

## Technical data sheet

### Optical distance sensor

Part no.: 50138066

### ODS110L1.3/LTX-M12



For illustration purposes only

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CDRH



## Technical data

### Basic data

|                         |                                                                                                                |
|-------------------------|----------------------------------------------------------------------------------------------------------------|
| Series                  | 110                                                                                                            |
| Application             | Collision protection for transport vehicles<br>Fill-level monitoring<br>Length measurement in material cutting |
| Type of scanning system | Against object                                                                                                 |

### Optical data

|                                      |                          |
|--------------------------------------|--------------------------|
| Beam path                            | Collimated               |
| Light source                         | Laser, Red               |
| Wavelength                           | 655 nm                   |
| Laser class                          | 1, IEC/EN 60825-1:2007   |
| Transmitted-signal shape             | Pulsed                   |
| Light spot size [at sensor distance] | 5.5 mm x 7 mm [5,000 mm] |
| Type of light spot geometry          | Oval                     |

### Measurement data

|                                                   |                         |
|---------------------------------------------------|-------------------------|
| Measurement range (6 ... 90 % diffuse reflection) | 60 ... 3,000 mm         |
| Measurement range (90 % diffuse reflection)       | 60 ... 5,000 mm         |
| Resolution                                        | 1.0 mm                  |
| Reproducibility (1 sigma)                         | , see diagram           |
| Temperature drift                                 | 2 mm/K                  |
| Standard measurement object                       | 50 x 50 mm <sup>2</sup> |
| Optical distance measurement principle            | Time of flight          |
| Linearity error                                   | 30 mm                   |

### Electrical data

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

#### Performance data

|                      |                 |
|----------------------|-----------------|
| Supply voltage $U_B$ | 18 ... 30 V, DC |
| Open-circuit current | 60 mA           |

#### Inputs

|                        |            |
|------------------------|------------|
| Number of teach inputs | 1 Piece(s) |
|------------------------|------------|

#### Teach inputs

|                   |              |
|-------------------|--------------|
| Voltage type      | DC           |
| Switching voltage | high: $+U_B$ |

#### Teach input 1

|            |                     |
|------------|---------------------|
| Assignment | Connection 1, pin 2 |
|------------|---------------------|

#### Outputs

|                                     |                                                                |
|-------------------------------------|----------------------------------------------------------------|
| Number of digital switching outputs | 1 Piece(s)                                                     |
| IO-Link note                        | Two switching outputs via IO-Link process data (SSC 1 & SSC 2) |

#### Switching outputs

|              |                          |
|--------------|--------------------------|
| Type         | Digital switching output |
| Voltage type | DC                       |

#### Switching output 1

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

### Time behavior

|               |                                                           |
|---------------|-----------------------------------------------------------|
| Response time | 20 ms, Axial object approach / 4 ms, lateral object entry |
|---------------|-----------------------------------------------------------|

### Interface

|      |         |
|------|---------|
| Type | IO-Link |
|------|---------|

#### IO-Link

|                      |                |
|----------------------|----------------|
| COM mode             | COM2           |
| Profile              | Common Profile |
| Min. cycle time      | COM2 = 2.7 ms  |
| Frame type           | 2.2            |
| Port type            | A              |
| Specification        | V1.1           |
| Device ID            | 0x00087E       |
| SIO-mode support     | Yes            |
| Process data, length | 24 bit         |

### Connection

|                       |            |
|-----------------------|------------|
| Number of connections | 1 Piece(s) |
|-----------------------|------------|

#### Connection 1

|                    |                                           |
|--------------------|-------------------------------------------|
| Function           | Signal IN<br>Signal OUT<br>Voltage supply |
| Type of connection | Connector, Turning, 90°                   |
| Thread size        | M12                                       |
| Type               | Male                                      |
| Material           | Plastic                                   |
| No. of pins        | 4 -pin                                    |
| Encoding           | A-coded                                   |

### Mechanical data

|                       |                                                       |
|-----------------------|-------------------------------------------------------|
| Design                | Cubic                                                 |
| Dimension (W x H x L) | 23 mm x 50 mm x 50 mm                                 |
| Housing material      | Plastic                                               |
| Plastic housing       | ABS                                                   |
| Lens cover material   | Plastic / PMMA                                        |
| Net weight            | 42 g                                                  |
| Housing color         | Red                                                   |
| Type of fastening     | Through-hole mounting<br>Via optional mounting device |

### Operation and display

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

### Environmental data

|                                   |                                 |
|-----------------------------------|---------------------------------|
| Ambient temperature, operation    | -40 ... 50 °C, UL: max. + 45 °C |
| Ambient temperature, storage      | -40 ... 80 °C                   |
| Extraneous light protection, max. | 5,000 lx                        |

### Certifications

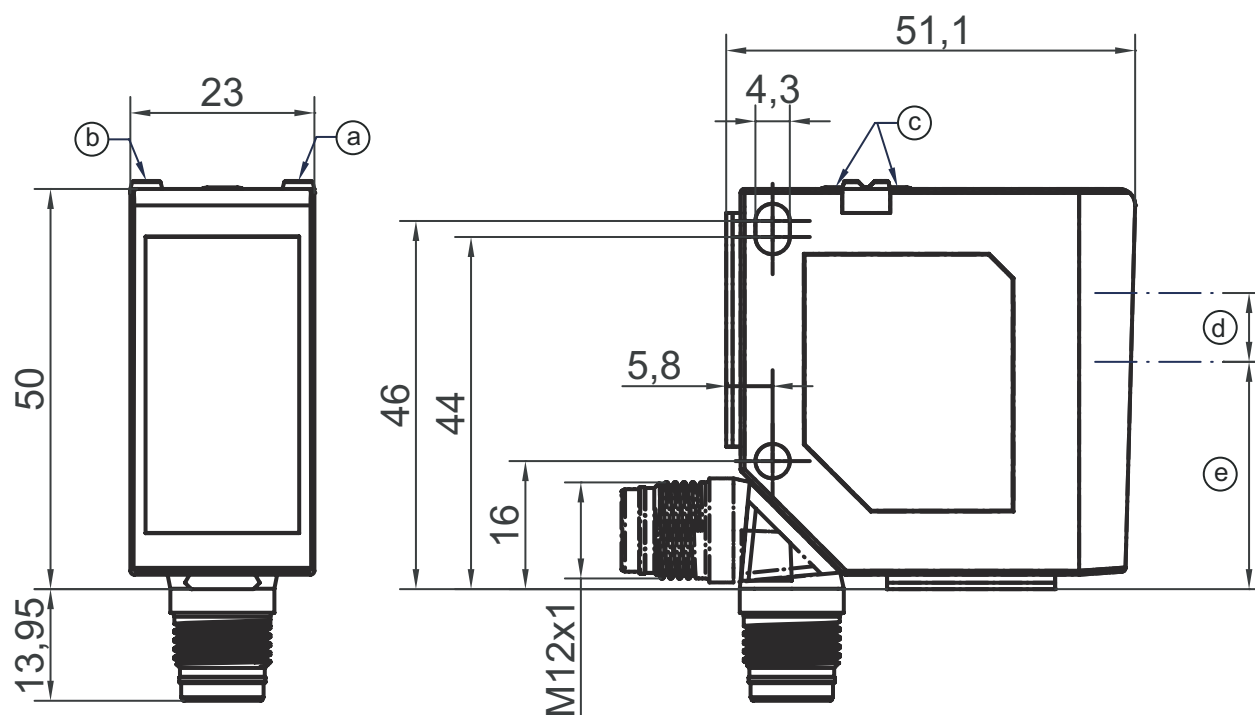
|                      |                  |
|----------------------|------------------|
| Degree of protection | IP 67<br>IP 69K  |
| Protection class     | III              |
| Approvals            | c UL US          |
| Standards applied    | IEC/EN 60947-5-2 |

## Technical data

|                       |          |
|-----------------------|----------|
| Customs tariff number | 90318080 |
| 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



- a Yellow LED
- b Green LED
- c Control buttons
- d Transmitter
- e Receiver

## Electrical connection

### Connection 1

|                    |                |
|--------------------|----------------|
| Function           | Signal IN      |
|                    | Signal OUT     |
|                    | Voltage supply |
| Type of connection | Connector      |
| Thread size        | M12            |
| Type               | Male           |
| Material           | Plastic        |
| No. of pins        | 4 -pin         |
| Encoding           | A-coded        |

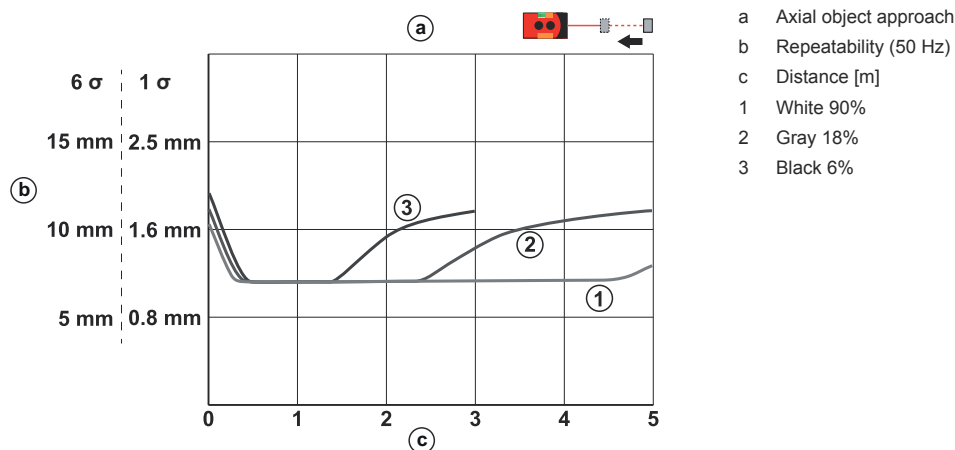
### Pin Pin assignment

|   |                  |
|---|------------------|
| 1 | 18 ... 30 V DC + |
| 2 | Teach-in         |
| 3 | GND              |
| 4 | IO-Link / OUT 1  |

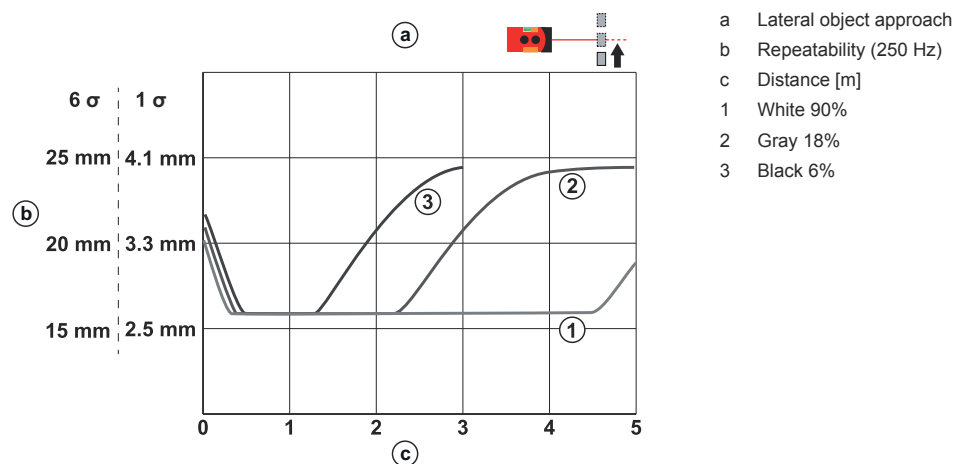


## Diagrams

### Repeatability (50 Hz)



### Repeatability (250 Hz)



## Operation and display

| LED | Display                  | Meaning                          |
|-----|--------------------------|----------------------------------|
| 1   | Yellow, continuous light | Switching output/switching state |
| 2   | Green, continuous light  | Operating voltage applied        |
|     | Yellow, continuous light | Analog output status display     |

## Part number code

Part designation: **XXX110YY.Z/ABC-DDD**

|               |                                                                                                                                                                                                          |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>XXX110</b> | <b>Operating principle</b><br>ODS110: Optical distance sensor<br>HT110: diffuse reflection sensor with background suppression                                                                            |
| <b>YY</b>     | <b>Light source</b><br>L1: laser class 1                                                                                                                                                                 |
| <b>Z</b>      | <b>Equipment</b><br>3: Control buttons for configuration                                                                                                                                                 |
| <b>A</b>      | <b>Switching output/function OUT 1/IN: Pin 4 or black conductor</b><br>L: IO-Link                                                                                                                        |
| <b>B</b>      | <b>Switching output / function OUT 2/IN: pin 2 or white conductor</b><br>6: push-pull switching output, PNP light switching, NPN dark switching<br>C: Current output<br>T: teach-in<br>V: Voltage output |
| <b>C</b>      | <b>Switching output / function OUT 3/IN: Pin 5</b><br>X: pin not used<br>T: teach-in                                                                                                                     |
| <b>DDD</b>    | <b>Electrical connection</b><br>M12: M12 connector                                                                                                                                                       |

### 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



- Observe the applicable statutory and local laser protection regulations.

## Notes



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



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.

## Further information

- Ambient temperature, operation: UL: max. +45°
- Warmup time: minimum 20 min at +24 VDC and an ambient temperature of 20 °C
- Response time: depending on the entry direction of the object to be measured

## Accessories

### Connection technology - Connection unit

|                                                                                    | Part no. | Designation           | Article        | Description                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------|----------|-----------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50144900 | MD 798i-11-82/L5-2222 | IO-Link master | Current consumption, max.: 11,000 mA<br>Interface: IO-Link, Automatic protocol detection, EtherNet IP, Modbus TCP, PROFINET<br>Connections: 12 Piece(s)<br>Sensor connections: 8 Piece(s)<br>Degree of protection: IP 67, IP 65, IP 69K |

### Connection technology - Connection cables

|                                                                                     | Part no. | Designation        | Article          | Description                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------|----------|--------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50130654 | KD U-M12-4A-P1-020 | Connection cable | Application: Oil and lubricant resistant<br>Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 2,000 mm<br>Sheathing material: PUR |
|                                                                                     | 50130657 | KD U-M12-4A-P1-050 | Connection cable | Application: Oil and lubricant resistant<br>Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: PUR |
|                                                                                     | 50130648 | KD U-M12-4A-V1-020 | Connection cable | Application: Chemical resistant<br>Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 2,000 mm<br>Sheathing material: PVC          |

## Accessories

|                                                                                   | Part no. | Designation        | Article          | Description                                                                                                                                                                                                          |
|-----------------------------------------------------------------------------------|----------|--------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50130652 | KD U-M12-4A-V1-050 | Connection cable | Application: Chemical resistant<br>Connection 1: Connector, M12, Axial, Female, A-coded, 4 -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 |

### Note



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