



More Precision

optoCONTROL // Optical precision micrometers

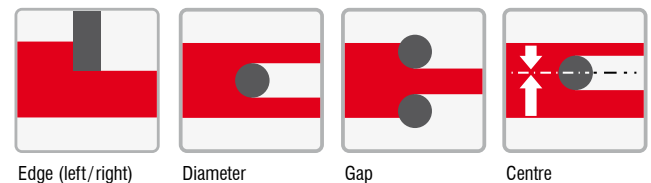




| | |
|--|-----------------------------|
| | Measuring range 28mm |
| | Resolution typ. 2µm |
| | Repeatability typ. ±4µm |
| | Analogue output 0 ... 10VDC |
| | Serial interface RS232 |
| | Laser class 1 |

- ▶ Visible laser line (red light 670nm)
- ▶ Working distance of up to 2,000mm
- ▶ Integrated interference filter
- ▶ CCD line detector with 2,048 pixels, 16,384 sub-pixels (8-fold)
- ▶ 2 digital inputs, 2 digital outputs
- ▶ Robust aluminium housing suitable for industrial use

Measurement mode (programmable via software)



Edge (left/right)

Diameter

Gap

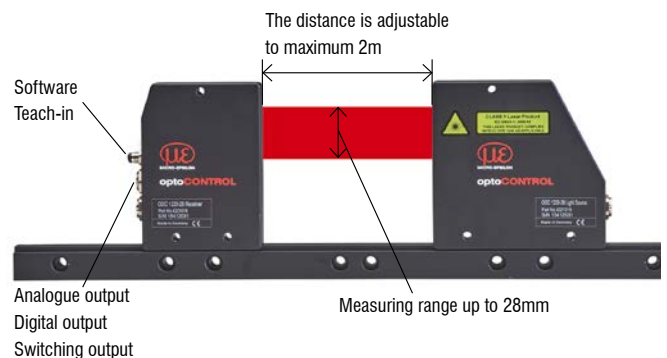
Centre

Measuring principle

The laser beam for the optoCONTROL 1220 laser micrometers is output from the optical transmitter as a parallel aimed laser beam. The laser line strikes a CCD array in the receiving optical system. The amount of light collected by each of these receiving elements during the integration time is read out separately as analogue voltage and stored as a digital value in a data field after analogue-to-digital conversion. If there is a non-transparent measurement object in the laser line, only the receiving elements of the lines outside the shadow zone of the measurement object are illuminated. As the spacing of the pixels of the CCD array is known, the size and position of the measurement object can be determined.

System design

optoCONTROL 1220 series is specifically designed for measuring edges, diameters and gaps of up to 2,000mm. The laser micrometer consists of a light source and a receiving unit. The complete controller electronics are integrated in the receiver housing. The light source and receiver can be installed at any distance from each other. All models can be installed without additional brackets in both vertical and horizontal positions.



| Model | ODC1220-28 |
|----------------------------------|--|
| Measuring range | typ. 28mm |
| Distance light source - receiver | min. 20mm to max. 2000mm |
| Resolution | typ. 2µm |
| Repeatability ¹⁾ | typ. ±4µm |
| Linearity ²⁾ | typ. ±0.08% [typ. ±22µm] |
| Measuring rate | max. 200Hz |
| Max. switching current | 100mA, short-circuit proof |
| Interface | Measurement values via RS232, parametrizable under Windows using the ODC1202 tool (included in scope of supply) |
| Laser | semiconductor laser, 670nm, DC-operation, ≤0.39mW max. opt. power, laser class 1 ³⁾ the use of these laser sensors therefore requires no additional protective measures |
| Optical filter | interference filter, RG645; polarisation filter |
| Housing material | aluminium, anodised in black |
| Connector receiver | 8-pin female connector type binder series 712 (SPS/Power); 4-pin M5 female connector type binder series 707 (RS232/PC) |
| Connector light source | 4-pin female connector type binder 712 (connection to receiver)) |
| Connection cable | connection to PC: SCD1202 (RS232) or SCD12xx (USB version incl. driver) Power and connection to SPS: SCA1202; connection cable light source/receiver: CE1220 |
| Output polarity | bright/dark-switching, adjustable using Windows |
| LED-indication | LED red (+) : measured value > upper tolerance threshold; LED green : measured value lies within tolerance window LED red (-) : measured value < lower tolerance threshold; LED yellow : Power-LED (multifunction) |
| EMC | IEC 60947-5-2 |
| Protection class | electronics: IP54, optics: IP67 |
| Operation temperature range | -10°C ... +50°C |
| Storage temperature range | -20°C ... +85°C |
| Analogue output (ANA) | 1x voltage output 0 ... +10V (scalable) |
| Digital outputs (OUT0, OUT1) | OUT0: (-) measured value < lower tolerance threshold; OUT1: (+) measured value > upper tolerance threshold pnp bright-switching/npn dark-switching or pnp dark-switching/npn bright-switching, adjustable using Windows®, 100mA, short-circuit proof |
| Digital inputs (IN0, IN1) | IN0: external trigger, IN1: teach/reset (double function); input voltage +Ub/0V with protective circuit |
| Power supply | +24VDC (± 10%) |
| Sensitivity adjustment | using Windows® via PC (parameterization software included) |
| Laser adjustment | adjustable under Windows® via PC |
| Consumption | typ. 200mA |
| Mounting rail | ODC1220-L220/L420/L620 (max. distance light source - receiver ≤ 220/420/620mm) |

All specifications are measured at a constant temperature of 20 °C after a warm-up time of 30 minutes.

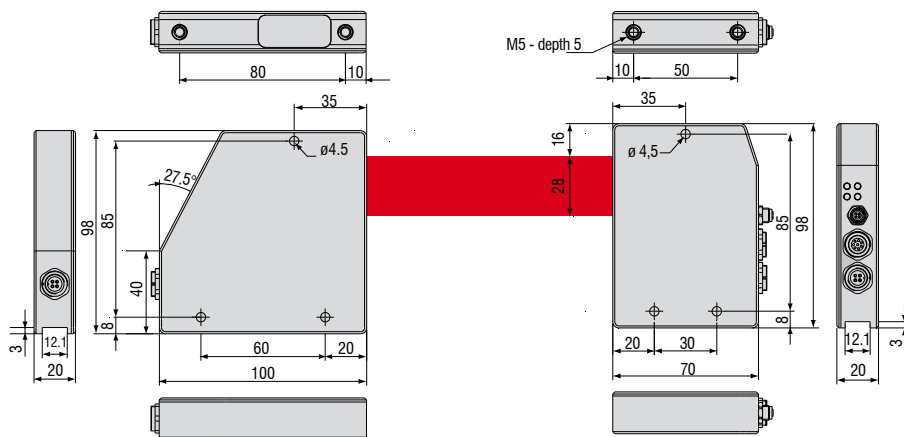
¹⁾ Valid for ΔT ≤ 5°C and ambient light 5000lx. For stable measurement shadowing of the receiver is advisable. Smooth video AVG 64 values.

²⁾ Is only valid with the adaption of the threshold and the laser performance as well as the execution of an calibration; 20mm target-receiver distance; 250mm transmitter-receiver distance

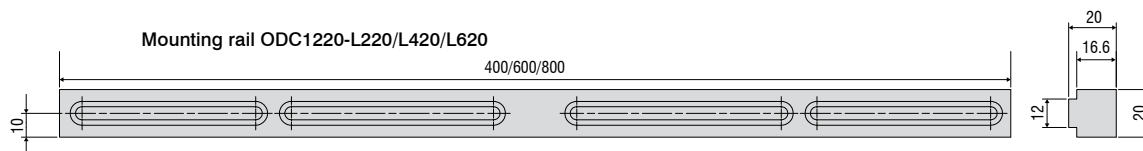
³⁾ Laser class 1: IEC 60825-1: 2008-05

ODC1220-28-T (light source)

ODC1220-28-R (receiver)



Mounting rail ODC1220-L220/L420/L620



IF2008 - PCI interface card

Particular benefits

- 4x digital signals and two encoders with basic printed circuit board
- Additional expansion board for a total of 6x digital signals, 2x encoder and 2x analogue signals and 8x I/O Signals
- FIFO data memory
- Synchronous data acquisition



Example: measurement of diameters with two optoCONTROL. The diameter to be measured can be increased using two optoCONTROL. See CSP2008 universal controller.

IF2008E - Expansion board

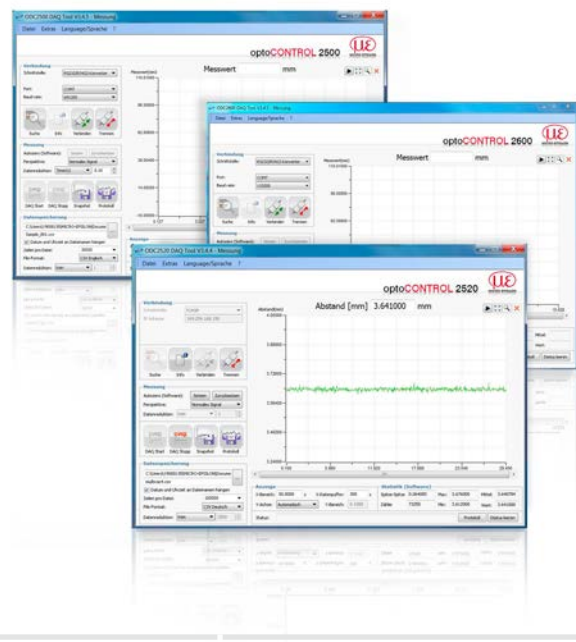
Particular benefits

- Two digital signals, two analogue signals and 8 I/O signals
- Overall with IF2008: 6 digital signals, 2 encoders and 2 analogue signals and 8 I/O signals
- FIFO data memory
- Synchronous data acquisition



Diverse ODC tools

Depending on the sensor, diverse tools for continuous measurement value recording and parameter set up are available free of charge.

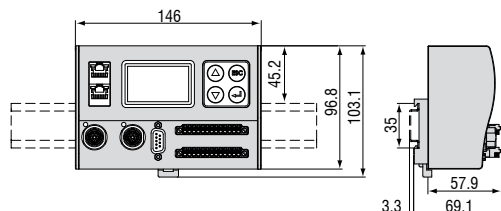


CSP2008 - Universal controller for up to six sensor signals

The controller CSP2008 has been designed to process 2 to 6 both optical and other sensors from Micro-Epsilon (6 digital or 4 analogue input signals max., 2x internal + 4x external via EtherCAT modules from the company Beckhoff. EtherCAT is intended as external bus for connecting further sensors and I/O modules. The controller is equipped with a display offering multicolour backlighting which changes its colour in the case of exceeding the limit value while a signal is displayed.

Features

- Real-time processing of input and output signals at up to 100kHz (user selectable)
- Unique user interface for the configuration of the controller via Ethernet on a PC or laptop. All user selectable functions of the controller and the measured values can be viewed, displayed and stored in real time via your own web browser without installing any 3rd part software
- Simple sensor connection with automatic sensor recognition, configuration of the sensor using buttons and display on controller or via web browser
- Modular system upgradable with additional I/O modules for customer-specific requirements. The internal communication between I/O components using EtherCAT connection (CSP 2008 acts as master)
- Extremely flexible and powerful functionality; function modules can be combined in many ways.
- Simple mounting using DIN rail TS 35



Universal controller with DIN rail TS 35
(dimensions not to scale)

IF1032/ETH

The IF1032/ETH interface module now enables to run sensors equipped with analogue interfaces with the proven operating concept based on a web interface. The Ethernet interface permits to easily display the measured data on a PC. Moreover, sensors can be connected to an EtherCAT bus. The RS485 interface allows to connect new sensors that use the Micro-Epsilon specific RS485 protocol.

Interfaces

- 1x RS485 (ME-internal protocol)
- 2x analogue-in (14 bit, max. 4 ksps), voltage
- 1x analogue-in, (14 bit, max. 4 ksps), current
- Inputs for supply voltage
- Trigger input
- EtherCAT synchronisation output
- Output for sensor power supply



Accessories optoCONTROL 1200/1201

| Article number | Model | Description |
|----------------|---------------|---|
| 2901260 | PC1200-5 | Power supply and signal cable 5m, straight connector, for light source and receiver unit |
| 2901483 | PC1200-10 | Power supply and signal cable 10m, straight connector, for light source and receiver unit |
| 2901261 | PC1200/90-5 | Power supply and signal cable 5m, angled connector, for light source and receiver unit |
| 0260031.11 | DD241PC(11)-U | Digital display unit, RS232, connection for 1 analogue sensor 0-10V, 2 limit switches |
| 2420066 | IF1032/ETH | ME Ethernet/EtherCAT interface module max.14Bit/4k samples/sec |
| 2966006 * | ODC1202-L100 | Mounting rail for ODC1202, 400mm; distance light source/receiver max.100mm |
| 2966007 * | ODC1202-L200 | Mounting rail for ODC1202, 500mm; distance light source/receiver max. 200mm |
| 2966008 * | ODC1202-L500 | Mounting rail for ODC1202, 800mm; distance light source/receiver max. 500mm |
| 2966018 | JU1200-VR | ODC1200 adjustment plate for vertical mounting of the receiver |
| 2966019 | JU1200-HR | ODC1200 adjustment plate for horizontal mounting of the receiver |
| 2966020 | JU1200-VT | ODC1200 adjustment plate for vertical mounting of the transmitter |
| 2966021 | JU1200-HT | ODC1200 adjustment plate for horizontal mounting of the transmitter |
| 2966024 | BR1200L220 | Bracket for mounting as C-frame, length 220mm, 2 pcs. required |
| 2966025 | BR1200L320 | Bracket four mounting as C-frame, height 320mm, 2 pcs. required |

*only for C-frame mounting combined with adjustment plate JU1200 and bracket BR1200

Accessories optoCONTROL 1202

| | | |
|---------|-----------------|---|
| 2901497 | CE1202-2 | Connecting cable light source-receiver, 2m |
| 2901482 | CE1202-5 | Connecting cable light source-receiver, 5m |
| 2901371 | SCD1202-2-RS232 | Digital output cable, 2m, for connection to a RS232 port |
| 2901509 | SCD1202-5-RS232 | Digital output cable, 5m, for connection to a RS232 port |
| 2901848 | SCD12xx-2-USB | Digital output cable for USB connection incl. driver, 2m |
| 2901373 | SCA1202-2 | Power supply and analogue output cable, 2m |
| 2901510 | SCA1202-5 | Power supply and analogue output cable, 5m |
| 2966006 | ODC1202-L100 | Mounting rail for ODC1202, 400mm; distance light source/receiver max.100mm |
| 2966007 | ODC1202-L200 | Mounting rail for ODC1202, 500mm; distance light source/receiver max. 200mm |
| 2966008 | ODC1202-L500 | Mounting rail for ODC1202, 800mm; distance light source/receiver max. 500mm |
| 6414114 | EK1100/CSP2008 | Bus terminal |
| 6414107 | EL3162/CSP2008 | Bus terminal; 2-channel analogue input terminal |
| 2420057 | CSP2008 | Universal controller for displacement sensors |
| 2420066 | IF1032/ETH | ME Ethernet/EtherCAT interface module max.14Bit/4k samples/sec |

Accessories optoCONTROL 1220

| | | |
|---------|-----------------|---|
| 2901871 | CE1220-1 | Connecting cable light source-receiver, 1m |
| 2901851 | CE1220-2 | Connecting cable light source-receiver, 2m |
| 2901852 | CE1220-5 | Connecting cable light source-receiver, 5m |
| 2901371 | SCD1202-2-RS232 | Digital output cable, 2m, for connection to a RS232 port |
| 2901509 | SCD1202-5-RS232 | Digital output cable, 5m, for connection to a RS232 port |
| 2901848 | SCD12xx-2-USB | Digital output cable for USB connection incl. driver, 2m |
| 2901373 | SCA1202-2 | Power supply and analogue output cable, 2m |
| 2901510 | SCA1202-5 | Power supply and analogue output cable, 5m |
| 2966009 | ODC1220-L220 | Mounting rail for ODC1220, 400mm; distance light source/receiver max. 220mm |
| 2966011 | ODC1220-L420 | Mounting rail for ODC1220; 600mm; distance light source/receiver max. 420mm |
| 2966012 | ODC1220-L620 | Mounting rail for ODC1220; 800mm; distance light source/receiver max. 620mm |
| 6414114 | EK1100/CSP2008 | Bus terminal |
| 6414107 | EL3162/CSP2008 | Bus terminal; 2-channel analogue input terminal |
| 2420057 | CSP2008 | Universal controller for displacement sensors |
| 2420066 | IF1032/ETH | ME Ethernet/EtherCAT interface module max.14Bit/4k samples/sec |

Accessories optoCONTROL 2500/2600

| | | |
|---------|--------------------|---|
| 2901123 | PC2500-3 | Power supply cable 3m, open |
| 2901124 | PC2500-10 | Power supply cable 10m, open |
| 2901120 | SCA2500-3 | Signal output cable, analogue, 3m |
| 2901215 | SCA2500-10 | Signal output cable, analogue, 10m |
| 2901121 | SCD2500-3/3/RS232 | Signal output cable, 3m, analogue / RS232 |
| 2213017 | IF2008 | PCI interface card RS422 |
| 2213018 | IF2008E | Expansion board analogue / RS422 / PCI |
| 2901122 | SCD2500-3/10/RS422 | Signal output cable, 3m, analogue / RS422, 10m |
| 2901057 | CE1800-3 | Sensor cable extension for camera, 3m |
| 2901118 | CE2500-3 | Sensor cable extension for light source, 3m |
| 2901058 | CE1800-8 | Sensor cable extension for camera, 8m |
| 2901119 | CE2500-8 | Sensor cable extension for light source, 8m |
| 2420057 | CSP2008 | Universal controller for up to six sensor signals |
| 2901504 | SCD2500-3/CSP | Output cable, 3m, for connection to CSP2008 |
| 2901505 | SCD2500-10/CSP | Output cable, 10m, for connection to CSP2008 |

Accessories optoCONTROL 2500/2600

| | | |
|----------|---------------------------|--|
| 2964022 | MBC300 | Assembly block for controller ODC2500/2600 |
| 2213024 | IF2004/USB converter | 4 channel RS422/USB converter |
| 2213025 | IF2001/USB converter | IF2001/USB converter RS422 to USB |
| 2213022 | RS-422/USB converter | Industrial converter for ODC2xxx sensors, RS-422/USB |
| 29011111 | SCD2500-3/RS422 | Output cable RS422, 3m, open ends |
| 2901528 | IF2008-Y adaptation cable | Adaptation cable, Y-type, 100mm |
| 2901561 | SCD2500-3/IF2008 | Interface cable |
| 2901563 | SCD2500-8/IF2008 | Interface cable |
| 6414071 | Extension clamp | Extension clamp RS422 to CSP2008 |

Accessories optoCONTROL 2520

| | | |
|------------|---------------------------|--|
| 2901925 | SCD2520-3 | Digital output cable, 3m, RJ45/ Ethernet/EtherCAT |
| 29011002 | SCD2520/90-5 | Digital output cable, 5m, RJ45/ Ethernet/EtherCAT |
| 29011042 | SCD2520/90-8 | Digital output cable, 8m, RJ45/ Ethernet/EtherCAT |
| 29011003 | PC/SC2520/90-5 | Supply-, interface- and signal cable, 5m |
| 2901918 | PC/SC2520-3 | Supply-, interface- and signal cable, 3m |
| 29011037 | PC/SC2520-10 | Supply-, interface- and signal cable, 10m |
| 29011038 | PC/SC2520-20 | Supply-, interface- and signal cable, 20m |
| 29011039 | PC/SC2520-30 | Supply-, interface- and signal cable, 30m |
| 29011040 | SCD2520-5 M12 | Digital output cable Ethernet/EtherCAT, 5m |
| 2901919 | CE2520-1 | Connecting cable light source-receiver, 1m |
| 2901920 | CE2520-2 | Connecting cable light source-receiver, 2m |
| 2901921 | CE2520-5 | Connecting cable light source-receiver, 5m |
| 2901922 | CE2520/90-1 | Connecting cable light source-receiver, 1m |
| 2901923 | CE2520/90-2 | Connecting cable light source-receiver, 2m |
| 2901924 | CE2520/90-5 | Connecting cable light source-receiver, 5m |
| 2901967 | PC/SC2520-3/CSP | Interface and supply cable for CSP2008 |
| 29011014 | PC/SC2520-3/IF2008 | Interface and supply cable for IF2008 |
| 2213024 | IF2004/USB converter | 4 channel RS422/USB converter |
| 2213022 | RS-422/USB converter | Industrial converter for ODC2xxx sensors, RS-422/USB |
| 2213025 | IF2001/USB converter | Single channel RS422/USB converter |
| 0260031.10 | DD241PC(10)-U | Digital process display, 0...10V |
| 0260031.11 | DD241PC(11)-U | Digital process display, 2 limit switches, 0...10V |
| 2213017 | IF2008 | PCI interface card RS422 |
| 2213018 | IF2008E | Expansion board analogue / RS422 / PCI |
| 2901528 | IF2008-Y adaptation cable | Adaptation cable, Y-type, 100mm |
| 2420057 | CSP2008 | Universal controller for displacement sensors |
| 6414071 | Extension clamp | Extension clamp RS422 to CSP2008 |
| 6414113 | EK1122/CSP2008 | 2 port RJ45 EtherCAT junction |
| 6414114 | EK1100/CSP2008 | Bus terminal |

Accessories power supplies

| | | |
|---------|--------|--|
| 2420065 | PS2030 | Wall power supply 24V/24W/ 1A; 2m-PVC; clamp |
| 2420062 | PS2020 | Power supply for DIN rail mounting 24VDC / 2.5A |
| 2420042 | PS2011 | Power supply for laboratory use 230VAC/ 24VDC / 5.2A |

Further cable lengths on request.



Laser radiation
Do not view directly with
optical instruments
Class 1M Laser Product
IEC 60825-1: 2008-05
 $P \leq 2\text{mW}$, $E \leq 0.2\text{mW/cm}^2$; $\lambda = 670\text{nm}$

optoCONTROL 2520 use a semiconductor class 1M laser with a wavelength of 670nm. The maximum optical output power is $\leq 2\text{mW}$. This laser class does not require any additional protection equipment. Be careful with the dazzling effect related to optical instruments.



Class 1 Laser Product
IEC 60825-1: 2008-05

optoCONTROL 12xx and 2500 use a semiconductor class 1 laser with a wavelength of 670nm. The maximum optical output power is $\leq 0.39\text{ mW}$. This laser class does not require any additional protection equipment.

High performance sensors made by Micro-Epsilon



Sensors and systems for displacement and position



Sensors and measurement devices for non-contact temperature measurement



2D/3D profile sensors (laser scanner)



Optical micrometers, fibre optic sensors and fibre optics



Colour recognition sensors, LED analyzers and colour online spectrometer



Measurement and inspection systems