MICRO-EPSILON

More Precision

optoCONTROL // Optical precision micrometers

	Measuring range 28mm
	Resolution typ. 2μm
	Repeatability typ. ±4μm
Analogue	Analogue output 0 ... 10VDC
Serial	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)

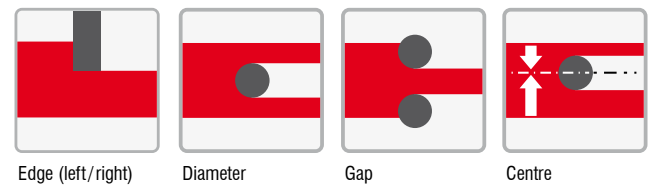Edge (left / right)   Diameter   Gap   Centre

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-todigital 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.
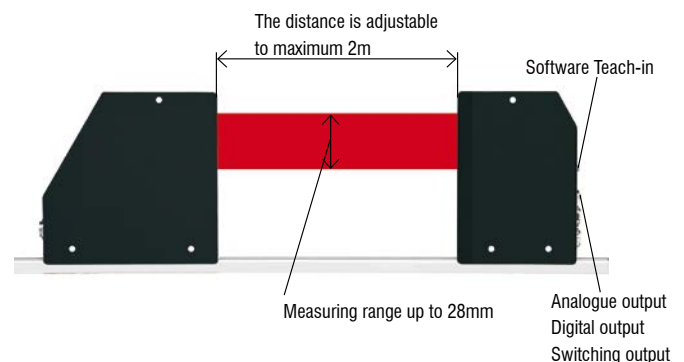

The distance is adjustable to maximum 2m

Software Teach-in

Measuring range up to 28mm

Analogue output
Digital output
Switching output

| Model	ODC1220-28
Laser	semiconductor laser, 670nm, DC-operation, ≤0.39mW max. opt. power, laser class 1 [1] the use of these laser sensors therefore requires no additional protective measures
Operating distance	distance light source - receiver up to 2000mm
Measuring range	typ. 28mm
Resolution	typ. 2μm
Repeatibility [2]	typ. ±4μm
Linearity	typ. ±0.08% [typ. ±22μm]
Measuring rate	max. 200Hz
Optical filter	interference filter, RG645; polarisation filter
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
Voltage supply	+24VDC (± 10%)
Sensitivity adjustment	using Windows® via PC
Laser adjustment	adjustable under Windows® via PC
Consumption	typ. 200mA
Protection class	electronics: IP54, optics: IP67
Operation temperature range	-10°C ... +50°C
Storage temperature range	-20°C ... +85°C
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) 4-pin female connector type binder series 712 (connection to the light source)
Connector light source	4-pin female connector type binder 712 (connection to receiver))
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
Max. switching current	100mA, short-circuit proof
Interface	RS232, programmable using ODC1202-Tool software (included)
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
Mounting rail	ODC1220-L220 (max. distance light source - receiver ≤ 220mm)
Output polarity	bright-/dark-switching, adjustable using Windows

[1] Laser class 1: IEC 60825-1: 2008-05
[2] Valid for ΔT≤5°C and ambient leight 5000lx. For stable measurement shadowing of the receiver is advisable. Smooth video AVG 64 values.

ODC1220-28-T (light source)   **ODC1220-28-R (receiver)**
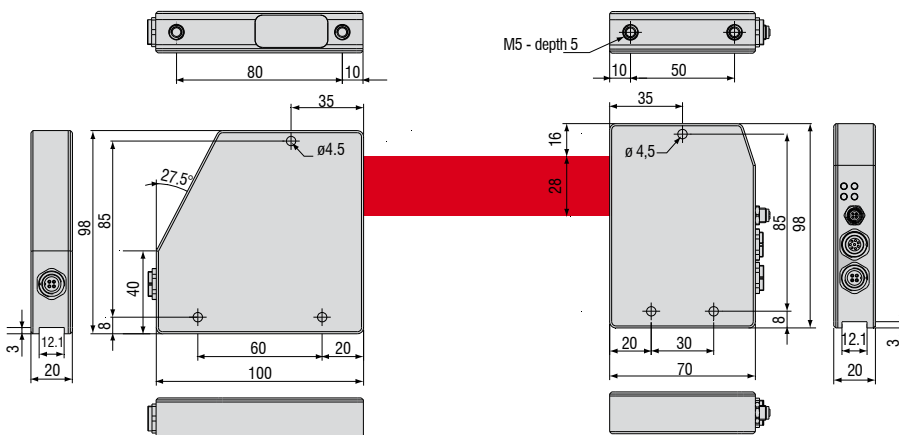
Mounting rail ODC1220-L220/L420/L620
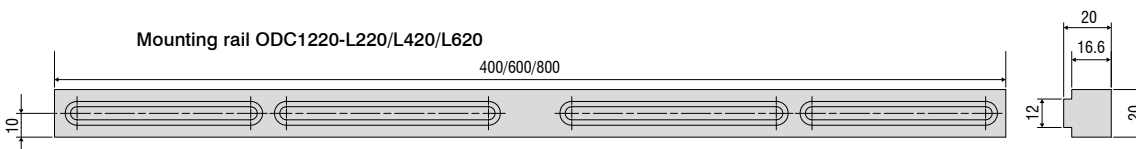
IF2008 - PCI interface card

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

IF2008

Example: measurement of diameters with two optoCONTROL. The diameter to be measured can be increased using two opto-CONTROL. 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 and8 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 Ether-CAT 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
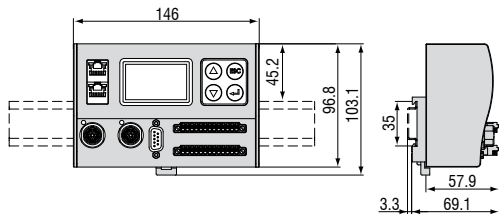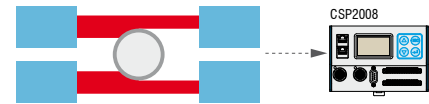
Universal controller with DIN rail TS 35
(dimensions not to scale)

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

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

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

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≤2mW, E≤0.2mW/cm²; λ=670nm

optoCONTROL 2520 use a semiconductor class 1M laser with a wavelength of 670nm. The maximum optical output power is <=2mW . 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 ≤0.39 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