

ODS10

Optical distance sensors

en 04-2016/08 50129321



- Measurement range up to 25000mm on HighGain foil
- Analog current and voltage output (factory setting: current output)
- OLED display and membrane keyboard for configuration
- Configurable measurement range and measure mode
- IO-Link version 1.1
- Measurement value display in mm on OLED display
- Optional input for deactivation of the laser (factory setting) or for teach-in

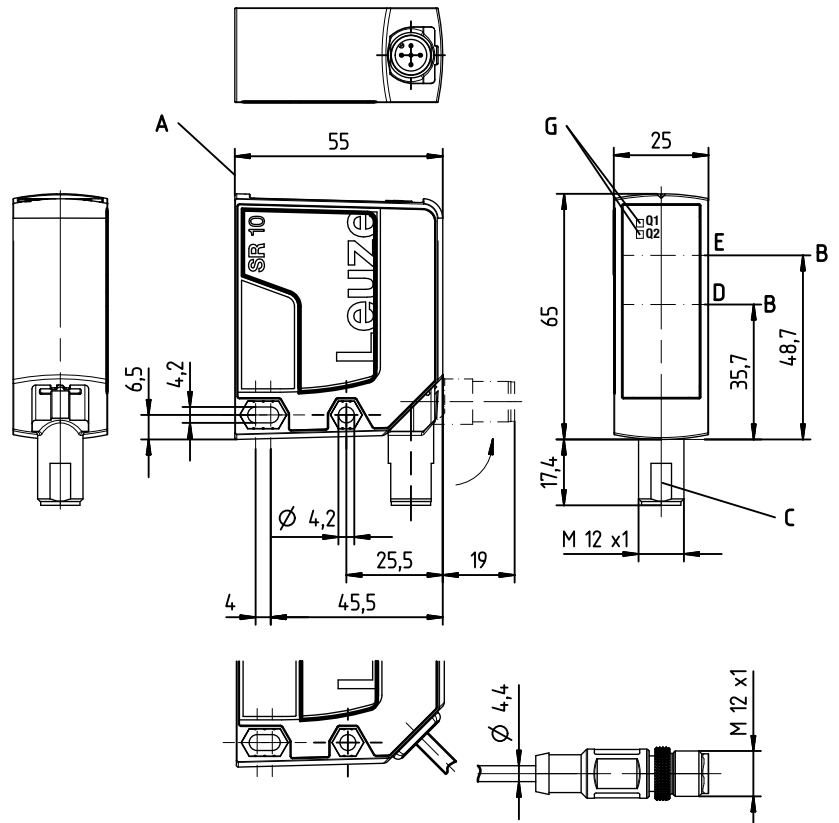
We reserve the right to make changes • DS_ODS10L1_25M8L_en_50129321.fm

Accessories:

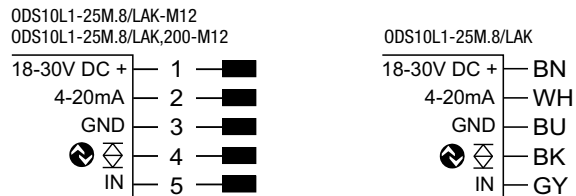
(available separately)

- HighGain reflective tape REF 7-A-100x100 (Part no. 50111527)
- Mounting systems
- Cable with M12 connector (K-D ...)
- IO-Link master set SET MD12-US2-IL1.1 + accessories - diagnostics set (part no. 50121098)

Dimensioned drawing



Electrical connection



Technical data

Measurement data

Measurement range 100 ... 25000mm (on HighGain tape)
 Resolution 1 mm
 Accuracy $\leq \pm 25$ mm ¹⁾
 Reproducibility 0.5 ... 4 mm ²⁾
 Response time 3.4 ... 1020ms, adjustable³⁾, see tables
 Output time 3.4ms ⁴⁾, see tables
 Temperature drift $\leq \pm 2$ mm/K

Optical data

Light source laser
 Laser class 1 (acc. to IEC 60825-1:2007)
 Wavelength 658nm (visible red light)
 Impulse duration 6ns
 Max. output power (peak) 391mW
 Light spot approx. 7x7mm² at 8m

Timing

Measurement time
 "Fast" measure mode: 15 ms
 "Standard" measure mode: 50 ms (factory setting)
 "Precision" measure mode: 200 ms
 "High precision" measure mode: 1000 ms
 for individual measure modes, see Page 3
 Readiness delay ≤ 300 ms

Electrical data

Operating voltage U_B ⁵⁾ 18 ... 30VDC (incl. residual ripple)
 Residual ripple $\leq 15\%$ of U_B
 Open-circuit current ≤ 150 mA
 Switching output push-pull switching output ⁶⁾,
 PNP light switching, NPN dark switching
 Signal voltage high/low $\geq (U_B - 2V) / \leq 2V$
 Analog output ODS10L1-25M.8/LA... voltage 1 ... 10V / 0 ... 10V / 1 ... 5V / 0 ... 5V, $R_L \geq 2k\Omega$
 current 4 ... 20mA, $R_L \leq 500\Omega$ (factory setting)
 COM2 (38.4kBaud), vers. 1.1, min. cycle time 2.3ms,
 SIO is supported

Indicators

Green/red LED Green continuous light ready
 Red no signal
 Orange warning, weak signal
 Off no voltage
 Yellow LEDs Q1/Q2 On object detected

Mechanical data

Housing plastic
 Optics cover glass
 Weight 70g (M 12 connector)
 133g (2m cable)
 90g (cable with M 12 connector)
 Connection type turning M12 connector, 90°
 2m cable, wire cross section 5 x 0.14mm² (5 x 26 AWG)
 0.2m cable with M12 connector

Environmental data

Ambient temp. (operation/storage) -40°C ... +50°C / -40°C ... +70°C
 Protective circuit ⁷⁾ 1, 2, 3
 VDE safety class III
 Degree of protection IP 67
 Standards applied IEC 60947-5-2
 Certifications UL 508, CSA C22.2 No.14-13 ^{5) 8)}

- 1) Typical values, measurement range 100 ... 25000mm, measurement on HighGain foil REF 7-A-100x100, response time 50 ms, "Standard" measure mode, at 20°C after warmup time of 20 min.
- 2) Typical values, statistical value 1 sigma, measurement on HighGain foil REF 7-A-100x100, at 20°C after warmup time of 20 min.
- 3) Factory setting: "Standard" 50 ms
- 4) Factory setting, with filter functions adjustable from 17 ... 1020ms
- 5) For UL applications: use is permitted exclusively in Class 2 circuits according to NEC
- 6) The push-pull switching outputs must not be connected in parallel
- 7) 1=transient protection, 2=polarity reversal protection, 3=short circuit protection for all outputs
- 8) These proximity switches shall be used with UL Listed Cable assemblies rated 30V, 0.5A min, in the field installation, or equivalent (categories: CYJV/CYJV7 or PVVA/PVVA7)

Notes

- You can download the IO Device Description (IODD file) and the *Sensor Studio* configuration software (requires IO-Link USB master) from the Internet at www.leuze.com.

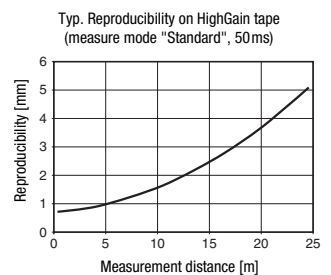
Tables

Measure modes:

Measure mode	Response time	Output time
Fast	15ms	3.4ms
Standard	50ms	3.4ms
Precision	200ms	3.4ms
High precision	1000ms	3.4ms
Individual ¹⁾	3.4...1020ms	3.4ms
Spike suppression ¹⁾	17...1020ms	17...1020ms

1) See "Individual measure modes" on Page 3

Diagrams



Notes

Observe 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 its intended use.

Laser safety notices

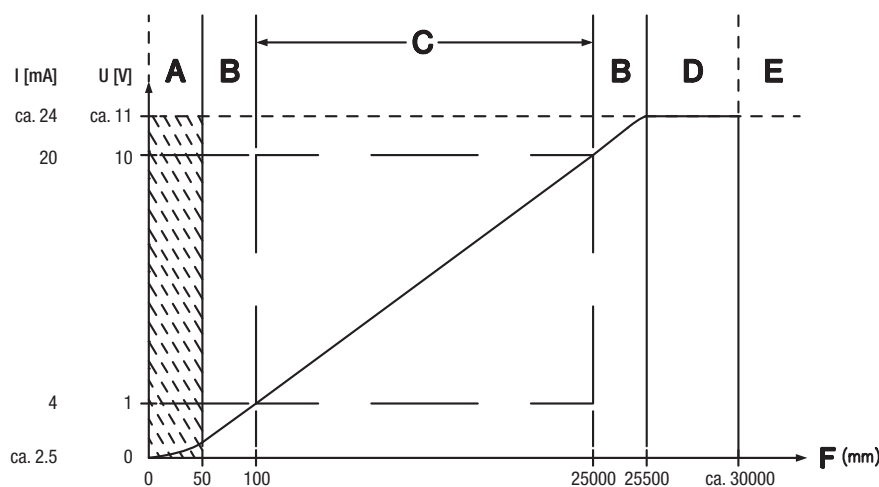


ATTENTION, LASER RADIATION – LASER CLASS 1

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

- ↳ Observe the applicable statutory and local laser protection regulations.
- ↳ 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.

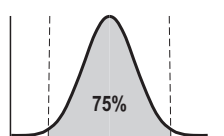
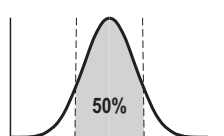
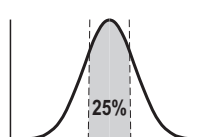
Analog output: characteristic curve for factory setting



Factory setting

- A** Area not defined
- B** Linearity not defined
- C** Measurement range
- D** Object present
- E** No object detected
- F** Measurement distance

Individual measure modes

Measure mode	Adjustable number of measurements for the floating average calculation	Adjustable filter depth	Measurement value formation
Individual	1 ... 300	–	–
Spike suppression	5 ... 300	Raw	Approx. 75% of the measurement values are averaged in the center 
		Medium	Approx. 50% of the measurement values are averaged in the center 
		Fine	Approx. 25% of the measurement values are averaged in the center 

IO-Link process data

Process data format: M-sequence TYPE_2_V

- PDOOut (Master -> Sensor): none
- PDIn (Sensor -> Master): 24-bit (16 measurement value bits, 8 status bits)

Measurement values

16-bit measurement value: distance to the object – between lower and upper limit of the measurement range – in mm.

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
----	----	----	----	----	----	---	---	---	---	---	---	---	---	---	---

Special values:

- Signal=0 (no reception signal): 65535
- Measurement range exceeded: upper limit of the measurement range
- Measurement range below minimum value: lower limit of the measurement range
- Measurement=0 (while teaching or during activation): last measurement value
- Measurement=0 (during start-up): 65535

Status bits

Bit	23	22	21	20	19	18	17	16
Value	0	0	W	S	M	Q3	Q2	Q1

0	Unassigned bits (bit 22 and bit 23) are 0; initialization state is also 0
W	1: running measurement (measurement running) 0: during start-up, teaching, deactivation
S	1: signal OK, reception signal is sufficient for measurement value output
M	1: warning; e.g., weak reception signal
Q1 ... Q3	Switching states Q1, Q2, Q3 1: Active

ODS10

Optical distance sensors

Part number code

ODS10L1-25M.8/LAK,200-M12

Operating principle

ODS Optical distance sensor

Series

10 10 series

Laser class

L1 Laser class 1 (acc. to IEC 60825-1:2007)

Measurement range

25M Extended measurement range 50 ... 25000mm, measurement on HighGain tape
REF 7-A-100x100

Equipment

8 OLED display and membrane keyboard for configuration

Assignment pin 4

L IO-Link (with dual channel, also push/pull switching output)

Assignment pin 2

A Analog output current (factory setting) and voltage

6 Push/pull switching output

Assignment pin 5

K Multifunction input (factory setting: deactivation input)

6 Push/pull switching output

X Do not connect

Electrical connection

-M12 M12 connector, 5-pin

,YYYY Cable, length YYYYmm with wire-end sleeves, 5-wire (not specified = standard length 2000mm)

,200-M12 Cable, length 200mm with M12 connector, 5-pin

Order guide

	Designation	Part no.
Connection: M12 connector, 5-pin IO-Link 1.1, analog output, multifunction input, 1 push/pull switching output	ODS10L1-25M.8/LAK-M12	50129530
Connection: cable, length 2000mm with wire-end sleeves, 5-wire IO-Link 1.1, analog output, multifunction input, 1 push/pull switching output	ODS10L1-25M.8/LAK	50129533
Connection: cable, length 200mm with M12 connector, 5-pin IO-Link 1.1, analog output, multifunction input, 1 push/pull switching output	ODS10L1-25M.8/LAK,200-M12	50129536
Accessories		
HighGain reflective tape, 100mm x 100mm, self-adhesive	REF 7-A-100x100	50111527
Mounting system for mounting on rods Ø 10mm	BTU 460M-D10	50128379
Mounting system for mounting on rods Ø 12mm	BTU 460M-D12	50128380
Connection cable with M12 connector, angled, 5-pin, length 2m, PVC sheathing (many other connection cables are available)	K-D M12W-5P-2m-PVC	50104556
IO-Link master set	SET MD12-US2-IL1.1 + accessories - diagnostics set	50121098