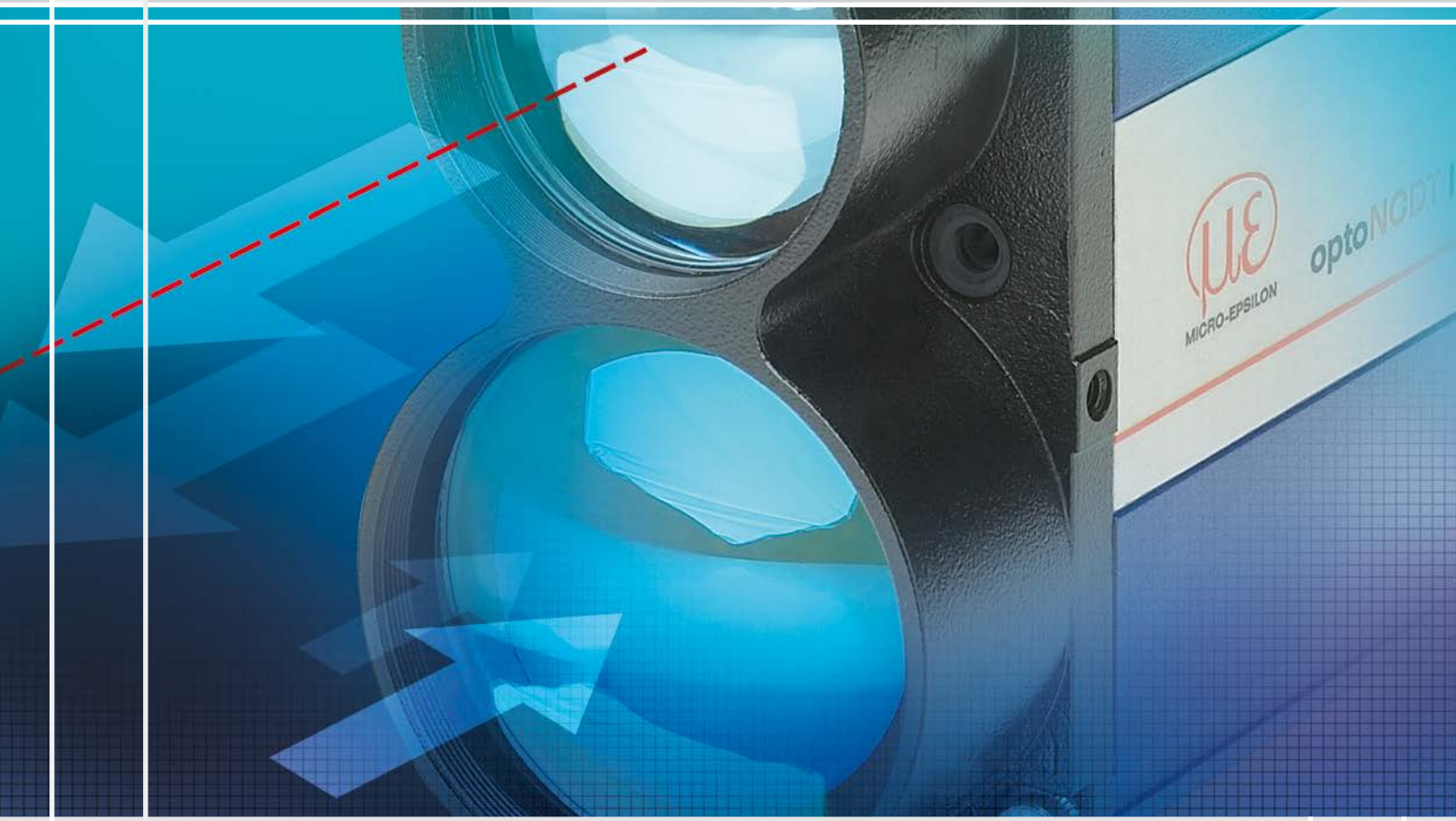
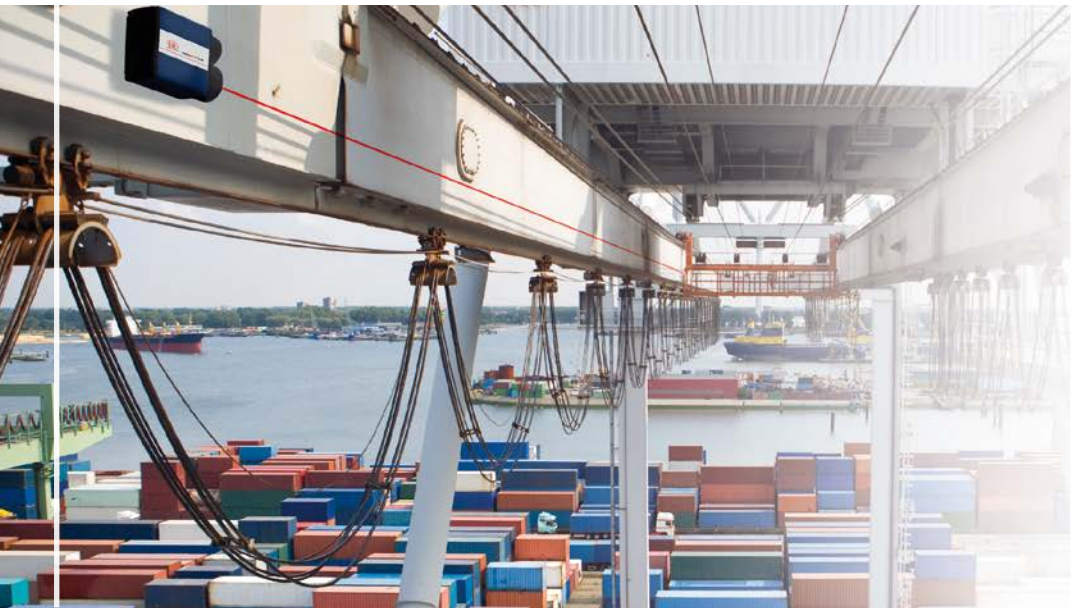
MICRO-EPSILON

More Precision

optoNCDT ILR // Laser-optical distance sensors





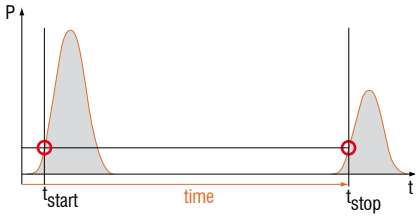
- *Non-contact distance measurement:*
  up to 300 m without reflector
  up to 3000 m with reflector
- *Excellent repeatability and linearity*
- *Fast response time*
- *Compact design*
- *Various interfaces*
- *Sighting laser can be activated*
- *Excellent price/performance ratio*

Laser distance sensors

optoNCDT ILR sensors are optoelectronic sensors for non-contact displacement, distance and also speed measurements. Their large measuring range enables to measure on critical surfaces such as, e.g. hot metals, from a safe distance or to regulate large travel displacements with a small installation size. Wear-free measurements and thus a long service life are possible due to the non-contact measuring principle. Depending on the application, four sensor series are available focusing on different aspects (e.g. accuracy, measurement speed). These sensors are designed for operation with and without reflector and are thus very flexible to use. Due to their robust construction and compact design, the ILR sensors are used indoors and outdoors for many different measurement tasks, both for static and moving measurement objects. A sighting laser can be activated to easily place the sensor in the correct position.

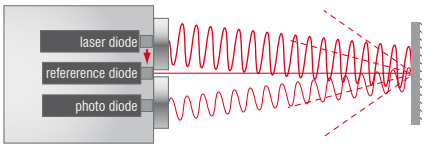
Time-of-flight principle

The ILR103x and 119x sensors operate according to the time-of-flight measuring principle. A laser diode in the sensor produces short laser pulses that are projected onto the target. The light reflected from the target is recorded by the sensor element. The time of flight of the light pulse to the target and back determines the measurement distance. The integrated electronics in the sensor calculates the distance based on the time of flight and conditions the signal for analog and digital output. optoNCDT ILR sensors are resistant to ambient light.



Phase comparison principle

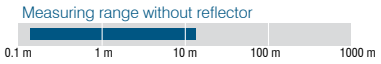
The ILR118x sensors operate according to the phase comparison principle. High frequency modulated laser light with low amplitude is transmitted to the target. Depending on the distance of the object, the distance changes the phase relationship between transmitted and received signal. Sensors of this principle work very precisely over measuring ranges up to 150 meters.

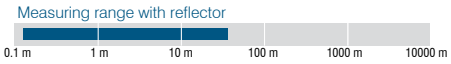


Compact & reliable
ILR 1030/1031

Pages 4 - 5

- Measuring ranges 0.2 ... 50 m
- Linearity ± 20 mm
- Repeatability < 5 mm
- Resolution 1 mm
- Measurement with / without reflector
- Analog output 4 ... 20 mA
- Compact plastic housing
- Easy alignment onto the target
- Models with laser classes 1 and 2
- IP65

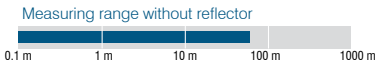


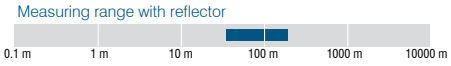


Industrial standard with high precision
ILR 1181/1182/1183

Pages 6 - 7

- Measuring ranges 0.1 ... 150 m
- Linearity ± 2 ... ± 5 mm
- Repeatability < 0.5 mm
- Resolution 0.1 mm
- Measurement with / without reflector
- Interfaces RS232 / RS422 / SSI / Profibus
- Analog output 4 ... 20 mA
- Option with integral heating
- Small measurement spot size
- IP65

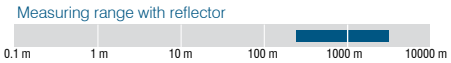




High performance & high speed
ILR 1191

Pages 8 - 9

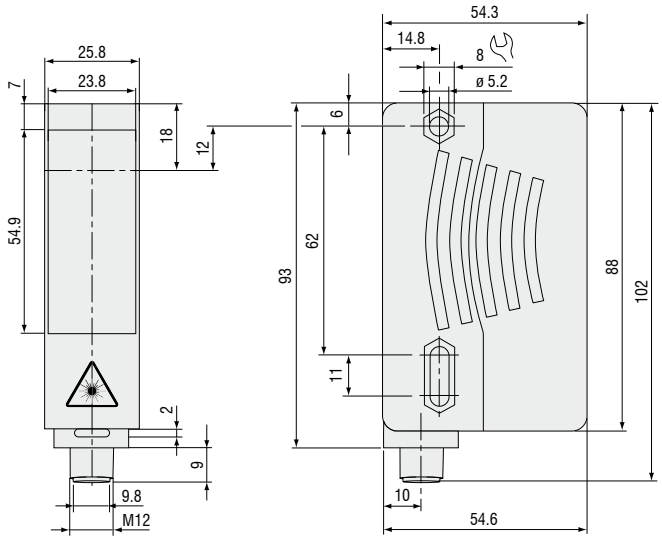
- Measuring ranges 0.5 ... 3000 m
- Linearity ± 20 ... ± 60 mm
- Repeatability < 20 mm
- Resolution 1 mm
- Measurement with / without reflector
- Distance and speed measurements
- Interfaces RS232 / RS422 / SSI / Profibus
- Analog output 4 ... 20 mA
- Very high measuring rate
- With integral heating
- IP67

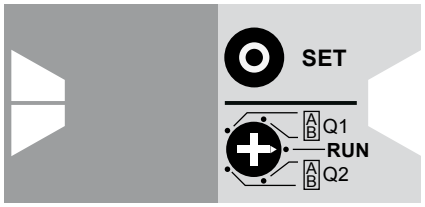


- *Measuring range up to 15 m onto diffuse reflecting surfaces, 50 m onto reflector*
- *Fast response time*
- *Small size*
- *Excellent price-performance ratio*

The ILR1030/1031 laser distance sensors operate according to the time-of-flight technology. Based on this technology, these sensors provide accurate, reliable and unambiguous as well as reproducible measurement results regardless of ambient conditions such as surface properties, dark colors or ambient light.

The ILR103x/LC models use a measuring laser with laser class 1.



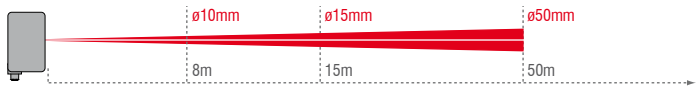


ILR103x: Adjust analog output and switching output via touch keys

Model		ILR1030-8	ILR1030-8/LC1	ILR1030-15	ILR1031-50	ILR1031-50/LC1
Article no.		7112011	7112011.01	7112013	7112012	7112012.01
Measuring range [1]	black 10%	0.2 ... 2.5 m	0.2 ... 2.5 m	0.2 ... 5 m	0.2 ... 5 m	0.2 ... 5 m
	gray 18%	0.2 ... 3.5 m	0.2 ... 3.5 m	0.2 ... 6 m	0.2 ... 6 m	0.2 ... 6 m
	white 90%	0.2 ... 8 m	0.2 ... 8 m	0.2 ... 15 m	0.2 ... 15 m	0.2 ... 15 m
	Reflector	-	-	-	10 ... 50 m (ILR-RF250)	
Linearity [2]		± 20 mm				
Resolution		1 mm				
Repeatability		< 5 mm				
Response time		10 ms				
Light source		semiconductor laser (red 660 nm)				
Laser safety class	EN 60825-1:2007	class 2	class 1	class 2	class 2	class 1
Permissible ambient light		50,000 lx				
Operating temperature [3]		-30 … +50 °C (humidity 5 ... 95 %, non-condensing)				
Storage temperature		-30 … +70 °C				
Switching output		Q1 / Q2 push-pull outputs				
Switching voltage		max. 30 VDC				
Switching current		max. 100 mA				
Analog output		4 ... 20 mA, short-circuit/overload protected				
Temperature stability		≤ 0.25 mm / °C				
Supply		10 ... 30 VDC, class 2				
Connection		4-pin, M12				
Protection class		IP65				
Material	Housing	ABS plastics				
	Window	plastic pane				
Weight		90 g				
EMC		complies with 2014/30/EU				
Accessories		page 10				

[1] depending on target reflectance, ambient light influences and atmospheric conditions
[2] with statistical spread of 95%
[3] when crossing 0 °C additional heating may be required

Spot diameter ILR 1030 / 1031



optoNCDT ILR 103x-LC1 use a semiconductor class 1 laser.
Laser class 1 devices require no special safety precautions.

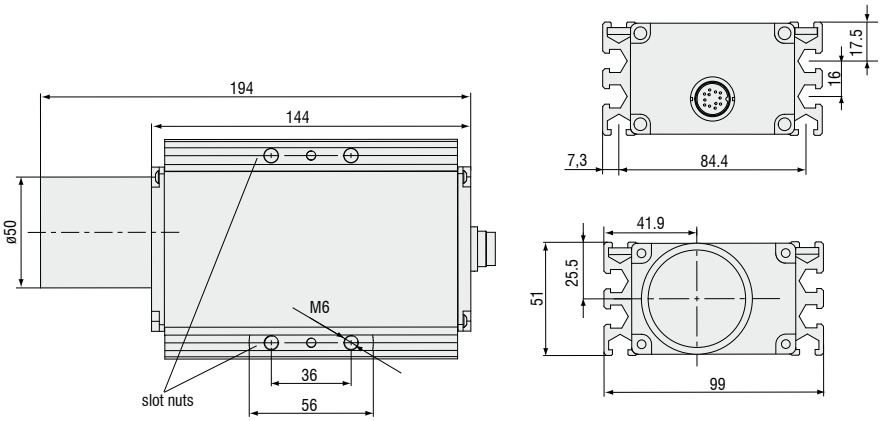
optoNCDT ILR 1030/1031 sensors operate with a semiconductor laser with a wavelength of 660 nm (visible, red). Laser power is <1 mW. The sensors fall within laser class 2.
Laser class 2 devices require no special safety precautions.

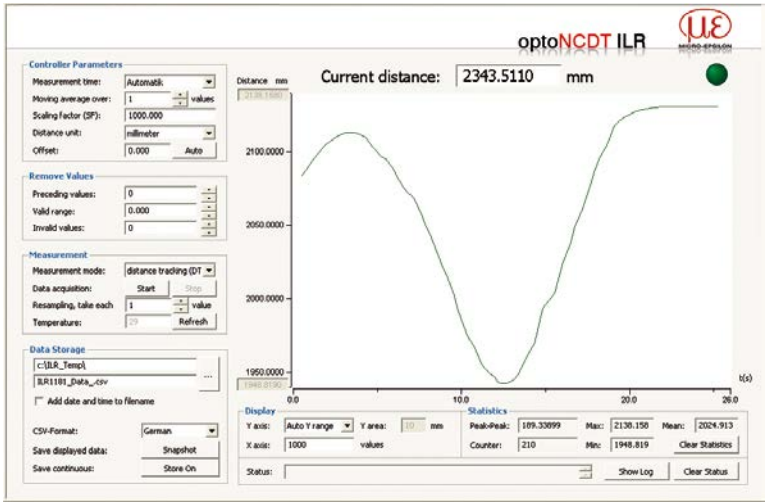
optoNCDT ILR 1181-30 / 1182-30 / 1183-30

- *Measuring range up to 50 m on diffuse reflecting surfaces, up to 150 m with reflector plate*
- *Option with integral heating*
- *Easy alignment with laser sighting*
- *Precise measurement on various surfaces*
- *User-friendly sensor installation*
- *Accessories and special models available*

optoNCDT ILR 1181/1182/1183 sensors are optoelectronic sensors for non-contact distance and displacement measurement for industrial applications. Both sensors operate according to the phase comparison principle, whereby higher precision can be achieved. They can be easily aligned and positioned with a visible laser beam.

The optoNCDT ILR 1182 series operates with a 50 Hz measuring rate and is therefore suitable for fast processes. The mounting grooves on the housing offer flexible mounting options for many situations.



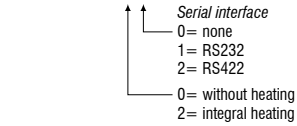


Configuration and measurement software for ILR1181 and ILR1182

Model		ILR1181-30	ILR1182-30	ILR1183-30
Article no.		7112007	7112008	7112009
Measuring range [1]	black 6%	0.4 ... 17 m		
	gray 10%	0.1 ... 30 m		
	white 90%	0.1 ... 50 m		
	Reflector film	50 ... 150 m (reflective foil ILR-RF118x)		
Linearity [2]		± 2 mm (+15 … +30 °C), ± 5 mm (- 40 … +50 °C)		
Resolution		0.1 mm		
Repeatability		≤ 0.5 mm		
Response time [1]		100 ms ... 6 s	20 ms ... 6 s	20 ms ... 6 s
Light source		semiconductor laser (red 650 nm)		
Laser safety class	EN 60825-1:2014	class 2		
Operating temperature		-10 … + 50 °C (optional -40 … +50 °C, with integral heating)		
Storage temperature		-40 …+70 °C		
Switching output		Q1 (max. 500 mA)		Q1 / Q2 (max. 500 mA)
Switching points		freely adjustable		
Switching hysteresis		freely adjustable		
Trigger input (not with integral heating)		adjustable trigger edge and delay, trigger pulse max. 24 V		
Serial interface		RS232 or RS422 [3] adjustable, max. 38.4 kBaud		SSI interface (RS422), 24Bit, gray-coded, 50kHz … 1MHz
Profibus [3]		-		Profibus (RS485) 9.6 kBaud … 12 MBaud [3]
Operating mode		individual measurement, external triggering, distance tracking, continuous measurement		
Analog output		4 … 20 mA (16 Bit DA)		-
Temperature stability		≤ 50 ppm / °C		
Supply		10 … 30 VDC		
Max. power consumption		< 1.5 W at 24 V (< 24 W with heating)		< 3.2 W at 24 V (< 26 W with heating)
Connection		12-pin M16		1 x 12-pin M16 2 x 5-pin M12 B-encoded
Protection class		IP65		
Housing material		aluminum strangeness profile, powder-coated		
Vibration/shock		500 g, 0.5 ms, 1 shock in each direction (DIN ISO 9022-30-08-1)		
		10 g, 6 ms, 1000 shocks in each direction (DIN ISO 9022-3-31-01-1)		
Weight		980 g		
EMC		complies with 2014/30/EU		
Accessories		page 10		

[1] depending on target reflectance, ambient light influences and atmospheric conditions
[2] with statistical spread of 95%
[3] sensor configuration via interface

Product identification
ILR 118x - 30 (x x)

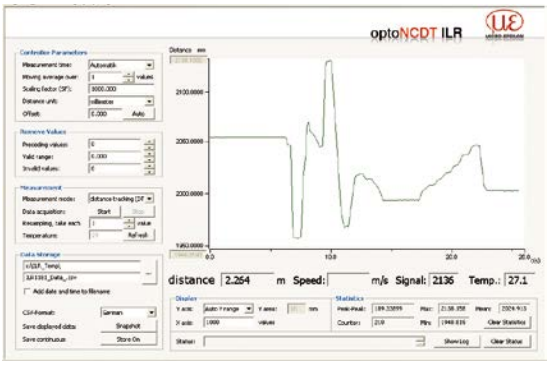


Spot diameter ILR1181/1182/1183

optoNCDT ILR 1181/1182/1183 sensors operate with a wavelength of 650 nm (visible, red). Laser power is <1 mW. The sensors fall within laser class 2. Laser class 2 devices require no special safety precautions.

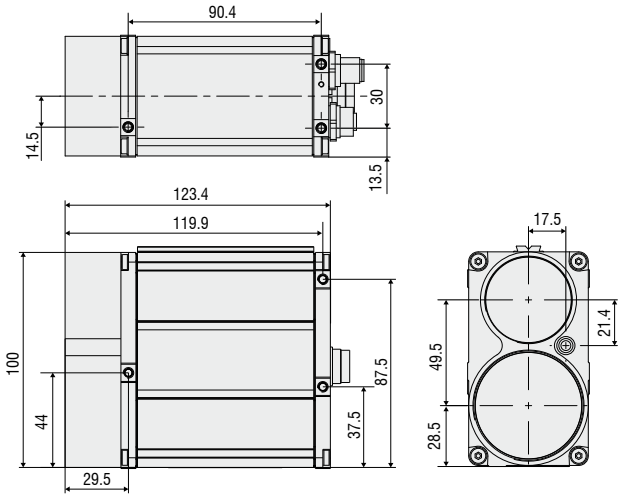
- *Measuring range up to 500 m onto diffuse reflecting surfaces, up to 3000 m with reflector plate*
- *Distance and speed measurement*
- *Integral heating*
- *For very high measuring rates and high speed applications*
- *Easy installation*
- *Accessories and special models available*

optoNCDT ILR 1191 sensors are optoelectronic sensors for non-contact distance and speed measurement for industrial use. 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. The sensor operates according to the laser pulse time-of-flight 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. For outdoor use, the optoNCDT ILR 1191 is equipped with integral heating and protected to IP67.

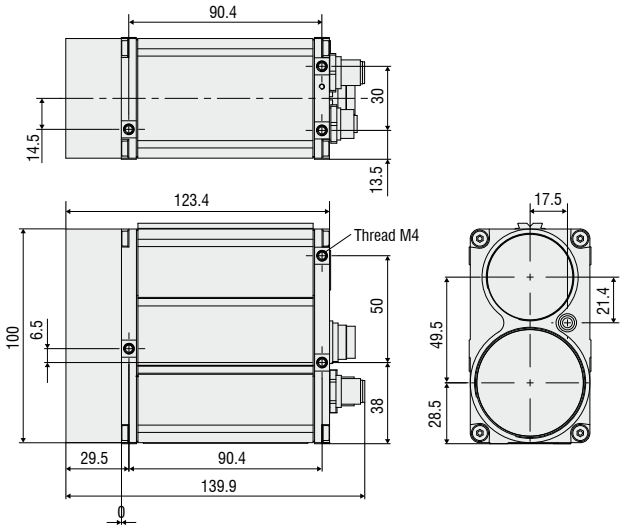


Configuration and measurement software for ILR1191

Models with serial interface



Models with SSI interfaces / Profibus



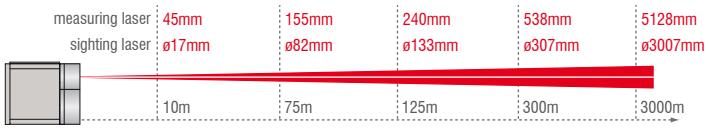
Model		ILR1191-300
Article no.		7112010
Measuring range [1]	black 6%	1 ... 150 m
	gray 10%	0.5 ... 200 m
	white 90%	0.5 ... 300 m
	Reflector film	300 ... 3000 m (ILR-RF250)
Speed		0 ms^{-1} to 100 ms^{-1}
Linearity [2]		± 20 mm (at measurement output 100 Hz) ± 60 mm (at measurement output 2 kHz)
Resolution		1 mm
Repeatability		≤ 20 mm
Response time	Distance measurement	0.5 ms
	Speed measurement	12 ms
Light source		measuring laser (infrared 905 nm) sighting laser (red 635 nm)
Laser safety class	EN 60825-1:2014	measuring laser (laser class 1) sighting laser (laser class 2)
Operating temperature		-40…+60 °C
Storage temperature		-40…+70 °C
Switching outputs		Q1 / Q2 (max. 200 mA)
Switching points		freely adjustable
Switching hysteresis		freely adjustable
Trigger input		adjustable trigger edge and delay, trigger pulse max. 30 V
Serial interface		RS232 and RS422 with 1.2 kBaud … 460.8 kBaud SSI interface (RS422), 24Bit, gray-coded, 50 kHz … 1 MHz
Profibus		RS485, 9.6 kBaud … 12 MBaud
Operating mode		individual measurement, continuous measurement, external triggering, speed measurement
Analog output		4 … 20 mA (16 Bit DA)
Temperature stability		≤ 50 ppm / °C
Supply		10 … 30 VDC
Max. power consumption		< 5 W without heating, 11.5 W with heating
Connection		1 x 12-pin M16, 2 x 5-pin M12 B-coded
Protection class		IP67
Housing material		aluminum strangeness profile, powder-coated
Weight		800 g (depending on the equipment)
Vibration/shock		500 g, 0.5 ms, 1 shock in each direction (DIN ISO 9022-30-08-1)
		10 g, 6 ms, 1000 shocks in each direction (DIN ISO 9022-3-31-01-1)
EMC		complies with 2014/30/EU
Accessories		page 10

[1] depending on target reflectance, ambient light influences and atmospheric conditions
[2] with statistical spread of 95%

Product identification
ILR 1191 - 300 (0 x)

Serial interface
1= RS232
2= RS422
3= RS232 + SSI
4= RS232 + Profibus

Spot diameter ILR1191



optoNCDT ILR 1191 use a semiconductor class 1 laser (operating mode) and a semiconductor class 2 laser (setup mode). Devices of the laser classes 1 and 2 require no special safety precautions.

Accessories

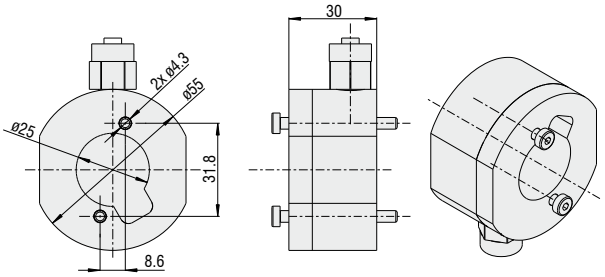
Supply and output cable ILR10xx		
Art. No.	Description	
2901232	PC1000-2	Length 2 m
2901233	PC1000/90-2	Length 2 m, 90° connector
2901234	PC1000-5	Length 5 m
2901235	PC1000/90-5	Length 5 m, 90° connector
2901268	PC1000/90-10	Length 10 m, 90° connector

Supply and output cable ILR11xx		
Art. No.	Description	
2901524	PC1100-3	Length 3 m
2901239	PC1100/90-3	Length 3 m, 90° connector
2901573	PC1100-5	Length 5 m
2901235	PC1100/90-5	Length 5m, 90° connector
2901236	PC1100/10	Length 10 m
2901241	PC1100/90-10	Length 10 m, 90° connector
2901237	PC1100/20	Length 20 m
2901242	PC1100/90-20	Length 20 m, 90° connector
2901238	PC1100/30	Length 30 m
2901243	PC1100/90-30	Length 30 m, 90° connector
0323241	FC1100	Cable connector
0323242	FC1100/90	Cable connector, 90° (angled)
2901551	PC1100/90-3/RS232	Length 3 m, 90° connector, RS232

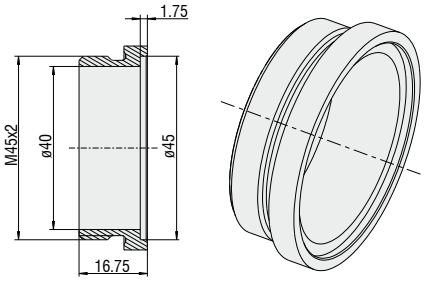
Profibus		
Art. No.	Description	
2901435	PBC1100-I/O-5	Profibus input and output cable, 5 m
2901436	PBC1100-I-5	Profibus input cable, 5 m
2901437	PBC1100-I-10	Profibus input cable, 10 m
2901438	PBC1100-O-5	Profibus output cable, 5 m
2901439	PBC1100-O-10	Profibus output cable, 10 m
0323310	PBFC1100	Profibus socket
0323311	PBMC1100	Profibus plug
0323312	PBLR1100	Profibus terminating resistor

Accessories for ILR10xx series		
Art. No.	Description	
7966001	ILR-RF250	Reflector film 250 x 250 mm
7966002	ILR-R250	Reflector 250 x 250 mm

Accessories for ILR 118x / 1191 series		
Art. No.	Description	
7966014	ILR-MP1191	Mounting plate for ILR1191
7966015	ILR-AA1191	Aligning aid for ILR1191
7966016	ILR-PT1191	Protection tube, 100 mm for ILR1191
7966019	ILR-RF118x	Reflector film 250 x 250 mm for ILR1181X
7966020	ILR-MT118x	Mounting clamp for ILR118x
7966025	ILR-MP118x	Mounting plate for ILR118x
7966021	ILR-MTN118x	Slot nuts for ILR118x
7966022	ILR-FBV118x	Air purge collar for ILR118x
7966023	ILR-PG118x	Protective glass for ILR118x
7966024	ILR-FV118x	Filter adapter for ILR118x
2213025	IF2001/USB	RS422/USB converter



ILR-FBV118x air purge collar for ILR118x



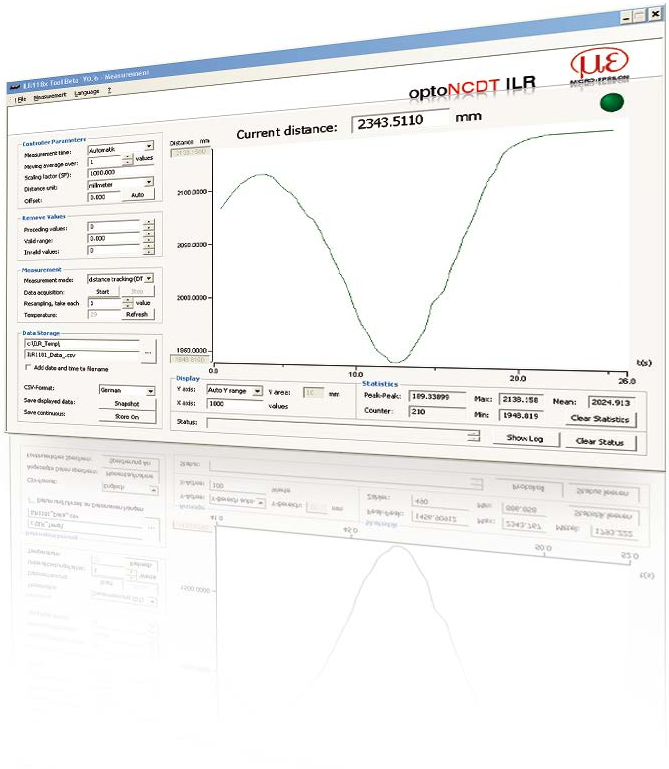
ILR-PG118x protection glass for ILR118x

Free setup and configuration software

The scope of supply includes software for easy sensor configuration. The settings can be implemented conveniently via a Windows user interface on the PC. The sensor parameters are transmitted to the sensor via the serial port and can also be saved if required. The software also contains a module which can display and store the measurement results. The sensor is connected to the PC via the sensor cable using a USB converter.

Free download

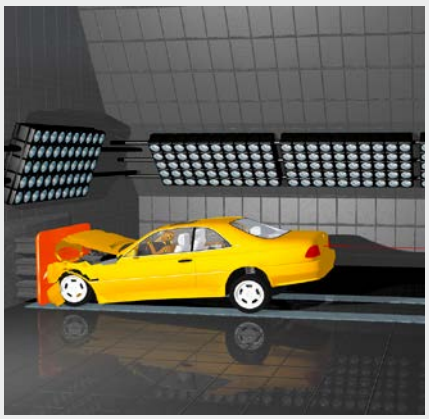
Download free of charge from www.micro-epsilon.com/download: software and driver for easy sensor integration in existing software.



Applications

Position measurement on gantry cranes

Numerous measurement tasks on gantry cranes must be performed: Positioning of the trolley, detection and dimensioning of containers and monitoring of the minimum clearance between the cranes. The ILR1191 with a very large measuring range and low response time is designed for these measurement tasks.

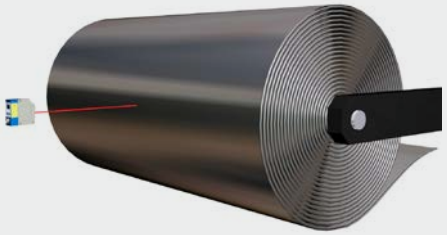


Crash test speed measurement

At acceleration of cars during crash tests, an ILR1191 measures the impact speed and deformation of the test vehicle.

Filling level measurement in silos

Depending on the required accuracy, laser distance sensors determine the filling level of silos at up to four points. Based on these distances, the filling level is calculated.



Acquisition of coil diameters

The quantity of steel wound on and off is monitored via the acquisition of coil diameters using laser probes.

Sensors and Systems from Micro-Epsilon

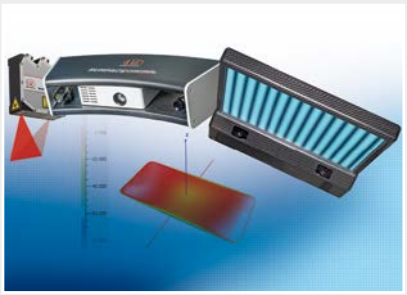
Sensors and systems for displacement, distance and position

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 Eltrotec GmbH
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