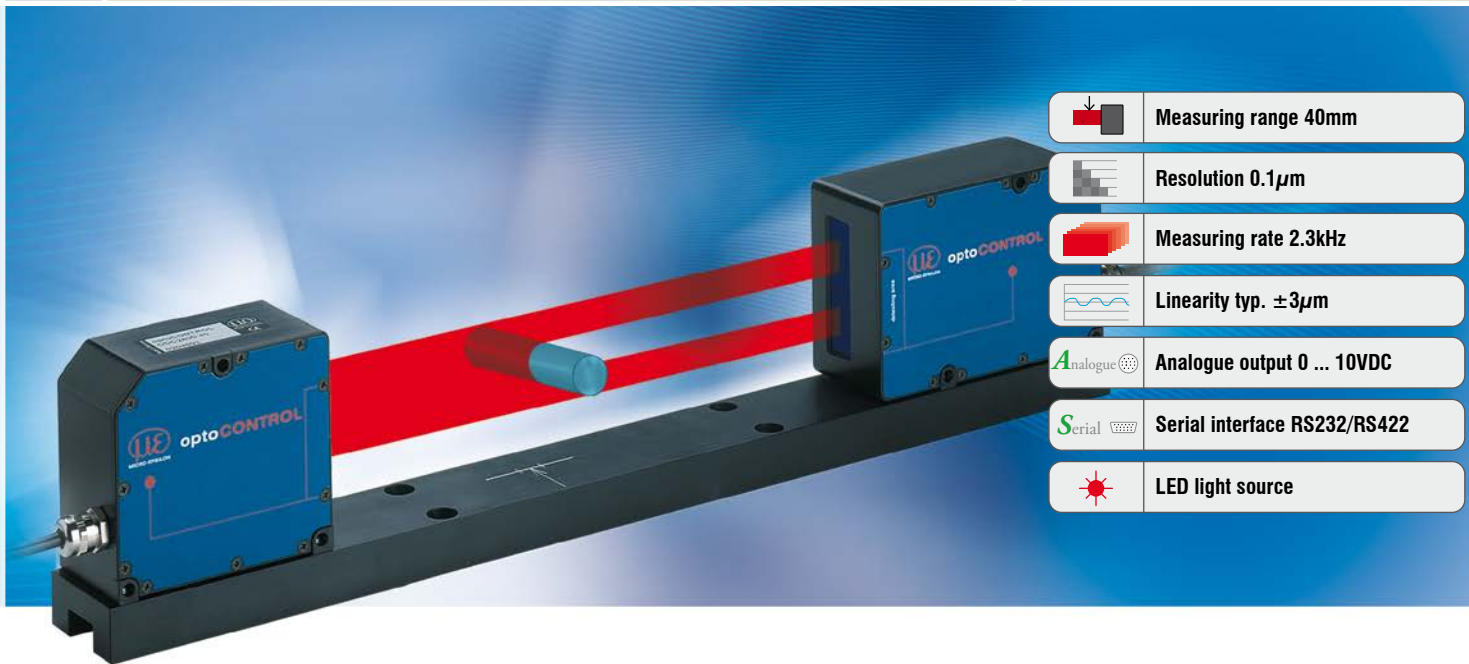




More Precision

optoCONTROL // Optical precision micrometers





- ▶ Maximum resolution and accuracy
- ▶ Outstanding repeatability
- ▶ Measuring rate 2.3kHz for fast processes
- ▶ Insensitive to external light
- ▶ Measurement against glass and transparent plastics
- ▶ Six different measuring programs
- ▶ Measures up to 4 segments simultaneously (e.g. 4 x diameter)
- ▶ Free parameterisation and data acquisition tool

Measuring principle

optoCONTROL 2600 is an optical measuring system with integrated high resolution CCD camera. Using a special lens arrangement, an LED light source produces a parallel light curtain (visible red light), which is imaged on the CCD camera via a telecentric lens. If an object to be measured is placed in the light curtain, the shadow it creates is detected by the CCD array. The measured data is output via analogue and digital interfaces. The system is insensitive to high external light conditions.

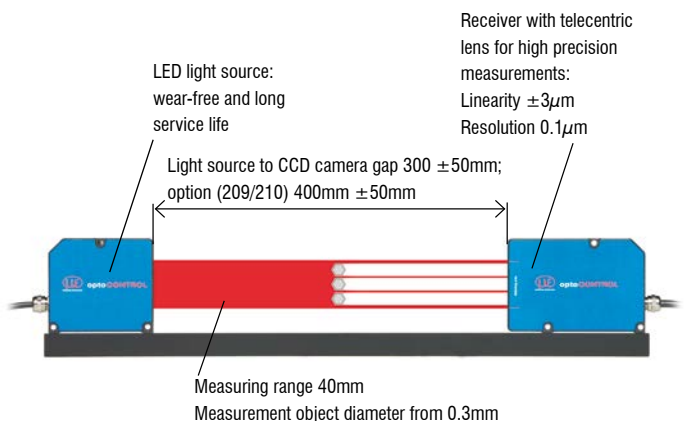
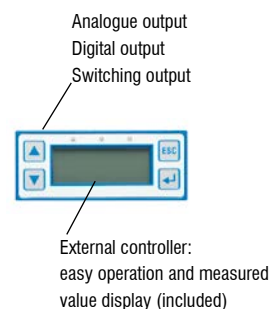
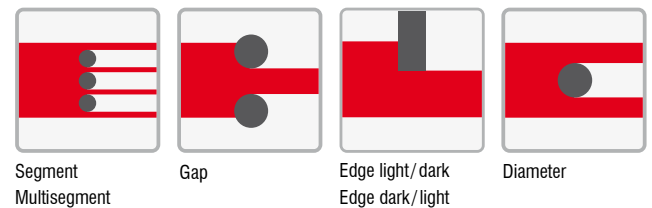
System design

optoCONTROL 2600 consists of a sensor unit and a controller, which are attached to a mounting rail. The sensor unit comprises a light source with high power LED and a receiver with telecentric lens and CCD array. The sensor unit is controlled and evaluated by an intelligent controller with graphical display for operation and display of the measured value.

The adjustable light source enables precise measurement of most transparent objects. Significantly higher accuracies and repeatability of measured data is made possible due to the combination of LED with telecentric lens arrangement. The system is insensitive to dirt and moisture.

Predefined measurement modes

(six individual programs can be generated)



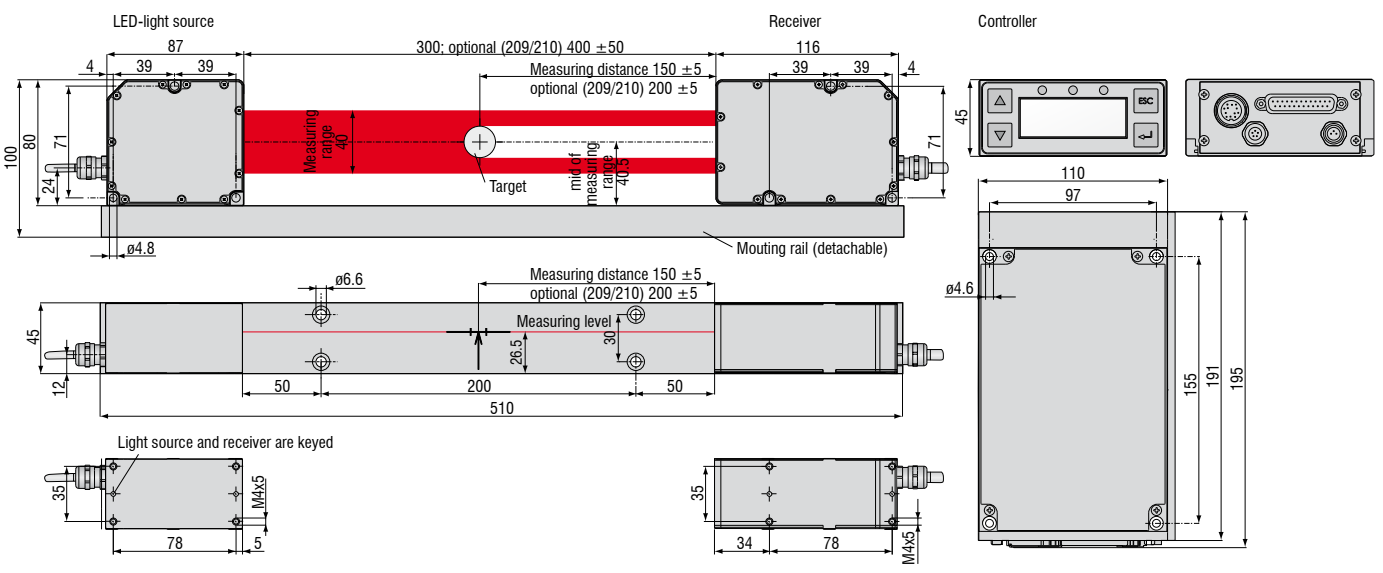
| Model | ODC2600-40 | ODC2600-40(209) | ODC2600-40(210) |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------|
| Measuring range | | 40mm | |
| Smallest diameter or gap (detectable target) | | 0.3mm | |
| Distance light source - CCD camera (free space) | 300 (±50)mm | 400 (±50)mm | 400 (±50)mm |
| Distance (target to receiver) | 150 (±5)mm | 200 (±5)mm | 200 (±5)mm |
| Linearity (3 s) ¹⁾ | | < ±3µm | |
| Resolution ²⁾ | | 0.1µm | |
| Repeatability ¹⁾³⁾ | ±1µm | ±1.5µm | ±1.5µm |
| Measuring rate | | 2.3kHz | |
| Light source | | red LED | |
| Analogue output (voltage) | | 0 ... 10VDC, range ±10VDC, selectable | |
| Digital output | | RS232 (115.2kBaud) or RS422 (691.2kBaud) | |
| Switching output | | error, 4x limit, synchronisation | |
| Input | | zero; reset; trigger; synchronisation; light on/off (programmable) | |
| Shock | | acc. IEC 60068-2-29 | |
| Vibration | | acc. IEC 60068-2-6 | |
| Operation temperature | | 0 to 50°C | |
| Storage temperature | | -20 to 70°C | |
| Power supply | | 24VDC (±15%), <1A | |
| Cable length (controller-light source/controller-CCD camera) | | standard: 2m | standard: 2m, cable outlet light source and receiver 90° |
| Protection class | receiver / light source | IP 64 | |
| | controller | IP 40 | |
| Measurement programs | edge light-dark; edge dark-light; diameter; gap; segment; multi-segments; 4 user-programs | | |
| Display | LC-display (value, maximum, minimum, peak-to-peak); display in mm or inch, selectable; menu languages in German / English, selectable; 3x LED (power on, light on, error) | | |

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

¹⁾ (edge measurement, no averaging at the target, operating distance 150 ±5mm) < ±3µm
²⁾ Display resolution (resolution digital output 0.6µm)
³⁾ Measured at static noise for 3 min.

Optional versions

- Carry case version for service tasks
- Customised cable lengths, modified cable outlet
- Customer-specific software (measuring programs, statistics)
- System for measurement of grooved surfaces
- System with reduced distance between transmitter and receiver
- System with reduced and increased distance between transmitter and receiver



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.

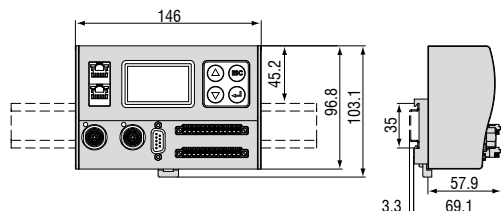


CSP2008 - Universal controller for up to six sensor signals

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