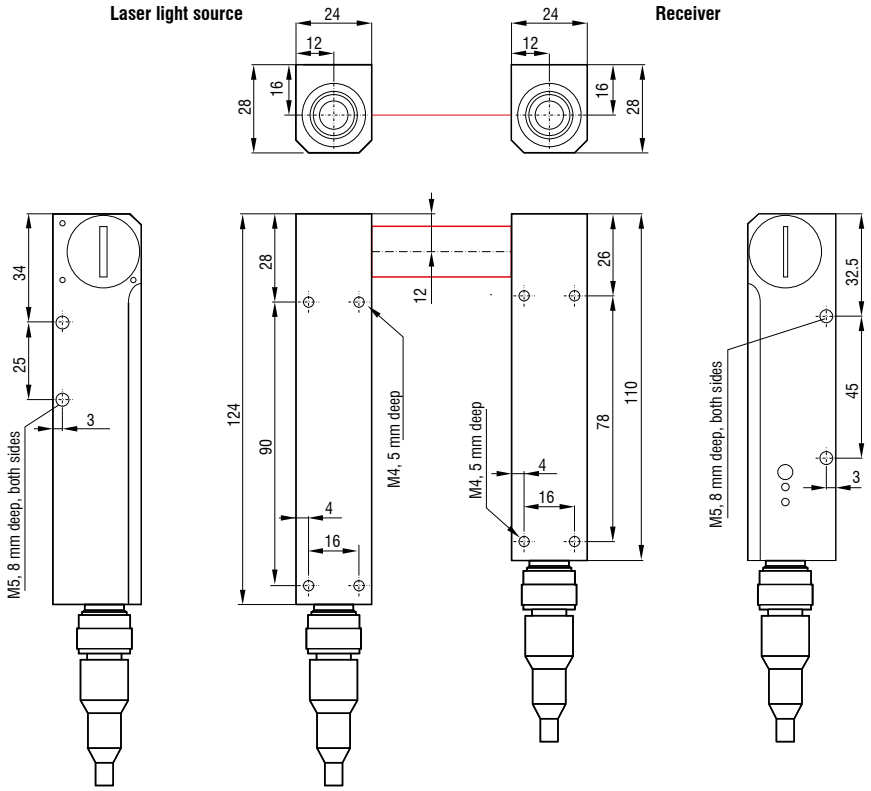


optoCONTROL 1201



(dimensions in mm, not to scale)

optoCONTROL 1200/90



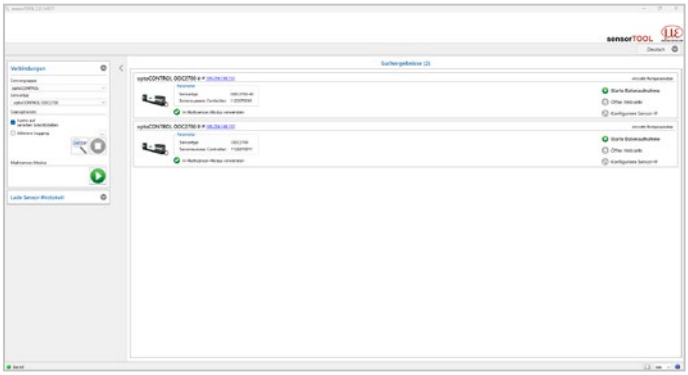
(dimensions in mm, not to scale)

Interface modules and accessories
optoCONTROL

XFrame2520-46 set for 2-axis measurements
ODC2520-46 micrometers for diameter measurement and XY position determination of round stock

- 2-axis frame for X-arrangement of 2 sensors
- Compressed-air cleaning of the optics via an air purge system
- e.g., for wires, cables, tubes, rods or flat steel
- Objects up to 46 mm in diameter can be measured
- Measuring range 46 × 46 mm

The multi-sensor function in sensorTOOL enables multiple optoCONTROL ODC sensors to be connected simultaneously and their measurement values to be viewed together. This enables measurement data from different sensors to be displayed, compared, recorded, and exported within a single interface. This is especially useful for multi-channel or combined measurement tasks, because all relevant values can be clearly displayed in a single chart.



Interface modules

Module	ODC1200	ODC2520	ODC2700
IF2001/USB RS422/USB converter to transform a digital signal to USB	⊘	✔	✔
IC2001/USB Single-channel RS422/USB converter cable	⊘	✔	✔
IF2004/USB RS422/USB converter for converting up to 4 digital signals to USB	⊘	✔	✔
IF2008/ETH Interface module for Ethernet connection for up to 8 sensors	⊘	✔	✔
IF2008PCIE Interface card for processing multiple sensor signals; analog and digital interfaces	✔	✔	✔
IF2035-EtherCAT Interface module for Industrial Ethernet connection (EtherCAT)	⊘	✔	✔
IF2035/PROFINET Interface module for Industrial Ethernet connection (PROFINET)	⊘	✔	✔
IF2035/EtherNetIP Interface module for Industrial Ethernet connection (EtherNet/IP)	⊘	✔	✔
IF1032/ETH Interface module for connecting the analog interface to Ethernet or Industrial Ethernet (EtherCAT)	✔	⊘	⊘
Dual Processing Unit Controller for D/A conversion and processing of up to 2 sensor signals	⊘	✔	✔

Interface modules and accessories
optoCONTROL

IF2001/USB: RS422-to-USB converter

The RS422/USB converter converts the digital signals from an optical micrometer into a USB data packet. To do this, the sensor is connected to the converter's RS422 interface. The data are output via the USB interface; additional signals and functions such as Laser On/Off, switching signals, and the function output are passed through by the converter. The converter and the connected sensors can be parameterized via software.

Special features

- Robust aluminum housing
- Easy sensor connection via screw terminals (Plug & Play)
- RS422-to-USB conversion
- Supports baud rates from 9.6 kBaud to 12 MBaud

IC2001/USB: Single-channel converter cable RS422/USB

The IC2001/USB single-channel converter cable is used to connect optoCONTROL sensors with an RS422 interface to USB. The cable is easy to install and therefore also suitable for integration into machines and systems.

Special features

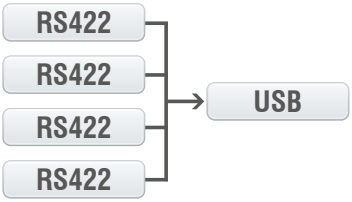
- 5-core interface cable without outer shield
- RS422-to-USB conversion
- Easy sensor connection via USB
- Supports baud rates from 9.6 kBaud to 1 MBaud

IF2004/USB: 4-channel RS422/USB converter

The RS422/USB converter converts the digital signals from up to 4 optical precision micrometers into a USB data packet. The converter features 4 trigger inputs and a trigger output for connecting additional converters. The data are output via a USB interface. The converter and the connected sensors can be parameterized via software. The COM interfaces can be used individually and switched as required.

Special features

- 4 digital signals via RS422
- 4 trigger inputs, 1 trigger output
- Synchronous data acquisition
- Data output via USB



IF2008/ETH

IF2008/ETH interface module for Ethernet connection for up to 8 sensors

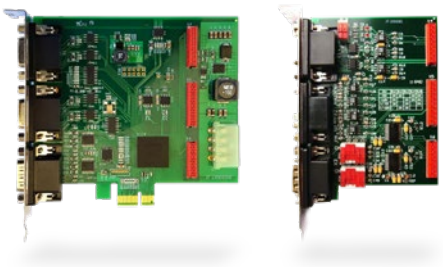
The IF2008/ETH integrates up to eight sensors and/or encoders with an RS422 interface into an Ethernet network. Four programmable switching inputs/outputs (TTL and HTL logic) are available.

Both the channel and the device status can be read directly on the module via the ten indicator LEDs. Data acquisition and output via Ethernet are also performed at a high speed of up to 200 kHz. Parameter setting of the interface module can be easily done via the web interface.

IF2008PCIe/IF2008E

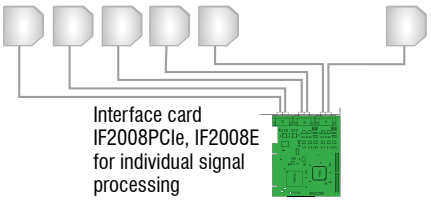
Interface card for synchronous data acquisition

Fully synchronous data acquisition is critical when measuring deflection or straightness with multiple optical micrometers. The IF2008PCIe interface card is designed for installation in PCs and enables the synchronous capture of 4 digital sensor signals and 2 encoders. The data are stored in a FIFO memory to enable resource-efficient block processing on the PC. With the IF2008E expansion card, an additional 2 digital sensor signals, 2 analog sensor signals and 8 I/O signals can be captured.



Special features

- IF2008PCIe – Basic board: 4 digital signals and 2 encoders
- IF2008E – Expansion board: 2 digital signals, 2 analog signals and 8 I/O signals



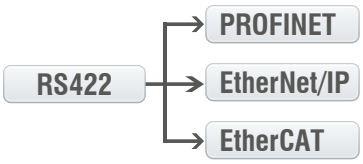
IF2035

Interface module for Industrial Ethernet connection

The IF2035 series interface modules were developed for easy connection of Micro-Epsilon sensors to Ethernet-based fieldbuses. The IF2035 is compatible with sensors that output data via an RS422 or RS485 interface and supports the common Industrial Ethernet protocols EtherCAT, PROFINET and EtherNet/IP.

The modules operate on the sensor side with up to 4 MBaud and have two network connections for different network topologies. In addition, the IF2035-EtherCAT offers a 4-fold oversampling function, which enables faster measurements than permitted by the bus cycle when required. Installation in control cabinets is via a DIN rail.

EtherNet/IP
PROFINET
EtherCAT



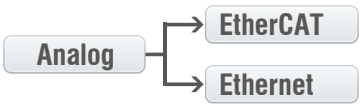
IF1032/ETH

With the IF1032/ETH interface module, the proven operating concept with web interface is now also available for optical micrometers with analog interfaces. Measurement data can be conveniently displayed on a PC via the Ethernet interface. In addition, optical micrometers can be connected to an EtherCAT bus. The existing RS485 interface allows connection of new optical precision micrometers that use the Micro-Epsilon-specific RS485 protocol.

EtherCAT

Interfaces

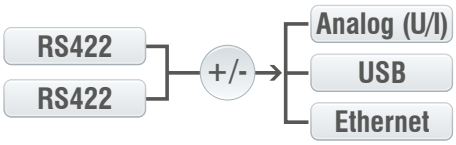
- Ethernet/EtherCAT
- 1x RS485 (ME proprietary protocol)
- 2x analog-in (14 bit, max. 4 ksps), voltage
- 1x analog-in, (14 bit, max. 4 ksps), current
- Inputs for supply voltage
- Trigger input
- EtherCAT synchronization output
- Output for sensor power supply



Interface modules and accessories
optoCONTROL

Dual Processing Unit: Controller for D/A conversion and processing of up to 2 sensor signals

- Fast D/A conversion (16-bit, up to 100 kHz) of 2 digital input signals or processing of 2 digital sensor signals
- Averaging functions and calculation of thickness, step, diameter, ovality and runout
- Trigger input
- Multi-function output
- Output of measurement values via Ethernet, USB, analog output 4 ... 20 mA/ 0 ... 5 V / 0 ... 10 V / ±5 V / ±10 V (scalable via the web interface)
- 2 x switching outputs for sensor or Dual Processing Unit status
- Parallel data output via three output interfaces
- Two filter options
- Post-linearization of measurement values or calculated values
- Simple parameterization via web interface (controller and sensors)



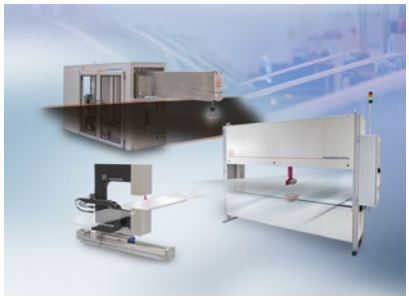
optoCONTROL 1200/1201

Connection	Interface modules	Connection cables	Mounting	Accessories
Power supply Power supply PS2031 2420096 Power supply unit PS2020 2420062 		**Power supply and signal cables** PC1200/90-5 (5 m) (90°) 2901261 PC1200-5 (5 m) 2901260 PC1200-10 (10 m) 2901483		**Adjustment plate** <u>Receiver</u> JU1200-HR (horizontal) 2966018 JU1200-VR (vertical) 2966019 <u>Transmitter</u> JU1200-VT (vertical) 2966020 JU1200-HT (horizontal) 2966021 (for 1200 and 1200/90)
Digital output / Ethernet / EtherCAT 	IF1032/ETH 2420066 max. 4 kSps 			
PLC analog Connection via 0 … 10 V 	Direct 0–10 VDC		**C-frame mounting rail** ODC1202-L100 (L = 0.4 m) 2966006 ODC1202-L200 (L = 0.5 m) 2966007 ODC1202-L500 (L = 0.8 m) 2966008 (for 1200 and 1200/90)	**Bracket for C-frame mounting** BR1200L220 (L=220 mm) 2966024 BR1200L320 (L=320 mm) 2966025

Sensors and Systems from Micro-Epsilon

Sensors and systems for displacement, distance and position

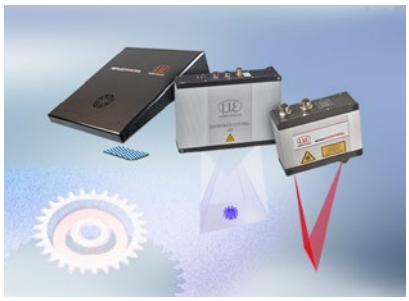
Sensors and measurement devices for non-contact temperature measurement



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 / Y9761284-H012096GKE

MICRO-EPSILON

MICRO-EPSILON Eltrotec GmbH
Manfred-Wörner-Straße 101 · 73037 Göppingen / Germany
Tel. +49 (0)7161 98872-300 · Fax+49 (0)7161 98872-303
eltrotec@micro-epsilon.de · **www.micro-epsilon.com**