MICRO-EPSILON

More Precision

optoNCDT ILR // Laser-optical distance sensors

IO-Link – the communication standard for automation technology

- Quick and easy device replacement
- Fast commissioning
- Compatible with all common fieldbus and automation systems
- Globally standardized according to IEC 61131-9

Smart key technology for Industry 4.0

IO-Link is an open, standardized, fieldbus-independent digital interface (IEC 61131-9) that enables bidirectional communication between sensors and actuators down to the lowest field level. This makes it a key component of intelligent automation solutions and accelerates the implementation of Industry 4.0 through consistent data availability.

Its fieldbus neutrality allows IO-Link to be easily integrated into established automation landscapes such as PROFINET, EtherNet/IP, or Modbus. It acts as an efficient bridge between analog sensors and modern network control.

IO-Link – briefly explained

An IO-Link master can consist of 2, 4, 8, or 16 bidirectional IO-Link ports. These ports can be connected to an IO-Link hub or an IO-Link device (sensor, actuator) via a point-to-point connection using data lines. With the intermediate IO-Link hubs, signals from the sensors/actuators connected are forwarded directly to the IO-Link master. An IO-Link hub can also have 2, 4, 8, or 16 ports. This increases efficiency and connectivity. The sensors can be integrated into existing IO-Link systems as slaves.

Micro-Epsilon: IO-Link-compatible products

IO-Link is a globally standardized, fieldbus-independent interface that enables end-to-end communication down to the lowest field level, thus supporting Industry 4.0 applications. Micro-Epsilon offers, among other things, the optoNCDT ILR3800-IO and ILR1040-IO laser distance sensors, which are characterized by high precision and robust design.

Other Micro-Epsilon product groups already feature IO-Link. Micro-Epsilon is thus expanding its portfolio with future-proof, flexibly integrable sensor solutions for networked automation.
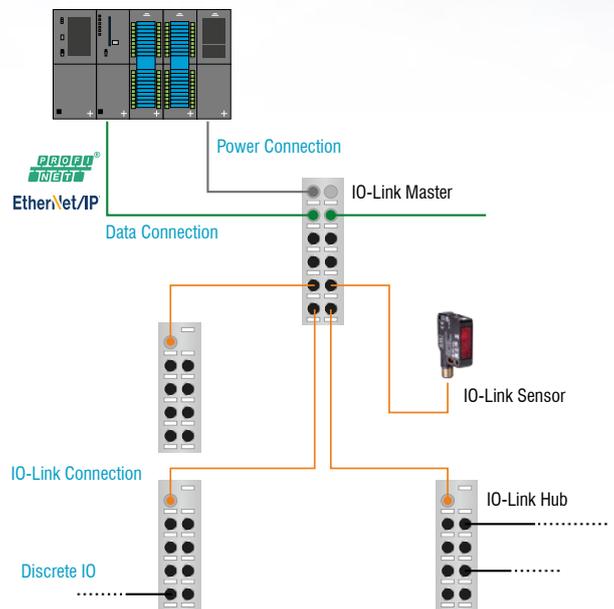
Key advantages of IO-Link

❶ **Standardized, fieldbus-independent communication**
The open standard (IEC 61131-9) offers easy integration and future-proof applications in heterogeneous automation environments

❷ **Easy installation & minimal cabling**
IO-Link works with standard cables, reducing installation efforts, costs, and EMC requirements

❸ **Automatic parameterization & quick device changes**
Smooth sensor replacement, devices are recognized automatically

❹ **Transparent diagnostics and smart maintenance**
In addition to process data, devices also provide status and diagnostic data. Remote diagnosis is possible.

❺ **Higher plant availability and process optimization**
Real-time data enables production optimization, fewer downtimes, and higher energy efficiency

❻ **High future viability**
Manufacturer independence, and sound standardization ensure robust and open-source implementation of Industry 4.0 solutions.

Ease of use
optoNCDT ILR

sensorTOOL: Easy operation and configuration

The optoNCDT ILR3800 and ILR1171 sensors can be connected to the sensorTOOL and parameterized via numerous interface modules (IF2001/USB, IF2004/USB, and IF2008/ETH). In addition to sensor parameterization, it also enables the display, storage, and export of measured values.

Features

- Data display and scaling via Ethernet and sensorTOOL
- CSV export
- Easy installation without PC admin rights

Measurement modes for ILR3800

- **AUTOMATIC**: For dark, reflective and distant targets – this measurement mode optimizes the measurement frequency of the sensor and therefore provides the best results, even in difficult conditions.

- **FAST:** For fast measurements on moving objects and distance jumps – this measurement mode detects object movements up to 1.6 m/s.

- **ACCURATE:** For high accuracy and tolerance in distance changes.

- **PRECISE:** For highest accuracy – this measurement mode provides precise distance values on well reflecting targets.

- **DYNAMIC:** Optimized for applications with fast and large distance changes – ideal for moving processes in logistics and automation.
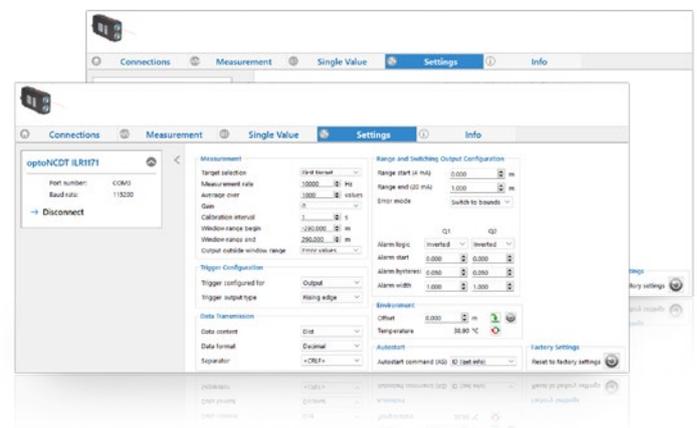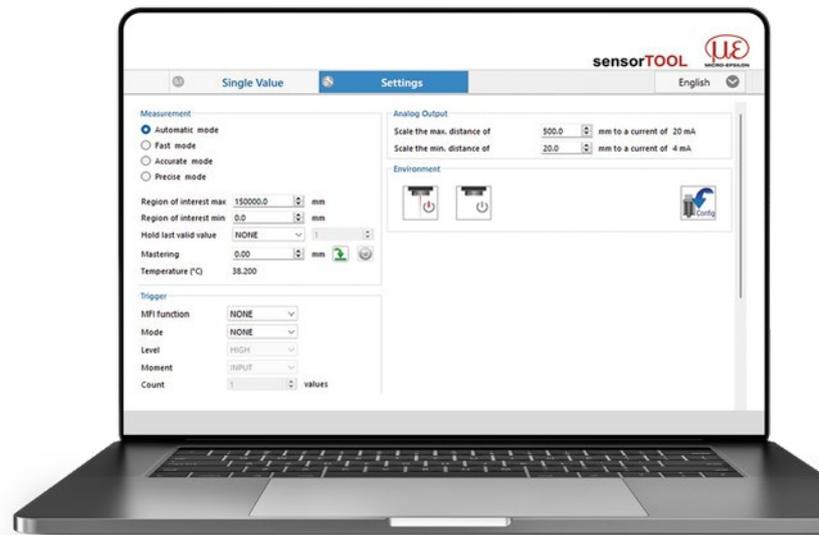

Settings for ILR1171

The Settings tab offers users a wide range of options for customizing the measurement parameters.
For example, the measurement frequency can be precisely adjusted to the respective requirements in order to achieve an optimal balance.

In addition, the range and switching output configurations for the 4 mA and 20 mA interfaces can be flexibly adjusted, enabling seamless integration into different control environments. In addition, the evaluation range can be defined and signal processing configured to optimize measurement results and reliably suppress interference signals. In this way, the settings area provides a central and user-friendly platform for adapting the measuring system precisely to the respective application situation.

Fast laser distance sensor for outdoor applications
optoNCDT ILR1171

- Measuring range up to 125 m, (with reflector 270 m)
- 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 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.
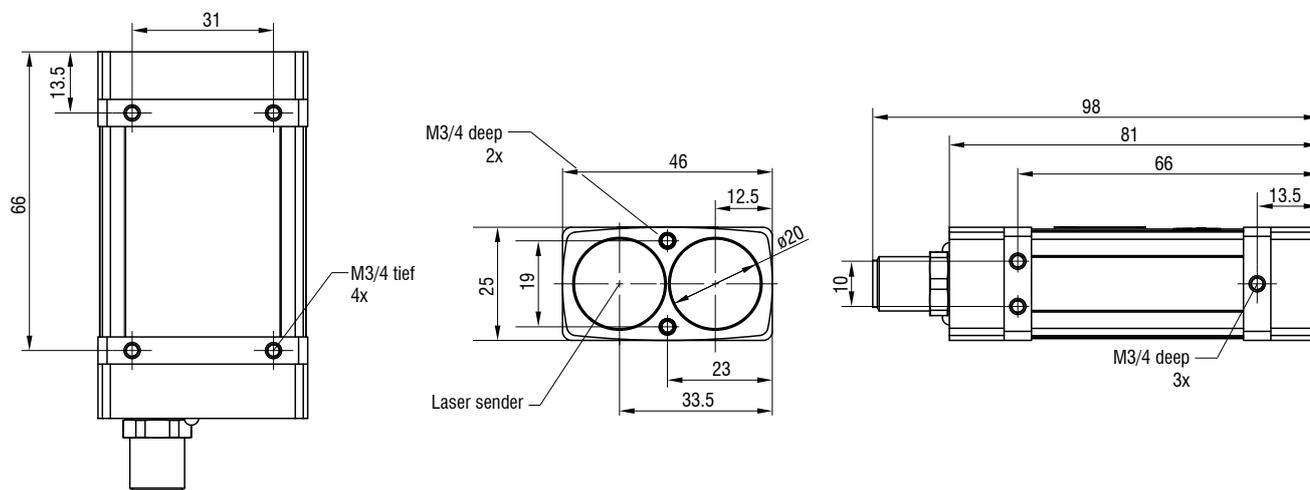
Versatile fields of application

The optoNCDT ILR1171 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 RS232 interfaces ensure reliable and fast data transmission.

Dimensions:

M3/4 deep 2x
M3/4 tief 4x
Laser sender
M3/4 deep 3x

(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
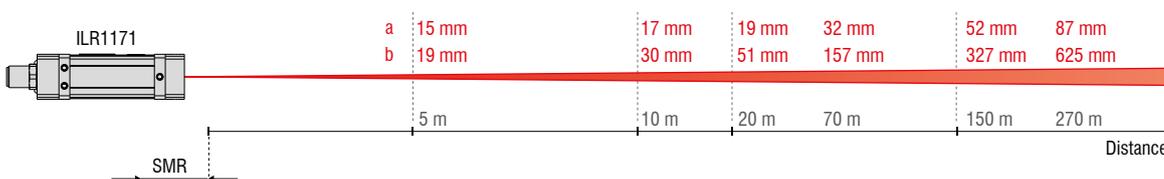[2] ILR-RF250 reflector film 250 x 250 mm; art. 7966001
[3] 0.5 m for measurement with reflector film
[4] Linearity in the ranges of ≤ 1 m and ≥ 70 m is ±100 mm
[5] Repeatability in the ranges ≤ 1 m and ≥ 70 m is ±50 mm

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 in these laser classes require no special safety precautions.

ILR104x

Supply and output cables

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

ILR3800-IO

Supply and output cables

29011669	PC3800-5 IO-Link	Supply and output cable, 5 m
29011670	PC3800-10 IO-Link	Supply and output cable, 10 m
29011671	PC3800-15 IO-Link	Supply and output cable, 15 m
29011672	PC3800-20 IO-Link	Supply and output cable, 20 m

ILR3800
ILR3800-H

Supply and output cables

29011609	PCF3800-30/IF2004	Supply and output cable, 30 m
29011682	PCF3800-100/IF2004	Supply and output cable, 10 m
(to connect 4 ILRs to the IF2004, the IF2008-Y adapter cable is required.)		
2901528	IF2008-Y-adapter cable	

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

Supply and output cables

29011737	PC3800-2/DPU	Supply and output cable, 2 m
29011738	PC3800-5/DPU	Supply and output cable, 5 m
29011739	PC3800-10/DPU	Supply and output cable, 10 m

Supply and output cables

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

Power supply unit PS2020
(Optional for DIN rail mounting)

ILR1171

Supply and output cables

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