

Proper Environment

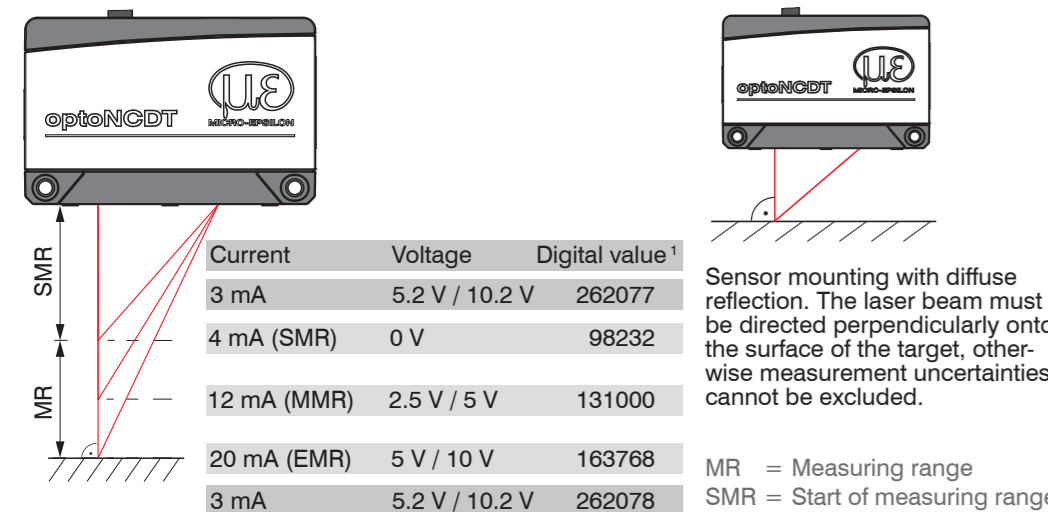
- Protection class: IP67 (applies only when the sensor cable is plugged in)
- Optical inputs are excluded from protection class. Contamination leads to impairment or failure of the function.
- Temperature range
 - Operation: 0 ... +50 °C (+32 ... +122 °F)
 - Storage: -20 ... +70 °C (-4 ... +158 °F)
- Humidity: 5 - 95 % (non-condensing)
- Ambient pressure: Atmospheric pressure

Sensor Mounting, Dimensions

The optoNCDT 1900 sensor is an optical system for measurements with micrometer accuracy. Pay attention to careful handling during mounting and operation.

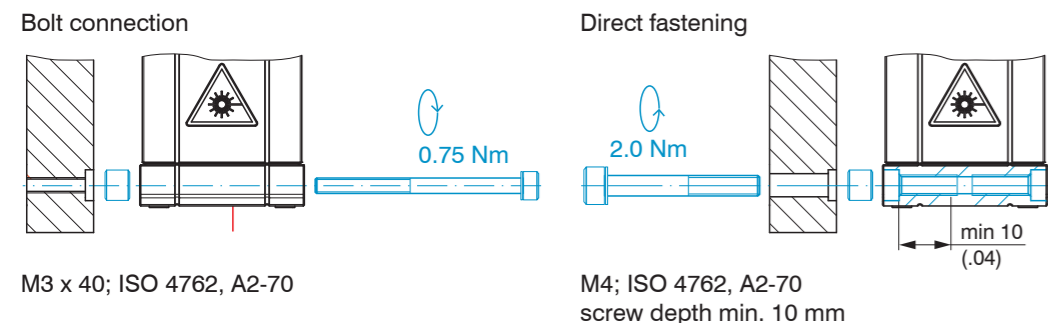
- ➔ Mount the sensor only to the existing holes on a flat surface. Clamps of any kind are not permitted.
- ➔ Mount the sensor by means of 2 screws type M4 or by means of through bores for M3 with the screws from the accessories.

Measuring range, Start of Measuring range



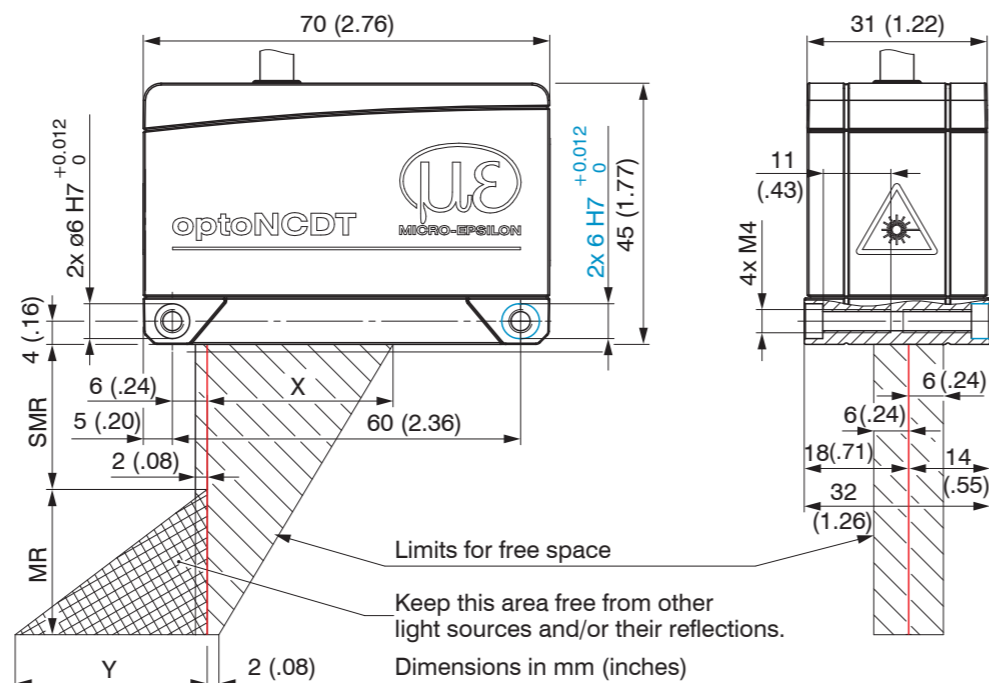
1) For displacement values without zero setting or mastering.

Mounting

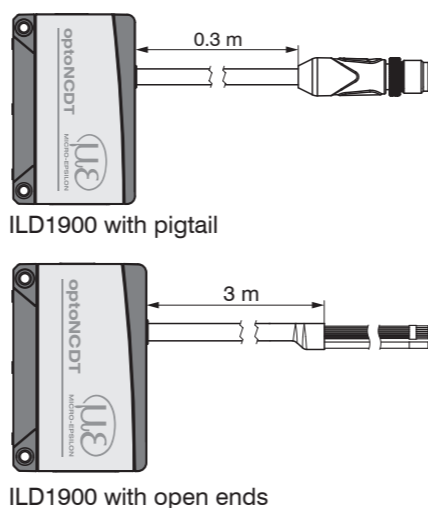
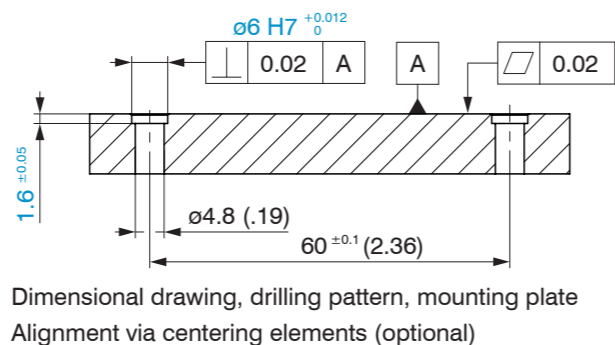


Drawings, Free Space

- ➔ Mount the sensor only to the existing holes on a flat surface or screw it directly. Do not exceed torques.

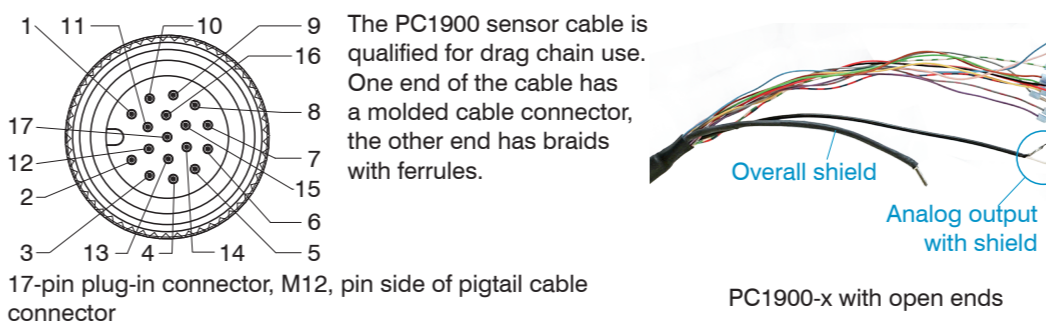


MR	10	25	50
SMR	20	25	40
X	33	33	36
Y	14	33	45

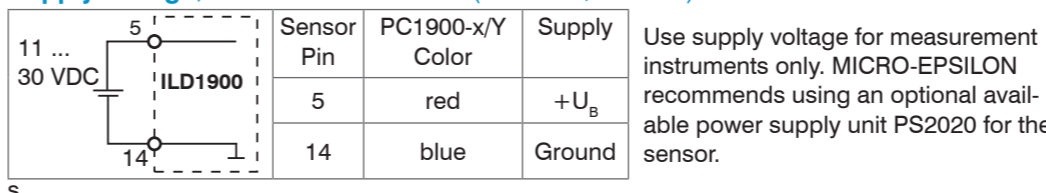


Pin Assignment

Signal	Pin	Cable Color PC1900-x	Description
+U _B	5	Red	Supply voltage (11 ... 30 VDC)
GND	14	Blue	System ground supply, switch signals (Laser on/off, Zero, Limits) Current 4 ... 20 mA ($R_B < (U_B - 6 V) / 20 \text{ mA}$)
Analog output	1	Coaxial inner conductor, white	Voltage 0 ... 5 VDC Voltage 0 ... 10 VDC ($R_i = 50 \text{ Ohm}$, $I_{\text{max}} = 5 \text{ mA}$)
AGND	2	Screening, black	Reference potential for analog output
Laser on/off	3	Black	Switching input, Laser operates when pin 3 is connected to GND
Multifunction input	13	Violet	Switching input, TrigIn, Zero/Master, TeachIn, Slaveln
Error/Limit 1	10	Brown	Switching output 1
Limit 2	11	White	Switching output 2 Programmable switching behavior: (NPN, PNP, push-pull)
Sync +	17	Gray-pink	Symmetrical synchronous output (Master) or input (Slave). RS422 level, 120 Ohm switchable for terminating, selectable input or output depending on synchronization mode
Sync -	12	Red-blue	
Tx +	8	Gray	RS422 - Output (symmetric) terminate receiver with 120 Ohm
Tx -	15	Pink	
Rx +	9	Green	RS422 - Input (symmetric) internally terminated with 120 Ohm
Rx -	16	Yellow	



Supply voltage, Nominal value: 24 V DC (11 ... 30 V, P < 3 W)



Intended Use

The optoNCDT 1900 system is designed for use in industrial and laboratory areas. It is used for measuring displacement, distance and position as well as in in-process quality control and dimensional testing. The sensor must only be operated within the limits specified in the technical data, see operating instructions, Chap. 3.3. The sensor must be used in such a way that no persons are endangered or machines and other material goods are damaged in the event of malfunction or total failure of the sensor. Take additional precautions for safety and damage prevention for safety-related applications.

Warnings

Avoid unnecessary laser radiation to be exposed to the human body. Switch off the sensor for cleaning and maintenance, 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 constant exposure of sensor and controller. Avoid exposure of sensor and controller to aggressive media (detergents, cooling emulsions).
> Damage to or destruction of the sensor.

Avoid shocks and impacts to the sensor. Protect the sensor cable against damage.
> Damage to or destruction of the sensor, failure of the measuring device.

Laser Safety

The ILD1900 sensors operate 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. Operation of the laser is indicated visually by LED state.



Laser warning sign on the sensor housing



Laser label on the sensor cable

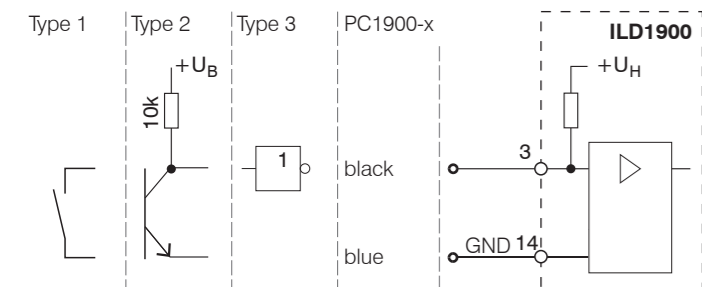


Laser radiation. Close your eyes or immediately turn away if the laser beam hits the eye. Irritation or injury of the eyes possible.



Assembly Instructions optoNCDT 1900

Switch on the Laser

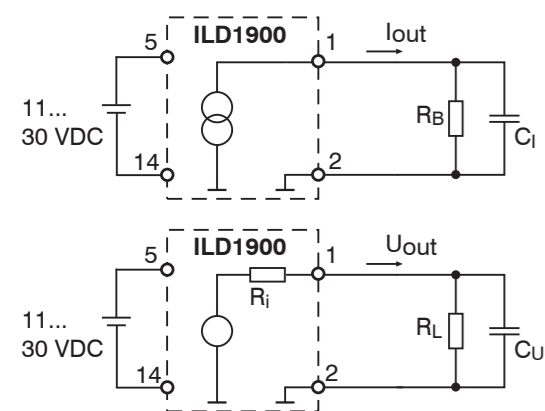


The laser remains off as long as pin 3 is not electrically connected with pin 14.

Analog Output

Current output 4 ... 20 mA or
Voltage output 0 ... 5 V or 0 ... 10 V

The current output may not be continuously operated in short-circuit operation without load resistor. This would lead to thermal overload and thus to the automatic overload cut-off of the output.



Current output
 $R_B < (U_B - 6 \text{ V}) / 20 \text{ mA}$;
 $R_B \text{ max.} = 250 \text{ Ohm}$
at $U_B = 11 \text{ V}$
 $C_1 \leq 33 \text{ nF}$

Analog output
Pin 1,
coaxial inner conductor, white

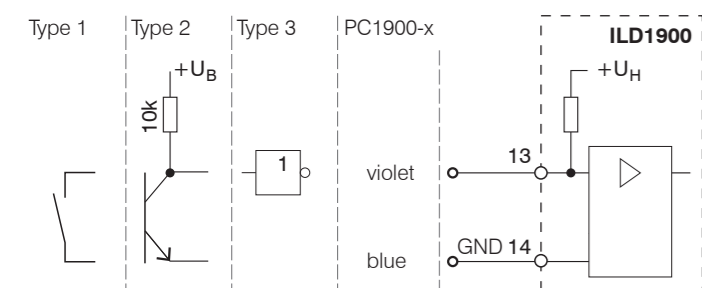
AGND Pin 2,
screening

Voltage output
 $R_i = 50 \text{ Ohm}$, $I_{\text{max}} = 5 \text{ mA}$,
Short circuit protection 7 mA
 $R_L > 20 \text{ MOhm}$
 $C_U \leq 100 \text{ nF}$

Multi-Function Input

The multi-function input enables triggering, zero setting/mastering and teaching. The function depends on the programming of the input and on the timing of the input signal.

The inputs are not electrically isolated. The maximum switching frequency is 10 kHz.



24 V logic (HTL):
Low $\leq 3 \text{ V}$; High $\geq 8 \text{ V}$
(max 30 V)
5 V logic (TTL):
Low $\leq 0.8 \text{ V}$; High $\geq 2 \text{ V}$
internal pull-up resistor, an
open input is detected as High.

➔ Connect the input to GND to trigger the function.

RS422 Connection with USB Converter IF2001/USB

Cross the lines for connections between sensor and PC.

Disconnect or connect the D-sub connection between RS422 and USB converter when the sensor is disconnected from power supply only.

Sensor		End device (converter) Type IF2001/USB from MICRO-EPSILON
17-pin cable connector	Sensor cable	
Tx + (Pin 8)	Gray	Rx + (Pin 3)
Tx -(Pin 15)	Pink	Rx -(Pin 4)
Rx + (Pin 9)	Green	Tx + (Pin 1)
Rx -(Pin 16)	Yellow	Tx -(Pin 2)
GND (Pin 14)	Black	GND (Pin 9)

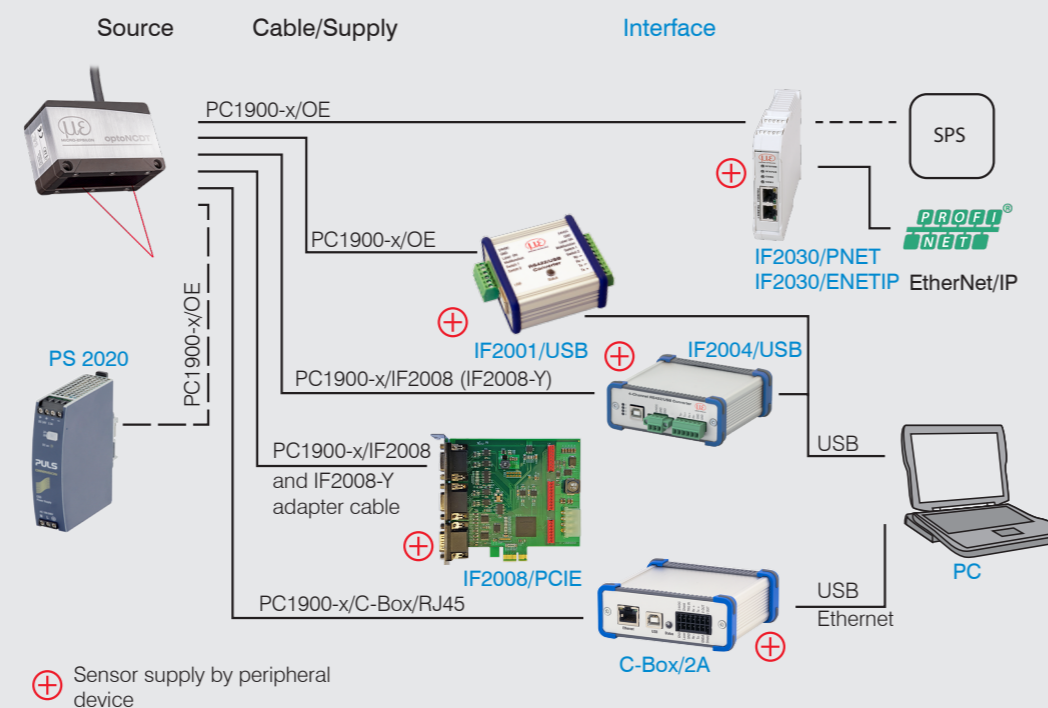


Symmetric differential signals acc. to EIA-422, not electrically isolated from supply voltage. Use a shielded cable with twisted cores e.g. PC1900-x.

Quick Guide

Components

➔ Mount the sensor and connect the components.

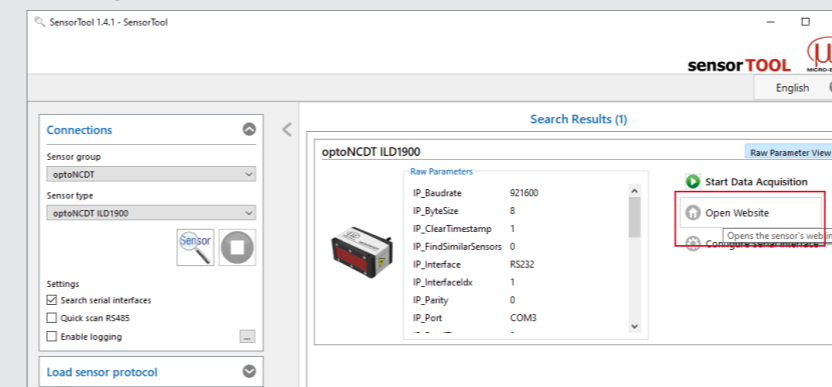


⊕ Sensor supply by peripheral device

Initial Operation

- ➔ Connect the sensor to a PC/notebook via a RS422 connector. Connect the supply voltage.
- ➔ Start the program `sensorTOOL`.
- ➔ Click the `Sensor` button.

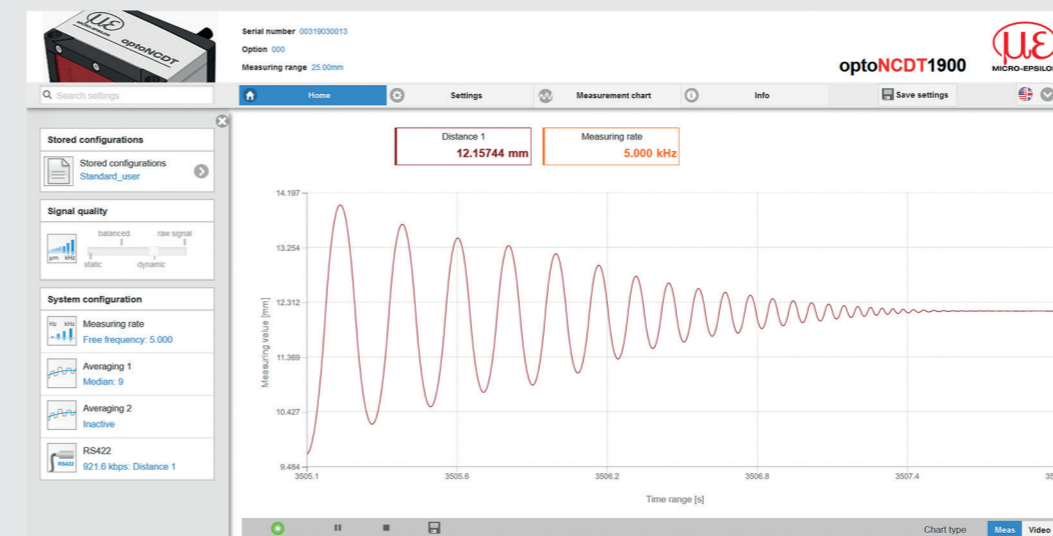
The program searches for connected ILD1900 sensors on available interfaces.



➔ Select the desired sensor. Click on the button `Open Website`.

Access via Web Interface

Interactive web pages for programming the sensor now appear in the web browser. The sensor is active and supplies measurement values. The ongoing measurement can be operated by means of function buttons in the area `Measurement chart`.



In the top navigation bar other functions (settings, measurement chart etc.) are available.

The appearance of the websites can change dependent on the functions. Each page contains descriptions of parameters and tips for filling the website.

Select a Measuring Rate

➔ Go to the menu `Settings > Data recording > Measuring rate`.

Start with a medium measuring rate. Select a measuring rate from the list. Confirm with `Apply`.

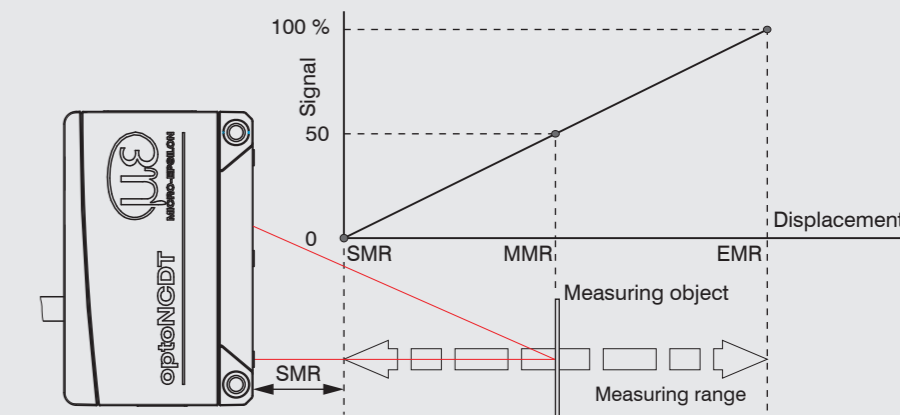
Select an Interface

➔ Go to the menu `Settings > Outputs > Output interface`.

Defines which interface is used for output of measured values. Parallel output of measured values via multiple channels is not possible. RS422 and analog output cannot be operated simultaneously. While using the web interface, the output is switched off via RS422.

Place Target

➔ Position the target (measuring object) as much as possible in the midrange.



The State LED on the sensor indicates the position of the target to the sensor.

LED	Color	Labeling	Meaning
	off	Laser off	Laser beam is switched off
State	green	In range	Target within measuring range
	yellow	Midrange	Target within the midrange
	red	Error	Target outside the measuring range, too low reflection

Store the Settings

➔ Go to the menu `Settings > System settings > Load & Stores` or click the `Save settings` button.

Read the detailed operating instructions before using the sensor. The manual is available online on www.micro-epsilon.de/download/manuals/man--optoNCDT-1900--en.pdf.