MICRO-EPSILON

# More Precision

## optoNCDT ILR // Laser-optical distance sensors

# High speed sensor for outdoor applications
# optoNCDT ILR1171-125

- Measuring range up to 125 m, (with reflector 270 m)
- Distance and speed measurements
- Laser class 1
- IP67 Robust design IP67
- Very high measuring rate for fast applications
- Optionally with integrated heating for outdoor applications

The optoNCDT ILR1171 is a laser-based distance sensor for non-contact and precise distance and displacement measurements from 0.2 m up to 125 m. The measuring range can be extended to 270 m with a reflector film. The sensor is designed for very large measuring ranges, with and without reflector. Due to the very high measuring rate of the sensor, moving objects can be measured easily. Even in poor visibility conditions, the ILR1171-125 impresses with its high signal intensity for stable measurements.

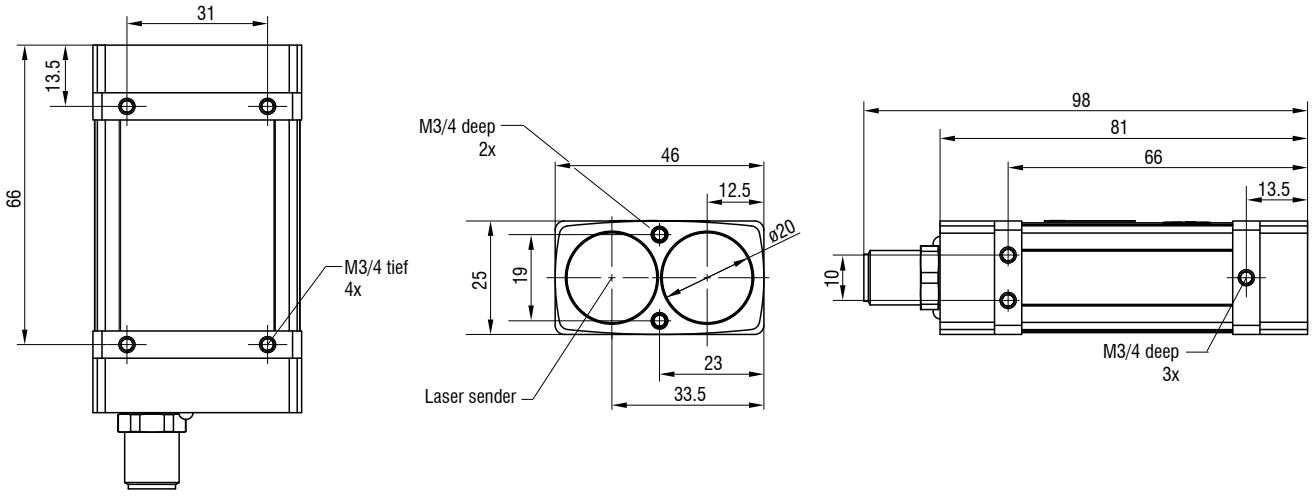
**Time-of-flight principle**

The sensor operates according to the laser pulse runtime principle and is therefore particularly well suited to applications with large distances. Commissioning of the sensor is straightforward due to a variety of interfaces and easy installation options. The actual measuring range depends on the reflectivity and the surface quality of the object to be measured.

**Versatile fields of application**

The optoNCDT ILR1171-125 is fitted with an integrated heater for outdoor use. A pilot laser is also integrated for mounting and adjustment. This makes it easier to align the sensor over long distances, for example when monitoring buildings. The RS422 and RS485 interfaces ensure reliable and fast data transmission.

**Dimensions:**

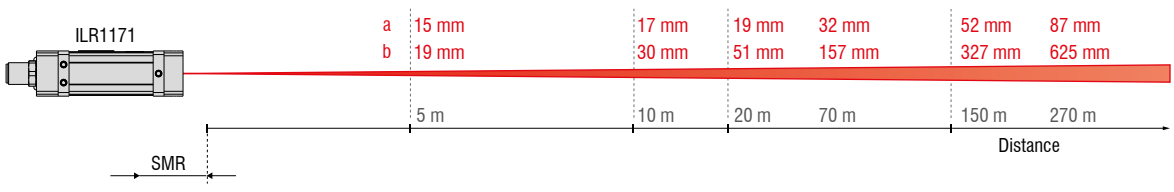



(dimensions in mm, not to scale)

| Model | | ILR1171-125 |
|---|---|---|
| Article number | | 7112027 |
| Measuring range [1] | Black 10 % | 70 m |
| | Gray 40 % | 100 m |
| | White 80 % | 125 m |
| | Reflector film [2] | 270 m |
| Start of measuring range | | 0.2 m [3] |
| Measuring rate | | 40 kHz |
| Resolution | | 1 mm |
| Linearity | | < ±60 mm [4] |
| Repeatability [5] | | <25 mm |
| Temperature stability | | < 20 ppm / K |
| Light source | | Semiconductor laser < 1 mW, 905 nm (red) |
| Laser class | | Class 1 in accordance with IEC 60825-1: 2022-07 |
| Permissible ambient light | | 50,000 lx |
| Supply voltage | | 10 ... 30 VDC |
| Power consumption | | < 3 W (24 V) |
| Signal input | | Trigger |
| Digital interface | | RS232 / RS422 |
| Analog output | | 4 ... 20 mA (16 bit, freely scalable within the measuring range) |
| Switching output | | Q1 / Q2 (configurable); trigger |
| Connection | | Supply/signal: 12 pin M12 screw/plug connection |
| Mounting | | Mounting holes |
| Temperature range | Storage | -40 … +70 °C (non-condensing) |
| | Operation | -20 … +60 °C (non-condensing) |
| Shock (DIN EN 60068-2-29) | | 30 g / 6 ms in 6 directions, 3 shocks each |
| Vibration (DIN EN 60068-2-6) | | 1 g / 10 … 2000 Hz in 3 axes, 2 cycles each |
| Protection class (DIN EN 60529) | | IP67 |
| Material | | Aluminum housing |
| Weight | | approx. 140 g |
| Control and indicator elements | | 2x LEDs for power and signal |
| Special features | | Measurement-specific operating modes |

[1] Depends on the reflectivity of the target, ambient light interference and atmospheric conditions
[2] ILR-RF250 reflector film 250 x 250 mm; art. 7966001
[3] 0.5 m for measurement with reflector film
[4] Linearity in the ranges of ≤ 1 m and ≥ 70 m is ±100 mm
[5] Repeatability in the ranges ≤ 1 m and ≥ 70 m is ±50 mm

## Light spot diameter




The optoNCDT ILR 1171 sensors use a semiconductor class 1 laser (operating mode) and a semiconductor class 2 laser (setup mode).
Devices of this laser classes require no special safety precautions.

# Connection possibilities
# optoNCDT ILR

ILR104x

**Supply and output cables**

| | | |
|---|---|---|
| 29011586 | PC1040-10 | Supply-/output cable, 10 m |
| 29011587 | PC1040-2 | Supply-/output cable, 2 m |
| 29011588 | PC1040/90-2 | Supply-/output cable, 2 m |
| 29011589 | PC1040-5 | Supply-/output cable, 5 m |
| 29011590 | PC1040/90-5 | Supply-/output cable, 5 m |
| 29011590 | PC1040-10 | Supply-/output cable, 10 m |
| 29011591 | PC1040/90-10 | Supply-/output cable, 10 m |
| 29011592 | PC1040-20 | Supply-/output cable, 20 m |
| 29011593 | PC1040/90-20 | Supply-/output cable, 20 m |

ILR2250-100-IO

**Supply and output cables**

| | | |
|---|---|---|
| 29011362 | PC2250-5 IO-Link | Supply-/output cable, 5 m |
| 29011363 | PC2250-10 IO-Link | Supply-/output cable, 10 m |
| 29011364 | PC2250-15 IO-Link | Supply-/output cable, 15 m |

ILR3800-100
ILR3800-100-H

**Supply and output cables**

| | | |
|---|---|---|
| 29011609 | PCF3800-30/IF2004 | Supply-/output cable, 30 m |

(The IF2008-Y adapter cable is required to connect 4x ILR sensors to the IF2004).

**Connection cables**

| | | |
|---|---|---|
| 29011624 | PCE3800-20/IF2008ETH | Connection cable, 20 m |
| 29011623 | PCE3800-10/IF2008ETH | Y-connection cable, 10 m |
| 29011622 | PCE3800-10/IF2008ETH | Connection cable, 10 m |
| 29011621 | PCE3800-5/IF2008ETH | Connection cable, 5 m |
| 29011620 | PCE3800-2/IF2008ETH | Connection cable, 2 m |

Power supply unit PS2020
(Optional for DIN rail
mounting)

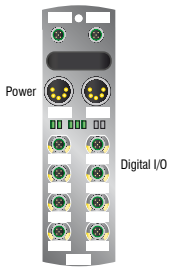
**Supply and output cables**

| | | |
|---|---|---|
| 29011513 | PC3800-2 | Supply-/output cable, 2 m |
| 29011514 | PC3800/90-2 | Supply-/output cable, 2 m |
| 29011515 | PC3800-5 | Supply-/output cable, 5 m |
| 29011516 | PC3800/90-5 | Supply-/output cable, 5 m |
| 29011517 | PC3800-10 | Supply-/output cable, 10 m |
| 29011518 | PC3800/90-10 | Supply-/output cable, 10 m |
| 29011519 | PC3800-20 | Supply-/output cable, 20 m |
| 29011520 | PC3800/90-20 | Supply-/output cable, 20 m |
| 29011521 | PC3800-30 | Supply-/output cable, 30 m |
| 29011522 | PC3800/90-30 | Supply-/output cable, 30 m |

ILR1171

**Supply and output cables**

| | | |
|---|---|---|
| 29011401 | PC1171-2 | Supply-/output cable, 2 m |
| 29011402 | PC1171-5 | Supply-/output cable, 5 m |
| 29011403 | PC1171-10 | Supply-/output cable, 10 m |




IO-Link master

4-channel USB converter
IF2004/USB

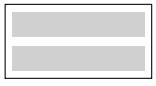
USB

PC

Interface module for
Ethernet connection
IF2008/ETH

Ethernet

PC



Display

Interface module for Industrial
Ethernet connection
IF2035-PROFINET
IF2035-EIP
IF2035-EtherCAT

PROFINET / EIP / EtherCAT

PLC

Interface module from
RS422 to USB
IF2001/USB

USB

PC

# Optional accessories
# optoNCDT ILR

### Reflector film

The sensor measures the distance to moving and stationary objects. The measurable distance can be increased by using a reflective film suitable for the sensor. However, the minimum distance from the sensor to the reflector film must be maintained. The center of the laser spot must be in the center of the reflector over the entire measuring range. Target (reflector) and sensor can only be tilted by at most 5° relative to one another.

| Sensor | Item | Dimensions |
|---|---|---|
| optoNCDT ILR140x | Art. no.: 7966001 ILR-RF250 Reflector film | 250 x 250 mm |
| optoNCDT ILR2250 | Art. no.: 7966058 ILR-RF210 Reflector film | 210 x 297 mm |
| optoNCDT ILR3800 | Art. no.: 7966058 ILR-RF210 Reflector film | 210 x 297 mm |
| optoNCDT ILR1171 | Art. no.: 7966001 ILR-RF250 Reflector film | 250 x 250 mm |

### Protective glass

The sensor can be protected from external influences by using a protective glass.

| Sensor | Item | Description |
|---|---|---|
| optoNCDT ILR2250 | Art. no.: 7966061 ILR-PG2250<br>Protective glass | Optical glass, with anti-reflection coating and high transmission |
| optoNCDT ILR3800 | Art. no.: 7966080 ILR-PG3800<br>Protective glass | |

### Filter glass

Filter glasses enable measurement on highly reflective surfaces. However, this reduces the maximum laser power. Ask your regional sales contact before you use the filter glass.

| Sensor | Item | Description |
|---|---|---|
| optoNCDT ILR2250 | Art. no.: 7966063 ILR-NDF2250 Filter glass 0.75<br>Art. no.: 7966066 ILR-NDF2250 Filter glass 0.5<br>Art. no.: 7966068 ILR-NDF2250 Filter glass 0.9 | Optical gray filter |
| optoNCDT ILR3800 | Art. no.: 7966081 ILR-NDF3800 Filter glass 0.75<br>Art. no.: 7966082 ILR-NDF3800 Filter glass 0.5<br>Art. no.: 7966083 ILR-NDF3800 Filter glass 0.9 | |

### Air purge collar

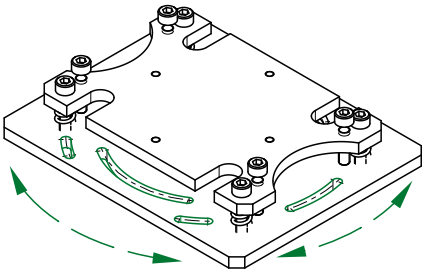
A compressed-air purge collar reliably prevents the deposition of dust and particles on the lens surface, ensuring that the optical performance remains consistently high. In addition, this reduces the cleaning effort and extends the service life of the system.

| Sensor | Item | Description |
|---|---|---|
| optoNCDT ILR2250 | Art. no.: 7966062 ILR-FBV2250<br>Air purge collar | Screwable compressed-air purge collar for cleaning the optical path |
| optoNCDT ILR3800 | Art. no.: 7966087 ILR-FBV3800<br>Air purge collar | |

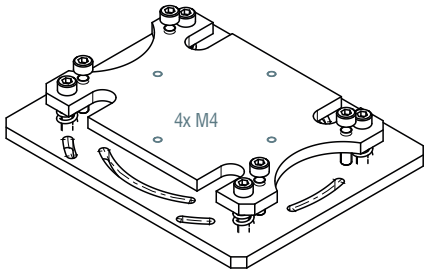
### Mounting plate

The sensor can optionally be fixed using an aluminum plate for mounting. This ensures a secure hold and easy alignment of the sensor. Its robust design is suitable even for harsh industrial environments.

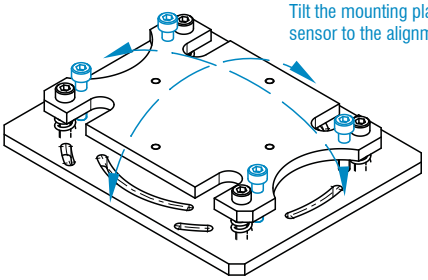
| Sensor | Item | Description |
|---|---|---|
| optoNCDT ILR3800 | Art. no.: 7966076 ILR-MP3800 Mounting plate | Optional; for easy sensor mounting |



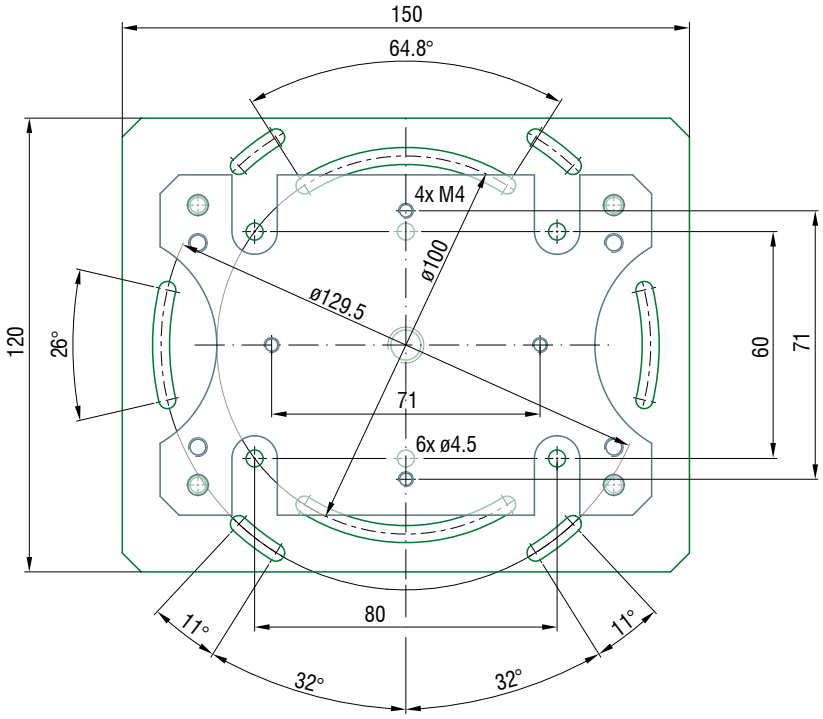
The sensor can optionally be mounted using a mounting plate.




4 mounting threads M4 for sensor mounting, optional: sensor rotated by 90°.



Tilt the mounting plate with sensor to the alignment plate

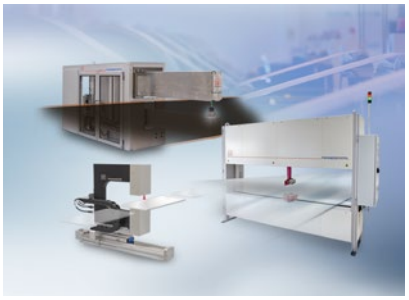



(dimensions in mm, not to scale)

## Sensors and Systems from Micro-Epsilon

Sensors and systems for displacement, distance and position

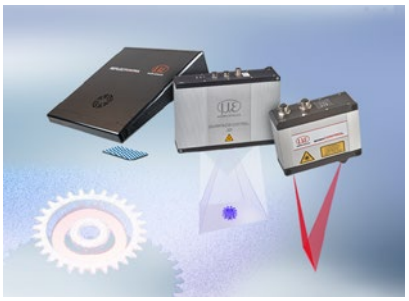
Sensors and measurement devices for non-contact temperature measurement



Measuring and inspection systems for metal strips, plastics and rubber

Optical micrometers and fiber optics, measuring and test amplifiers

Color recognition sensors, LED analyzers and inline color spectrometers



3D measurement technology for dimensional testing and surface inspection



MICRO-EPSILON

MICRO-EPSILON USA
8120 Brownleigh Dr. · Raleigh, NC 27617 / USA
Phone +1/919/787-9707 · Fax +1/919/787-9706
me-usa@micro-epsilon.com · **www.micro-epsilon.com**