**Sensor Mounting**

The optoNCDT 1900 sensor is an optical system for measurements with micrometer accuracy. Ensure careful handling during installation and operation!

Mount the sensor only to the existing through-bores (mounting holes) on a flat surface. Any type of clamping is not permitted.

Mount the sensor using two M4 screws or via the through-bore for M3 using the screws from the accessories.

**Measuring Range, Start of Measuring Range**

Mounting with diffuse reflection. If the laser beam does not strike the object surface at a perpendicular angle, measurements might be inaccurate.

**Power supply**

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

**Industrial Ethernet with PoE**

Sensor supply is via a PoE-capable switch. Phantom powering (PoE) is possible via the
- PC1900-IE-x/RJ45
- PC1900-IE-x/OE-RJ45 cables.

**Industrial Ethernet without PoE**

Sensor supply is via the PC1900-IE-x/OE-RJ45 cable.

As an alternative to PoE, the sensor can be supplied with the optional PS2020 power supply unit. Voltage supply only for measuring devices, not to be used for drivers or similar sources of impulse interference at the same time. MICRO- EPSILON recommends using an optional available power supply unit PS2020 for the sensor.

- Only turn on the power supply after wiring has been completed.
- Connect the inputs Pin 1 and Pin 2 at the sensor with a 24V power supply.

**Laser Safety**

The optoNCDT 1900 operates with a semiconductor laser with a wavelength of 670 nm (visible/red) or 658 nm (visible/red). Operation of the laser is indicated visually by the LED state on the sensor. When operating the optoNCDT 1900 sensors, the relevant regulations according to IEC 60825, Part 1 of 05/2014 and the applicable accident prevention regulations must be followed.

If both warning labels are covered over when the unit is installed, the user must ensure that supplementary labels are applied.

**Laser Class 2**

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 ... 10 kHz).

The pulse duration of the peaks is regulated depending on the measuring rate and reflectivity of the target and can be 4 up to 3995 μs.

**Laser Class 3R**

The sensors fall within laser class 3R. The laser is operated on a pulsed mode, the maximum optical power is ≤ 5 mW. The pulse frequency depends on the adjusted measuring rate (0.25 ... 10 kHz).

The pulse duration of the peaks is regulated depending on the measuring rate and reflectivity of the target and can be 4 up to 3995 μs.

**WARNING**

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

- Laser warning sign on the sensor housing
- Laser labels on the sensor cable

**Electrical Connections**

**RJ45 Connection, PoE, Laser On/Off via Software**

- PC1900-IE-x/RJ45
- Ethernet/IP
- EtherCAT
- EtherCAT
- PoE Switch
- PLC

**RJ45 Connection, PoE, Laser On/Off via Hardware**

- PC1900-IE-x/RJ45
- Ethernet/IP
- EtherCAT
- EtherCAT
- PoE Switch
- PLC

**RJ45 Connection, Supply via Optional Power Supply Unit, Laser On/Off via Hardware**

- PC1900-IE-x/RJ45
- Ethernet/IP
- EtherCAT
- EtherCAT
- PoE Switch
- PLC

**Intended Use**

The optoNCDT 1900 is designed for use in industrial and laboratory applications. It is used for measuring displacement, distance and position as well as in 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 in case of safety-related applications.

**Warnings**

Avoid unnecessary laser radiation to be exposed to the human body.

- Switch off the sensor for clearing 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 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 the sensor to splashes of water. Avoid exposure of sensor to aggressive media (detergents, cooling emulsions).

> Damage to or destruction of the sensor.

Avoid shock and vibration to the sensor. Protect the sensor cable against damage.

> Damage to or destruction of the sensor, failure of the measuring device.
Control and Display Elements

<table>
<thead>
<tr>
<th>State LED</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Measuring object within the measuring range</td>
</tr>
<tr>
<td>Yellow</td>
<td>Measuring object in the mid of measuring range</td>
</tr>
<tr>
<td>Red</td>
<td>No distance value available, e.g. target outside the measuring range, too low reflection</td>
</tr>
<tr>
<td>Yellow flashing, 1 Hz</td>
<td>Bootloader</td>
</tr>
<tr>
<td>Yellow flashing, 8 Hz</td>
<td>Installation active</td>
</tr>
</tbody>
</table>

State LED lights up (green, yellow or red) and briefly flashes yellow at intervals of approx. 1 sec.

Off
Laser switched off

LED RUN/SF/MS
Meaning
- depending on Industrial Ethernet operation (IE)

LED ERR/IF/NS
Meaning
- depending on Industrial Ethernet operation (IE)

Select button
Meaning
- Switching operating mode (with EtherCAT only)
- Resetting to factory setting

Quick Guide

Structure of the Components
- Mount the sensor and connect the components to one another.

Initial Operation
- Connect the sensor to a power supply and PoE is not used.

Operation via Web Interface
The sensors start with the last stored operating mode. Standard is Industrial Ethernet (IE). A web server is implemented in the sensor; the web interface displays, among other things, the current settings of the sensor. Operation is only possible while there is an Ethernet connection to the sensor.

<table>
<thead>
<tr>
<th>Ethernet setup mode</th>
<th>Ethernet over EtherCAT (EoE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EtherCAT</td>
<td>EtherNet/IP</td>
</tr>
<tr>
<td>An ILD1900-IE with EtherNet/IP is delivered in DHCP mode without IP address. A DHCP server is required, to assign an temporary IP address to the sensor. Subsequently, it is also possible to assign a static IP address.</td>
<td></td>
</tr>
<tr>
<td>Assign an IP address to the sensor. You can find the example of this in the appendix of the operating instructions.</td>
<td></td>
</tr>
</tbody>
</table>

Access via Web Interface
- Start your web browser.
- Type the IP address of the sensor into the address bar.
- Interactive web pages you can use to configure the sensor are now displayed in the web browser. The web interface does not guarantee real-time measurements. The currently running measurement can be controlled using the function buttons in the Chart type section.

In the top navigation bar, other functions (settings, measurement chart etc.) are available. The appearance of the websites can change dependant of the functions. Each page contains dynamic parameter descriptions and tips on completing the web page.

After parameterization, store all settings permanently in a parameter set so that they are available again the next time the sensor is switched on. To do this, use the Save settings button.

Positioning the Target
- Position the target as centrally as possible within the measuring range.

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

LED | Color | Meaning
--- | ---- | ---
Off | - Laser beam is switched off.
Green | - Measuring object within the measuring range.
Yellow | - Target is in the mid of measuring range.
Red | - No distance value available, e.g. target outside the measuring range, too low reflection.

Proper Environment
- Protection class: IP67 (applies only when sensor cable is plugged in)
- Lenses are excluded from the protection class. Contamination of the lenses causes impairment or failure of the function.
- Temperature range: 0 ... +50 °C
- Operation: 0 ... +50 °C
- Humidity: 5 ... 95% (non-condensing)
- Storage: -20 ... +70 °C
- Ambient pressure: Atmospheric pressure

Proper Environment
- Temperature range: 0 ... +50 °C
- Operation: 0 ... +50 °C
- Humidity: 5 ... 95% (non-condensing)
- Storage: -20 ... +70 °C
- Ambient pressure: Atmospheric pressure

You can find more information about the sensor in the operating instructions. They are available online at: https://www.micro-epsilon.com/displacement-position-sensors/laser-sensor/optoNCDT_1900/?Lang=en