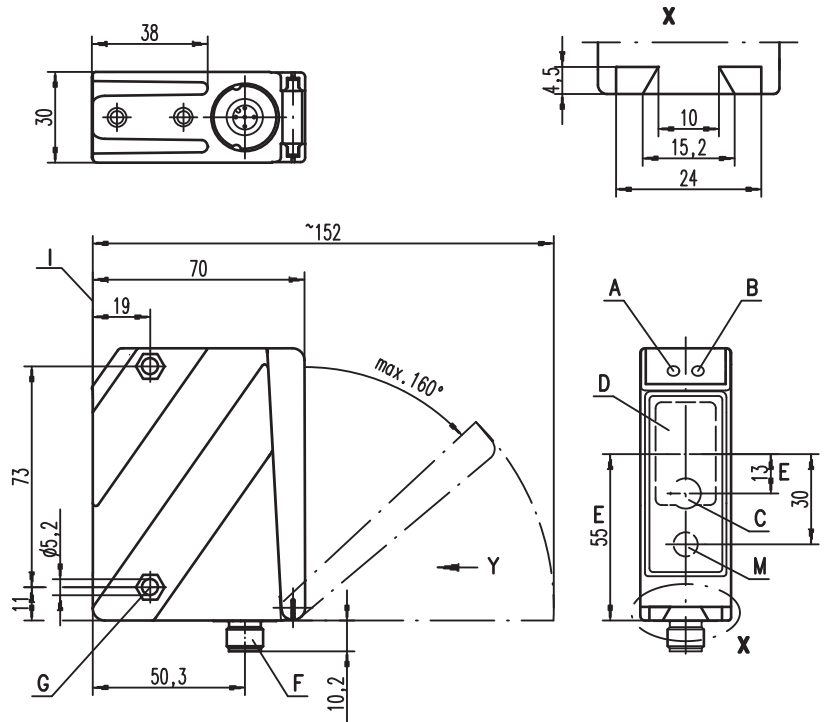


ODSIL 96B

Optical laser distance sensors



Dimensioned drawing



- A Green indicator diode
- B Indicator diode yellow
- C Transmitter (infrared light) for distance measurement
- D Receiver
- E Optical axis
- F Device plug M12x1
- G Countersinking for SK nut M5, 4.2mm deep
- H OLED display
- I Reference edge for the measurement (cover glass)
- K Key pad
- L Green and yellow indicator diodes
- M Transmitter (red light) as alignment aid
- N Button for switching red alignment laser on/off

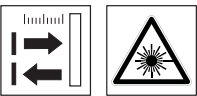
Electrical connection

ODSIL 96B M/L-S12

18-30V DC +	1	br/BN
Do not connect	2	ws/WH
GND	3	bl/BU
I/O-Link Data	4	sw/BK
Do not connect	5	gr/GY

en 01-2015/01 50128409

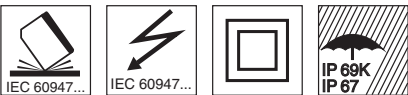
We reserve the right to make changes • DS_ODSIL96BML_en_50128409.fm



0.3 ... 10m



- Measurement range up to 10000mm at 90% diffuse reflection
- Reflection-independent distance information up to 6000mm
- Infrared laser diode with laser class 1
- Switchable alignment aid with red light laser diode with laser class 1
- Highly insensitive to extraneous light
- IO-Link interface
- PC/OLED display and membrane keyboard for configuration
- Measurement value is indicated in mm on OLED display
- Measurement range and mode adjustable



Accessories:

(available separately)

- Mounting systems
- Cable with M12 connector (K-D ...)
- IO-Link USB master V2.0 (SET MD12-US2-IL1.1 + accessories, part no. 50121098)

Specifications

Optical data

Measurement range	300 ... 10000mm (90% diffuse reflection), 300 ... 6000mm (6 ... 90% diffuse reflection)
Resolution	3mm
Light source	laser
Wavelength	measurement laser: 785nm (infrared light), alignment laser: 658nm (visible red light)
Light spot	approx. 7x7mm ² at 10m
Max. output power	measurement laser: 268mW, alignment laser: 190mW
Pulse duration	measurement laser: 6.5ns, alignment laser: 6.5ns

Error limits (relative to measurement range end value 6000mm)

Absolute measurement accuracy ¹⁾	± 0.5%
Repeatability ²⁾	± 5mm
B/W detection thresh. (6 ... 90% rem.)	± 10mm
Temperature drift	± 1.5mm/K

Timing

Measurement time	"Fast" operating mode: 2.8ms "Standard" operating mode: 20ms "Precision" operating mode: 100ms (factory setting)
Delay before start-up	≤ 300ms

Electrical data

Operating voltage U _B	18 ... 30V (incl. residual ripple)
Residual ripple	≤ 15% of U _B
Open-circuit current	≤ 150mA

Sensor operating mode

IO-Link	COM2 (38.4kBaud), Frame 2.2, Vers. 1.0, min. cycle time 2.2ms
SIO	not supported

Indicators

Green LED continuous light off	ready No voltage
Yellow LED continuous light off	object within measurement range no object within measurement range

Mechanical data

Housing	diecast zinc
Optics cover	glass
Weight	380g
Connection type	M12 connector

Environmental data

Ambient temp. (operation/storage)	-20°C ... +50°C / -30°C ... +70°C
Protective circuit ³⁾	1, 2, 3
VDE safety class ⁴⁾	II, all-insulated
Degree of protection	IP 67, IP 69K ⁵⁾
Laser class	1 (acc. to EN 60825-1)
Standards applied	IEC 60947-5-2

- 1) For 300 ... 6000mm measurement range, luminosity coefficient 6% ... 90%, "Precision" operating mode, floating average calculation taking 30 measurement values into account, at 20°C after 20 min. warmup time, medium range of U_B, measurement object ≥ 50x50mm²
- 2) Same object, identical environmental conditions, "Precision" operating mode, floating average calculation taking 30 measurement values into account, after 20 min. warmup time, measurement object ≥ 50x50mm²
- 3) 1=transient protection, 2=polarity reversal protection, 3=short circuit protection for all outputs
- 4) Rating voltage 250VAC, with cover closed
- 5) IP 69K test in accordance with DIN 40050 part 9 simulated, high pressure cleaning conditions without the use of additives. Acids and bases are not part of the test

Order guide

	Designation	Part no.
IO-Link interface	ODSIL 96B M/L-S12	50127488

Tables

Diagrams

Remarks

Operate in accordance with intended use!

- ⚠ This product is not a safety sensor and is not intended as personnel protection.
- ⚠ The product may only be put into operation by competent persons.
- ⚠ Only use the product in accordance with the intended use.

- The red light laser diode is used exclusively as an alignment aid. The beam radiates at a distance of 17mm parallel to the infrared measurement beam (see dimensioned drawing).

Laser safety notices


ATTENTION, VISIBLE AND INVISIBLE LASER RADIATION – LASER CLASS 1

The device satisfies the requirements of IEC 60825-1:2007 (EN 60825-1:2007) safety regulations for a product in **laser class 1** as well as the U.S. 21 CFR 1040.10 regulations with deviations corresponding to "Laser Notice No. 50" from June 24th, 2007.

- ↳ Adhere to the applicable legal and local regulations regarding protection from laser beams.
- ↳ The device must not be tampered with and must not be changed in any way.
 - There are no user-serviceable parts inside the device.
 - Repairs must only be performed by Leuze electronic GmbH + Co. KG.

IO-Link process data

Output data device

Data bit															
A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0
MSB	16 bit measurement value														LSB

16 bit measurement value:	distance
1 bit output resolution:	1 mm
Signal too weak:	10501
Signal failure:	10502

IO-Link service data

Sensors with IO-Link interface can be configured and diagnosed via the service data.

Parameters

Measure mode

A measurement mode for adapting to the application task can be activated with this parameter.

There is a selection of three measurement modes (standard, precision, speed). By selecting the mode, the following results are achieved:

- **Standard:** standard setting
- **Precision:** factory setting, twice as accurate as the standard setting, approx. 5 times slower
- **Speed:** three times less accuracy than the standard setting, approx. 8 times faster

The following table provides an overview of the effects of the individual parameters on the measurement function.

	Accuracy	Measurement time	Measurement value update	Ambient light
Standard	+	10ms	+	++
Precision	++	50ms	--	++
Speed	-	1.4ms	++	++

Measurement filter

A measurement filter for adapting to the application task can be activated with this parameter.

There is a selection of three options (off, averaging, center value). By selecting the filter, the following results are achieved:

- **Off:** no filtering of the measurement values
- **Averaging:** a moving average from the last 2 ... 99 measurement values (setting of the number with `measurement_count`) is calculated and output. If the measurement value changes abruptly, the output value moves linearly over `n` measurements from the old to the new measurement value. The time until the measurement value is updated is therefore not affected by the number of measurements; the response time for distance changes slows down.
- **Center value:** filtering out of extreme values - the average is calculated from 10 ... 50 individual measurements. The number of individual measurements used for this purpose is selected via `measurement_count` (10, 20, 30, 40 or 50). The setting under `filter_depth` specifies whether only the most extreme (`coarse`), the middle (`medium`) or the lowest deviations (`fine`) should be filtered out.

The following table provides an overview of the effects of the individual parameters on the measurement function.

	Updating measurement time	Response time for small change in distance	Response time for large change in distance	Filtering of individual faulty measurements	Filtering of cumulative faulty measurements
Off	+	+	+	--	--
Averaging	+	-	-	0	-
Center value	--	-	-	++	+

Number of measurement values (averaging)

This parameter defines the number of individual measurements which are used for filtering.

Number of measurement values (center value)

This parameter defines the number of individual measurements which are used for filtering.

Filter depth (center value)

This parameter defines the filter gauge (medium, coarse, fine).

Display

This parameter determines the display setting on the sensor (on, off, auto).

Button lock

This parameter determines whether the key pad on the sensor is locked or activated.

System commands:

Laser transmitter activation

This system command switches on the laser transmitter.

Laser transmitter deactivation

This system command switches off the laser transmitter.

If the sensor is deactivated, the last measurement value detected is frozen. The state of the laser can be seen from the sensor status.

Setting to factory setting

This system command restores the factory settings of the sensor.

Diagnostics (observation)

Signal too weak [process value 10501] or signal failure [process value 10502]

Reception signal is not sufficient: either no object is in the measurement range or the signal from the object is too weak for detection. A permanently displayed signal failure indicates that the sensor has a defect.

Signal warning

Low reception signal: the object is not detected reliably, e.g. because the signal from the object is very weak.

Laser activation

Status information on whether the laser transmitter is activated or deactivated.

Measurement range sensor

Status information on whether an object is located in the measurement range of the sensor.



Notice!

If parameters are changed on the device via the display and keyboard, the master is not signaled. In the event the master sends an explicit request, however, the changed value is available.



Notice!

Detailed information about the IO-Link service data and the IODD can be found at www.leuze.com.