

## Technical data sheet

### Optical distance sensor

Part no.: 50151569

ODS9L1.8/L6X-1050,200-M12



For illustration purposes only

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- Dimensioned drawings
- Electrical connection
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CDRH



## Technical data

### Basic data

|                         |                                                                                       |
|-------------------------|---------------------------------------------------------------------------------------|
| Series                  | 9                                                                                     |
| Application             | Fill-level monitoring<br>Length measurement in material cutting<br>Object measurement |
| Type of scanning system | Against object                                                                        |

### Characteristic parameters

|      |          |
|------|----------|
| MTTF | 36 years |
|------|----------|

### Optical data

|                                      |                        |
|--------------------------------------|------------------------|
| Beam path                            | Collimated             |
| Light source                         | Laser, Red             |
| Wavelength                           | 650 nm                 |
| Laser class                          | 1, IEC/EN 60825-1:2014 |
| Transmitted-signal shape             | Pulsed                 |
| Pulse duration                       | 22,000 µs              |
| Light spot size [at sensor distance] | 1.5 mm [1,050 mm]      |
| Type of light spot geometry          | Round                  |

### Measurement data

|                                        |                                         |
|----------------------------------------|-----------------------------------------|
| Measurement range                      | 50 ... 1,050 mm                         |
| Resolution                             | 0.1 mm                                  |
| Accuracy, distant range                | 2 %                                     |
| Reference value, accuracy              | Measurement distance 200 mm ... 1000 mm |
| Reproducibility (1 sigma)              | 0.2 mm                                  |
| Temperature drift                      | 0.02 %/K                                |
| Referencing                            | No                                      |
| Optical distance measurement principle | Triangulation                           |

### Electrical data

|                    |                                                                                 |
|--------------------|---------------------------------------------------------------------------------|
| Protective circuit | Polarity reversal protection<br>Short circuit protected<br>Transient protection |
|--------------------|---------------------------------------------------------------------------------|

### Performance data

|                      |                        |
|----------------------|------------------------|
| Supply voltage $U_B$ | 18 ... 30 V, DC        |
| Residual ripple      | 0 ... 15 %, From $U_B$ |
| Open-circuit current | 0 ... 50 mA            |

### Outputs

|                                     |            |
|-------------------------------------|------------|
| Number of digital switching outputs | 2 Piece(s) |
| Switching power, max.               | 0.0012 W   |

### Switching outputs

|                   |                                           |
|-------------------|-------------------------------------------|
| Type              | Digital switching output                  |
| Voltage type      | DC                                        |
| Switching voltage | high: $\geq(U_B - 2V)$<br>low: $\leq 2 V$ |

### Switching output 1

|                     |                                                      |
|---------------------|------------------------------------------------------|
| Assignment          | Connection 1, pin 4                                  |
| Switching element   | Transistor, Push-pull                                |
| Switching principle | IO-Link / light switching (PNP)/dark switching (NPN) |

### Switching output 2

|                     |                                            |
|---------------------|--------------------------------------------|
| Assignment          | Connection 1, pin 2                        |
| Switching element   | Transistor, Push-pull                      |
| Switching principle | Light switching (PNP)/dark switching (NPN) |

### Time behavior

|                 |                                                                                                                                |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------|
| Response time   | 8 ms, at a measurement distance of 200 mm and under constant ambient conditions, 90% diffuse reflection, standard measure mode |
| Readiness delay | 300 ms                                                                                                                         |

### Interface

|                  |                      |
|------------------|----------------------|
| Type             | IO-Link              |
| IO-Link          |                      |
| COM mode         | COM3                 |
| Profile          | Smart sensor profile |
| Min. cycle time  | COM3 = 0.5 ms        |
| Frame type       | 2.V                  |
| Port type        | A                    |
| Specification    | V1.1                 |
| Device ID        | 2159                 |
| SIO-mode support | Yes                  |
| Process data IN  | 4 byte               |
| Process data OUT | 8 bit                |
| Dual Channel     | Yes                  |

### Connection

|                       |                                           |
|-----------------------|-------------------------------------------|
| Number of connections | 1 Piece(s)                                |
| Connection 1          |                                           |
| Function              | Signal IN<br>Signal OUT<br>Voltage supply |
| Type of connection    | Cable with connector, Turning, 90°        |
| Cable length          | 200 mm                                    |
| Sheathing material    | PUR                                       |
| Cable color           | Black                                     |
| Wire cross section    | 0.14 mm <sup>2</sup>                      |
| Thread size           | M12                                       |
| Type                  | Male                                      |
| Material              | Plastic                                   |
| No. of pins           | 5 -pin                                    |
| Encoding              | A-coded                                   |

### Mechanical data

|                       |                                                       |
|-----------------------|-------------------------------------------------------|
| Design                | Cubic                                                 |
| Dimension (W x H x L) | 21 mm x 50 mm x 50 mm                                 |
| Housing material      | Plastic                                               |
| Lens cover material   | Glass                                                 |
| Net weight            | 50 g                                                  |
| Housing color         | Red                                                   |
| Type of fastening     | Through-hole mounting<br>Via optional mounting device |

## Technical data

### Operation and display

|                      |                 |
|----------------------|-----------------|
| Type of display      | LED             |
|                      | OLED display    |
| Number of LEDs       | 2 Piece(s)      |
| Operational controls | Control buttons |
|                      | PC software     |

### Environmental data

|                                |                         |
|--------------------------------|-------------------------|
| Ambient temperature, operation | -20 ... 50 °C           |
| Ambient temperature, storage   | -30 ... 70 °C           |
| Ambient light sensitivity      | 20,000 lx, EN 60947-5-2 |

### Certifications

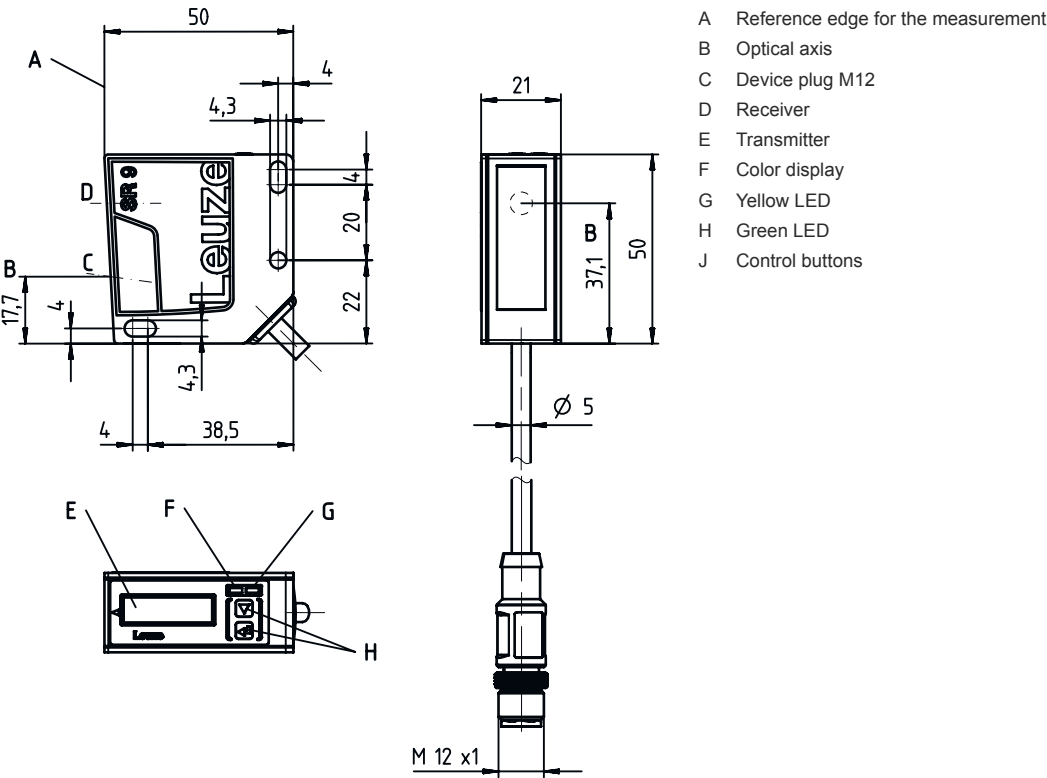
|                      |               |
|----------------------|---------------|
| Degree of protection | IP 67         |
| Protection class     | III           |
| Approvals            | UL            |
| Standards applied    | IEC 60947-5-9 |

### Classification

|                       |          |
|-----------------------|----------|
| Customs tariff number | 90318020 |
| ECLASS 5.1.4          | 27270801 |
| ECLASS 8.0            | 27270801 |
| ECLASS 9.0            | 27270801 |
| ECLASS 10.0           | 27270801 |
| ECLASS 11.0           | 27270801 |
| ECLASS 12.0           | 27270916 |
| ECLASS 13.0           | 27270916 |
| ECLASS 14.0           | 27270916 |
| ECLASS 15.0           | 27270916 |
| ECLASS 16.0           | 27270916 |
| ETIM 5.0              | EC001825 |
| ETIM 6.0              | EC001825 |
| ETIM 7.0              | EC001825 |
| ETIM 8.0              | EC001825 |
| ETIM 9.0              | EC001825 |
| ETIM 10.0             | EC001825 |

Dimensioned drawings

All dimensions in millimeters

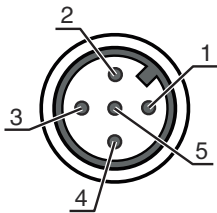


Electrical connection

Connection 1

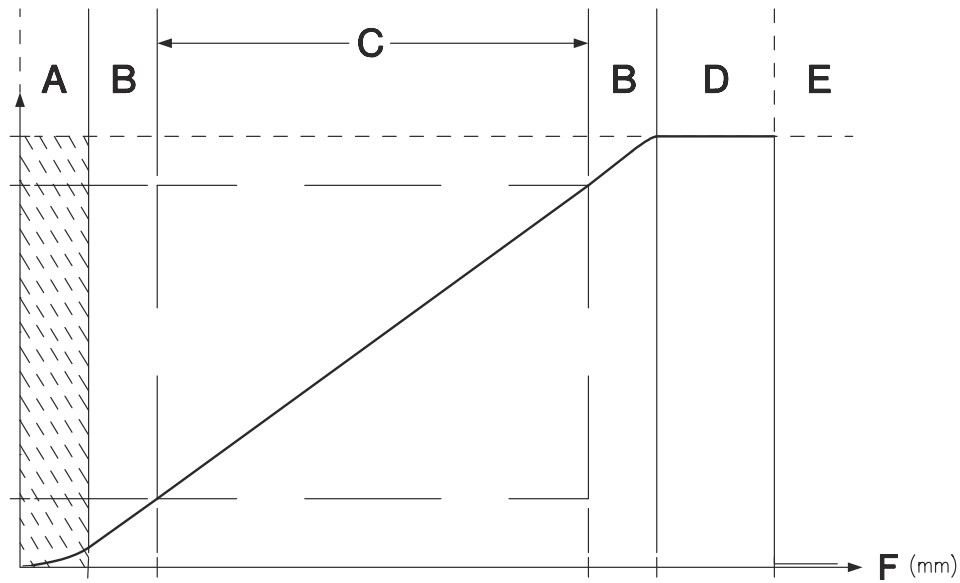
|                    |                      |
|--------------------|----------------------|
| Function           | Signal IN            |
|                    | Signal OUT           |
|                    | Voltage supply       |
| Type of connection | Cable with connector |
| Cable length       | 200 mm               |
| Sheathing material | PUR                  |
| Cable color        | Black                |
| Wire cross section | 0.14 mm²             |
| Thread size        | M12                  |
| Type               | Male                 |
| Material           | Plastic              |
| No. of pins        | 5 -pin               |
| Encoding           | A-coded              |

| Pin | Pin assignment   |
|-----|------------------|
| 1   | 18 ... 30 V DC + |
| 2   | OUT 2            |
| 3   | GND              |
| 4   | IO-Link / OUT 1  |
| 5   | n.c.             |



## Diagrams

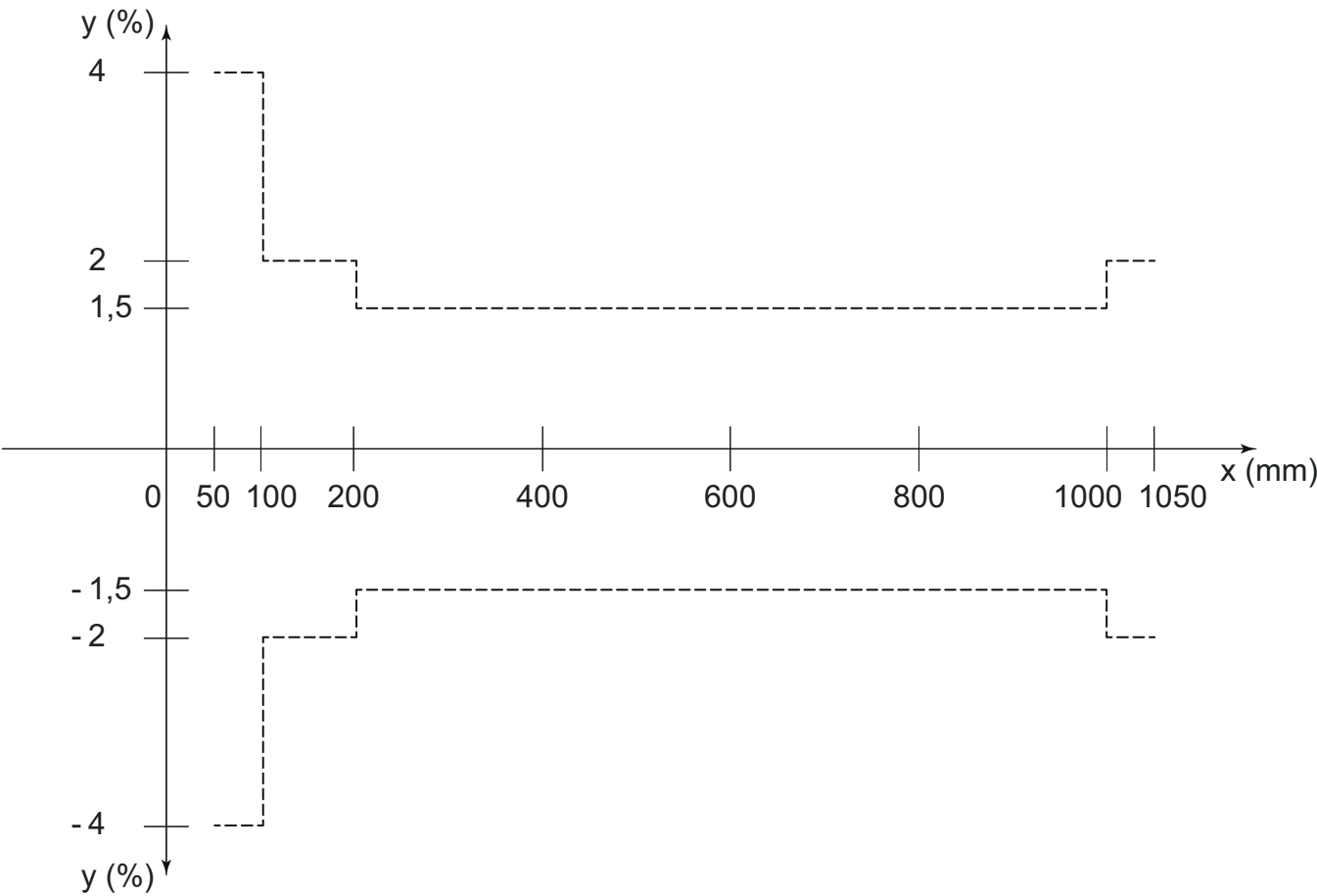
### Characteristic curve of analog output



- |   |                       |   |                                                                           |
|---|-----------------------|---|---------------------------------------------------------------------------|
| A | Area not defined      | E | No object detected (characteristic curve behavior adjustable via IO-Link) |
| B | Linearity not defined | F | Measurement distance                                                      |
| C | Measurement range     |   |                                                                           |
| D | Object detected       |   |                                                                           |

Diagrams

Accuracy of measurement



x Distance [mm]  
y Measurement error in % of measurement value

Operation and display

| LED | Display                  | Meaning                         |
|-----|--------------------------|---------------------------------|
| 1   | Green, continuous light  | Ready                           |
| 2   | Yellow, continuous light | Object in the measurement range |

Part number code

Part designation: ODS9XX.Y/ZAB-CCC-DDD

|      |                                                                                                                                                                     |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ODS9 | <b>Operating principle</b><br>Optical distance sensor of the 9 series                                                                                               |
| XX   | <b>Light source</b><br>L2: laser class 2<br>L1: laser class 1                                                                                                       |
| Y    | <b>Equipment</b><br>8: OLED display and membrane keyboard for configuration                                                                                         |
| Z    | <b>Switching output/function OUT 1/IN: Pin 4 or black conductor</b><br>L: IO-Link                                                                                   |
| A    | <b>Switching output / function OUT 2/IN: pin 2 or white conductor</b><br>A: Analog output<br>6: push-pull switching output, PNP light switching, NPN dark switching |

## Part number code

|            |                                                                                                                                                                                                                        |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>B</b>   | <b>Switching output / function OUT 3/IN: Pin 5</b><br>X: pin not used<br>6: push-pull switching output, PNP light switching, NPN dark switching<br>L: IO-Link / light switching (PNP)/dark switching (NPN)             |
| <b>CCC</b> | <b>Operating range</b><br>100: operating range 50 ... 100 mm<br>200: operating range 50 ... 200 mm<br>450: operating range 50 ... 450 mm<br>650: operating range 50 ... 650 mm<br>1050: operating range 50 ... 1050 mm |
| <b>DDD</b> | <b>Electrical connection</b><br>M12: M12 connector<br>200-M12: Cable, length 200 mm with M12 connector, 5-pin                                                                                                          |

### Note



A list with all available device types can be found on the Leuze website at [www.leuze.com](http://www.leuze.com).

## 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.



### ATTENTION! LASER RADIATION – CLASS 1 LASER PRODUCT



- The device satisfies the requirements of IEC/EN 60825-1:2014 safety regulations for a product of **laser class 1** and complies with 21 CFR 1040.10 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.
- ⚠ 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.

## Accessories

### Connection technology - Connection cables

|                                                                                     | Part no. | Designation        | Article          | Description                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------|----------|--------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50133855 | KD S-M12-5A-V1-020 | Connection cable | Application: Chemical resistant<br>Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 2,000 mm<br>Sheathing material: PVC |

## Accessories

|                                                                                   | Part no. | Designation        | Article          | Description                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------|----------|--------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50133856 | KD S-M12-5A-V1-050 | Connection cable | Application: Chemical resistant<br>Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 5,000 mm<br>Sheathing material: PVC |
|                                                                                   | 50132077 | KD U-M12-5A-V1-020 | Connection cable | Application: Chemical resistant<br>Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 2,000 mm<br>Sheathing material: PVC  |
|                                                                                   | 50132079 | KD U-M12-5A-V1-050 | Connection cable | Application: Chemical resistant<br>Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: PVC  |

## Mounting technology - Mounting brackets

|                                                                                     | Part no. | Designation | Article          | Description                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------|----------|-------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50118543 | BT 300M.5   | Mounting bracket | Design of mounting device: Angle, L-shape<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Screw type, Suited for M4 screws<br>Type of mounting device: Adjustable<br>Material: Stainless steel |

## Mounting technology - Rod mounts

|                                                                                     | Part no. | Designation  | Article         | Description                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|----------|--------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50117252 | BTU 300M-D12 | Mounting system | Contains: 2x M4 x 25 screw, 2x M4 x 20 screw, 4x position washers<br>Design of mounting device: Mounting system<br>Fastening, at system: For 12 mm rod, Sheet-metal mounting<br>Mounting bracket, at device: Screw type, Suited for M4 screws<br>Type of mounting device: Clampable, Adjustable, Turning, 360°<br>Material: Metal |
|  | 50128380 | BTU 460M-D12 | Mounting system | Design of mounting device: Mounting system<br>Fastening, at system: For 12 mm rod<br>Mounting bracket, at device: Screw type<br>Type of mounting device: Adjustable, Turning, 360°<br>Material: Metal                                                                                                                             |

Accessories

Configuration devices

|                                                                                  | Part no. | Designation                  | Article         | Description                                                                                    |
|----------------------------------------------------------------------------------|----------|------------------------------|-----------------|------------------------------------------------------------------------------------------------|
|  | 50121098 | SET MD12-US2-IL1.1<br>+ Zub. | Diagnostics set | Supply voltage: DC<br>Interface: USB<br>Connections: 2 Piece(s)<br>Degree of protection: IP 20 |

Note



A list with all available accessories can be found on the Leuze website in the Download tab of the article detailed page.