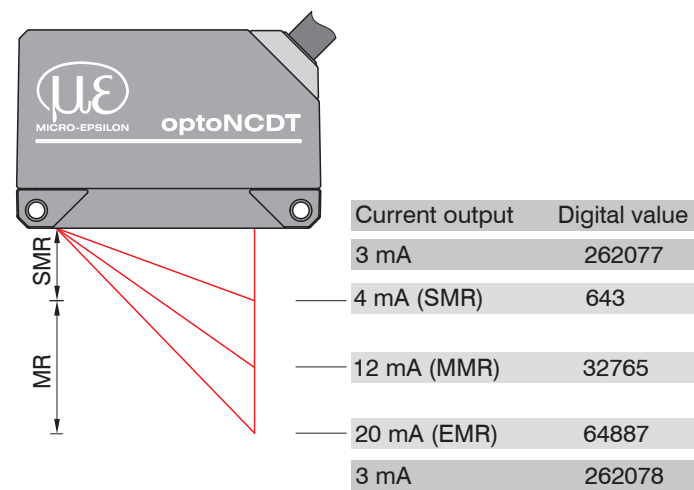
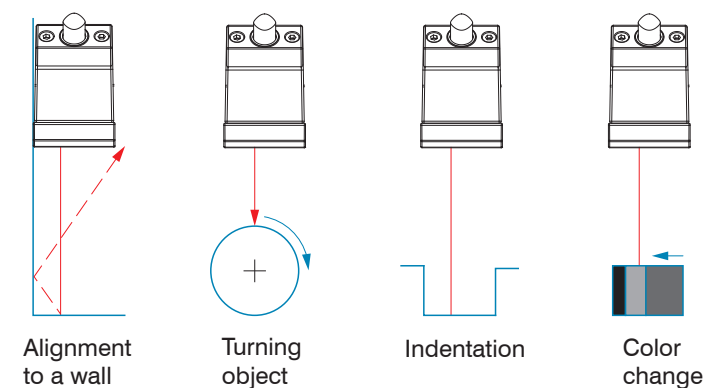




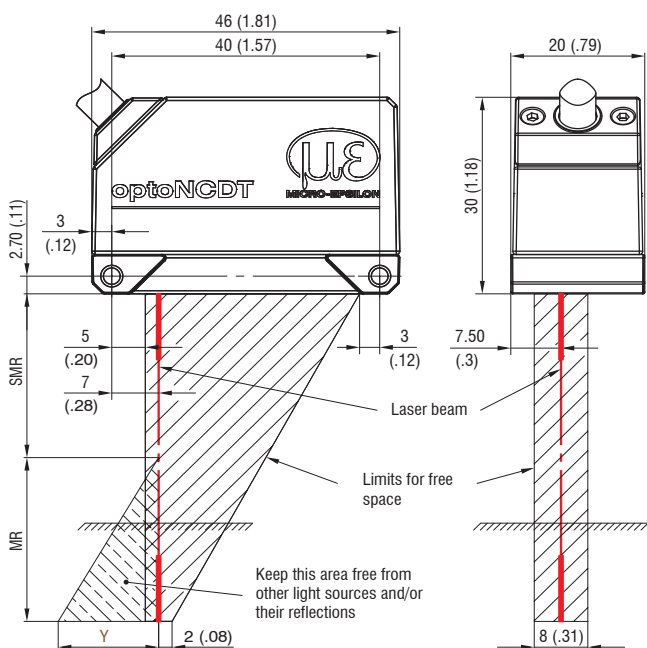
## Measuring Range, Start of Measuring Range



## Sensor Arrangement with Bore Holes and Edges

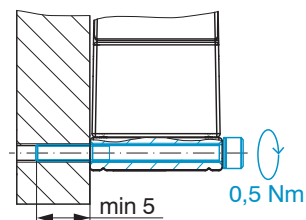


## Drawings



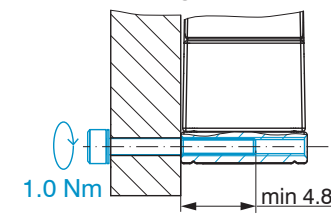
## Mounting

### Bolt connection



Washer A2,2; ISO 7089 - A2  
M2 x 25; ISO 4762-A2

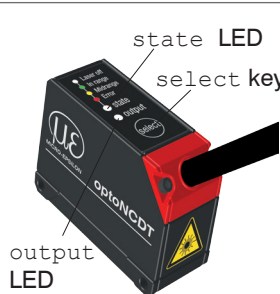
### Direct fastening



Washer A3,2; ISO 7089 - A2  
M3; ISO 4762-A2

## Control and Indicator Elements

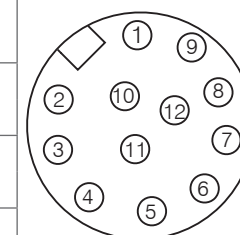
State LED	Color	Output LED
Measuring object within measuring range	Green	RS422 output
Measuring object in mid of measuring range	Yellow	Output off
Error - e.g. object outside of measuring range, insufficient reflection	Red	Current output 4 ... 20 mA
Laser off	Off	Sensor off, no supply



By factory default the **select** key is assigned with the functions **Reset** and **Teach**.  
- assigned with the functions **Reset** and **Teach**.  
- only active for the first 5 minutes after power up. After that it will be automatically locked.  
The function **Mastering** can be assigned to the key via the web interface.

## Pin Assignment

Signal	Pin	Color sensor cable <sup>1</sup>	Description	Specification, Wiring
RS422 Rx+	3	Green	Serial input	Internally terminated with 120 Ohm
RS422 Rx-	4	Yellow	Serial input	Internally terminated with 120 Ohm
RS422 Tx+	5	Gray	Serial output	Terminate with 120 Ohm at the receiver
RS422 Tx-	6	Pink	Serial output	Terminate with 120 Ohm at the receiver
V <sub>+</sub>	7	Red	Supply voltage	11.2 ... 30 VDC, typ. 24 VDC, P < 2 W
Laser on/off	8	Black	Switching input	Laser is active, if input is connected with GND
Multifunction input	9	Violet	Multifunction input (TrigIn, Zero/Master, TeachIn)	Multifunction input (TrigIn, Zero/Master, TeachIn)
Error	10	Brown	Switching output	I <sub>max</sub> = 100 mA, V <sub>max</sub> = 30 VDC, Programmable switching behavior: (NPN, PNP, Push-Pull, Push-Pull negated)
I <sub>OUT</sub>	11	White	4 ... 20 mA	R <sub>Load</sub> = 250 Ohm: V <sub>OUT</sub> 1 ... 5 V with V <sub>+</sub> > 11.2 V R <sub>Load</sub> = 500 Ohm: V <sub>OUT</sub> 2 ... 10 V with V <sub>+</sub> > 17 V
GND	12	Blue	Reference ground	Supply and signal ground
Connector housing	Shield	Shield	Sensor housing	Connect with potential equalization



Solder pin side female cable connector

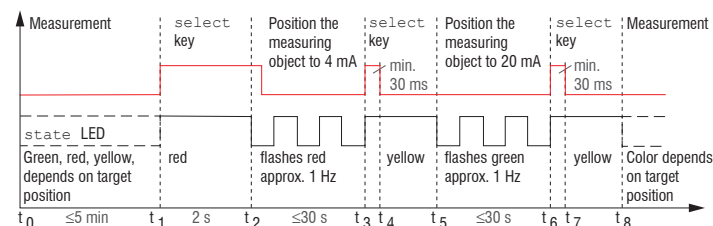
The shield of the cable is connected with the housing of the sensor. The sensor cable is not drag-chain suitable. One end is molded on the sensor, the other end has free leads with ferrules or a pigtail with an M12 male connector.

<sup>1)</sup> Integrated sensor cable, PCF1420-x/I and PCF1420-x/U

## Output Scaling

Teaching scales the analog output. This allows you to optimize the resolution for the analog output. The behavior of the current and switching output changes. In every case, 2 points are taught which characterize the start and the end of the new measuring range. The teaching is performed via the built-in **select** key, the multi-function input or via web interface.

## Timing:



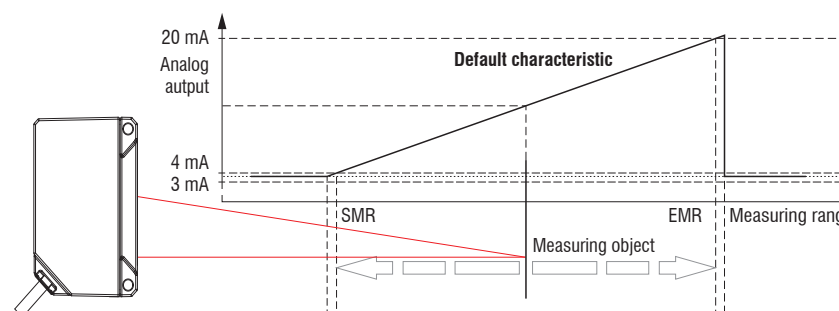
Type	10	25	50	100	200	500	10LL	25LL	50LL
MR	10	25	50	100	200	500	10	25	50
SMR	20	25	35	50	60	100	20	25	35
EMR	30	50	85	150	260	600	30	50	85
Y	10	21	28	46	70	190	10	21	28

Dimensions in mm (inches)

MR = Measuring range  
SMR = Start of measuring range  
MMR = Mid of measuring range  
EMR = End of measuring range  
FSO = Full scale output

## Factory Setting

- Current output
- Measurement averaging: Median 9
- Measuring rate: 2 kHz
- Interface: 921.6 kBps
- Measuring range:
  - 100 % FSO: I = 20 mA, digital 64887
  - 0 % FSO: I = 4 mA, digital 643



## Notes on CE and UKCA Marking

EU directive 2014/30/EU / SI 2016 No. 1091

The sensor fulfills the specification of the EMC requirements, if the instructions in the operating manual are followed.

## Proper Environment

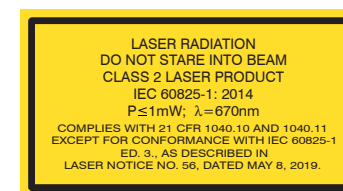
- Protection class<sup>1)</sup>: IP67
- Operation: 0 ... +50 °C (+32 ... +104 °F)
- Storage: -20 ... +70 °C (-4 ... +158 °F)
- Humidity: 5 - 95 % (non-condensing)
- Pressure: Atmospheric pressure

<sup>1)</sup> Models with option 002 + 004 have protection class IP40

## Laser Safety

The optoNCDT1420 operates with a semiconductor laser with a wavelength of 670 nm (visible/red). The sensors fall within laser class 2. The laser is operated on a pulsed mode, the maximum optical power is ≤ 1 mW. The pulse frequency depends on the adjusted measuring rate (0.25 ... 8 kHz). The pulse duration of the peaks is regulated depending on the measuring rate and reflectivity of the target and can be 0.125 up to 3999.6 μs.

Operation of the laser is indicated visually by the **state** LED on the sensor.



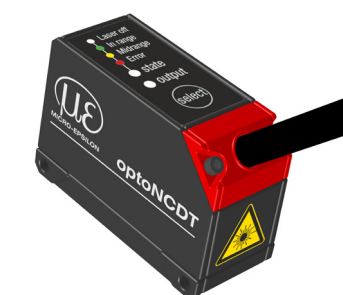
Laser label on the sensor cable



Laser warning sign on the sensor housing

Read the detailed operating instructions before using the sensor.

The manual is available online on



Assembly Instructions  
optoNCDT 1420  
optoNCDT 1420LL  
optoNCDT 1420 Option 002 + 004

## Warnings

Avoid unnecessary laser radiation to be exposed to the human body. Switch off the sensor for cleaning and maintenance. Switch off the sensor for system maintenance and repair if the sensor is integrated into a system.

Caution - use of controls or adjustments or performance of procedures other than those specified may cause harm.

Connect the power supply and the display/output device according to the safety regulations for electrical equipment. The supply voltage must not exceed the specified limits.

> Risk of injury, damage to or destruction of the sensor

Avoid shocks and impacts to the sensor. Avoid constant exposure of sensor to splashes of water. Avoid exposure of sensor to aggressive media (detergents, cooling emulsions).

> Damage to or destruction of the sensor

Mount the sensor only to the existing mounting holes/thread holes on a flat surface. (Clamps of any kind are not permitted).

Attach the cable in such a way that it is free of load. Fix the cable after appr. 25 cm and fix the pigtail on the connector e.g. cable tie.