



More Precision

optoCONTROL // Optical precision micrometers





| | |
|--|------------------------------------|
| | Measuring range 2 - 30mm |
| | Resolution $\geq 10\mu\text{m}$ |
| | Measuring rate up to 100kHz (-3dB) |
| | Analogue output 0 ... 10VDC |
| | Laser class 1 |

- ▶ High quality glass lense optics
- ▶ Robust and compact design with integrated controller
- ▶ Limit switch with up to 60kHz switching frequency
- ▶ Axial and radial design

Measuring principle

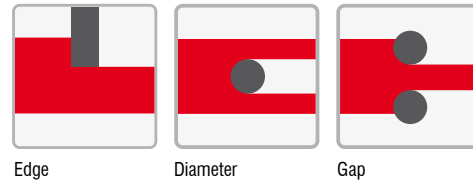
The optoCONTROL 1200 is based on the principle of light quantity measurement. The light of a red laser diode is spread out by a lens to a parallel light curtain which is aimed at the receiving unit. In the receiving unit, the light is guided via various filters and lenses through a precision shutter to a light-sensitive detector. The amount of occurring light is provided by analogue electronics and output as an analogue signal.

System design

optoCONTROL 1200 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 up to 5 meters from each other. All models can be installed without additional brackets in both vertical and horizontal positions. The compact design of the housing and the 90° version also enable easy mounting of the miniature micrometers in tight installation spaces.

As well as the analogue output, an adjustable limit switch is also available. This can be operated both as NPN (bright switching) as well as in PNP logic (dark switching).

Measurement mode

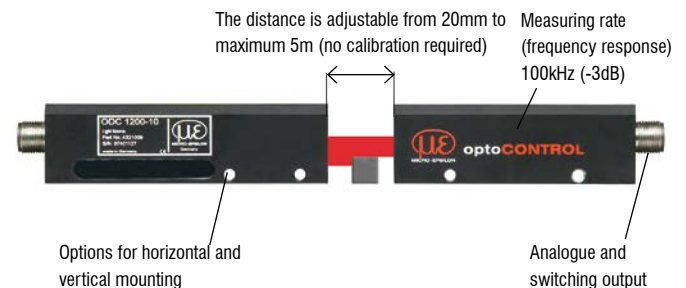


Edge

Diameter

Gap

The target must be positioned inside the measuring window for the diameter measurement. Smallest diameter typ. $>0.3\text{mm}$. For gap measurement from 50 - 400 μm there is an option using light quantity measurement.



optoCONTROL 1200/90:
Version with 90° beam path for mounting in tight spaces



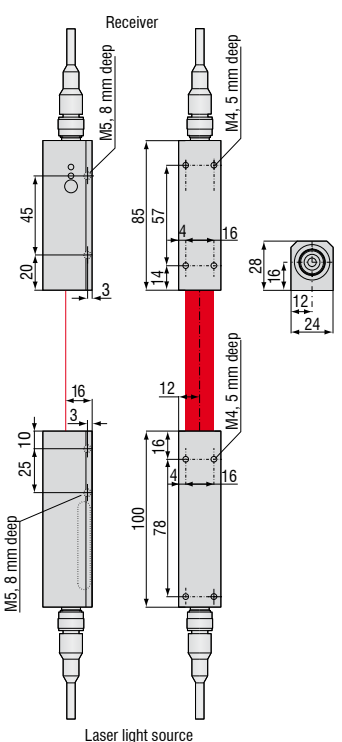
| Model | ODC1200 (axial model) | | | | ODC 1200/90 (90° model) | | | | ODC1201 | | |
|---|--|------------|-----------|------|-------------------------|------------|-----------|------|----------|------------|----------|
| Measuring range | 2mm | 5mm | 10mm | 16mm | 2mm ²⁾ | 5mm | 10mm | 16mm | 20mm | 30mm | |
| Distance light source - receiver (free space) ¹⁾ | min. 20mm to max. 5m | | | | | | | | | | |
| Linearity | ±2% FSO | | ±3,5% FSO | | ±2% FSO | | ±3,5% FSO | | | | |
| Resolution (dynamic) typ. | 10µm | 25µm | 50µm | 80µm | 10µm | 25µm | 50µm | 80µm | 100µm | 150µm | |
| Measuring rate (frequency response) | 100kHz (-3db) | | | | | | | | | | |
| Light source | semiconductor laser <0.39mW, 670nm (red, laser class 1) | | | | | | | | | | |
| Permissible ambient light | ≤ 5000lx ³⁾ | | | | | | | | | | |
| Analogue output | 0 ... 10VDC (adjustable gain) | | | | | | | | | | |
| Temperature drift of the analogue output | ≤130mV (at 10 - 50°C) | | | | | | | | | | |
| Switching output | PNP dark switching and NPN bright switching (max. switching frequency 60kHz) adjustable signal threshold | | | | | | | | | | |
| Shock | 15g / 6ms | | | | | | | | | | |
| Vibration | 15g / 10Hz...1kHz | | | | | | | | | | |
| Operation temperature | 0 ... 50°C | | | | | | | | | | |
| LED display | Switching state and dusty optics | | | | | | | | | | |
| Storage temperature | -20 ... 70°C | | | | | | | | | | |
| Operation voltage | 12-32VDC, reverse polarity protection | | | | | | | | | | |
| Mounting holes | straight up | | | | | | | | M4 x 5mm | | ø4.1mm |
| | horizontal | | | | | | | | M5 x 8mm | | M4 x 6mm |
| Weight (without cable) | light source | appr. 150g | | | | appr. 170g | | | | appr. 260g | |
| | receiver | appr. 120g | | | | appr. 160g | | | | appr. 220g | |
| Protection class | IP 67 | | | | | | | | | | |

FSO = Full Scale Output

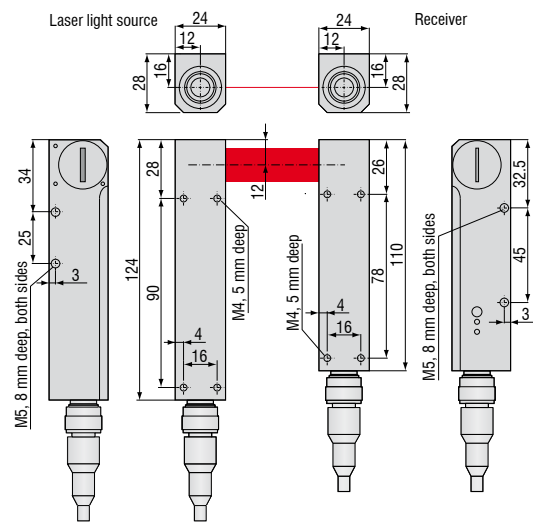
The quoted data apply for a constant room temperature of 20°C after a warm-up period of 30min, in the range 10 ... 90% of the analogue output at a distance between light source and receiver of 0.5m. Analogue offset <0.05V

¹⁾ Increasing the distance, the measurement of hot targets is possible without damaging the controller electronics
²⁾ For gap measurements 50 - 400µm there is a controller option available: thru-beam operation with distances up to 700mm
³⁾ Shadowing from ambient daylight increases the signal stability

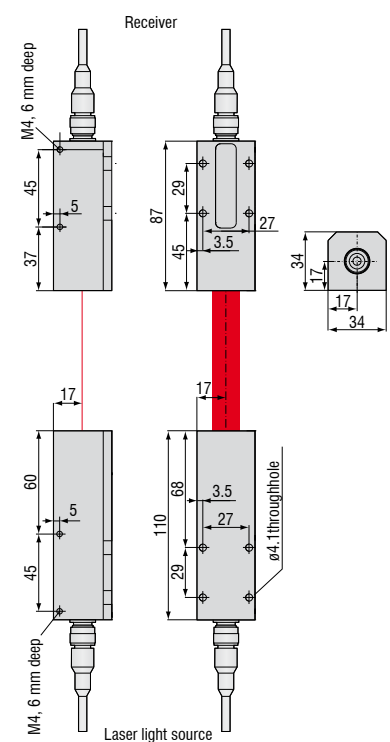
optoCONTROL 1200



optoCONTROL 1200/90



optoCONTROL 1201



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

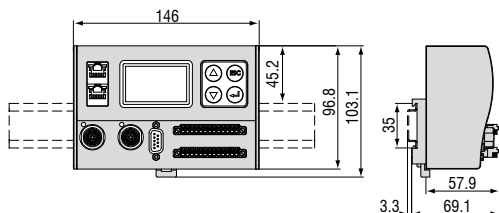


CSP2008 - Universal controller for up to six sensor signals

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)

Accessories optoCONTROL 1200/1201

| Art.-Nr. | 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 |

Accessories optoCONTROL 1202

| Art.-Nr. | Model | Description |
|----------|-----------------|---|
| 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 |

Accessories optoCONTROL 1220

| Art.-Nr. | Model | Description |
|----------|-----------------|---|
| 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 |
| 6414114 | EK1100/CSP2008 | Bus terminal |
| 6414107 | EL3162/CSP2008 | Bus terminal; 2-channel analogue input terminal |
| 2420057 | CSP2008 | Universal controller for displacement sensors |

Accessories optoCONTROL 2500/2600

| Art.-Nr. | Model | Description |
|----------|---------------------------|---|
| 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 |
| 2964022 | MBC300 | Assembly block for controller ODC2500/2600 |
| 2213024 | | IF2004/USB 4 channel RS422/USB converter |
| 2213022 | | Industrial converter for ILD-Sensors, RS-422/USB |
| 2901528 | IF2008-Y adaptation cable | Adaptation cable, Y-type, 100mm |
| 6414071 | | 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 | IF2004/USB 4fach RS422/USB Konverter |
| 2213022 | | Industrial converter for ILD-Sensors, RS-422/USB |
| 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 RS422 to CSP2008 |
| 6414114 | EK1100/CSP2008 | Bus terminal |

Zubehör Netzteile

| | | |
|---------|--------|--|
| 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