

# Technical data sheet

## Ultrasonic distance sensor

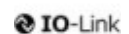
Part no.: 50150585  
DMU412B-500/LVT-M12



For illustration purposes only

### Contents

- Technical data
- Dimensioned drawings
- Electrical connection
- Diagrams
- Operation and display
- Part number code
- Notes
- Accessories



## Technical data

### Basic data

|          |                     |
|----------|---------------------|
| Series   | 412B                |
| Contains | 2x M12 mounting nut |

### Special version

|                 |                       |
|-----------------|-----------------------|
| Special version | Multiplex operation   |
|                 | Synchronous operation |
|                 | Teach input           |

### Characteristic parameters

|      |           |
|------|-----------|
| MTTF | 342 years |
|------|-----------|

### Ultrasonic specifications

|                      |            |
|----------------------|------------|
| Ultrasonic frequency | 290 kHz    |
| Direction of beam    | Front      |
| Opening angle        | 3 ... 11 ° |

### Measurement data

|                                    |                     |
|------------------------------------|---------------------|
| Measurement range                  | 15 ... 500 mm       |
| Resolution                         | < 0.3 mm / < 0.5 mm |
| Accuracy                           | 2 %                 |
| Reference value, accuracy          | End value           |
| Repeatability                      | 0.5 mm, End value   |
| Temperature drift                  | 2 %                 |
| Reference value, temperature drift | End value           |

### Electrical data

|                    |                              |
|--------------------|------------------------------|
| Protective circuit | Inductive protection         |
|                    | Polarity reversal protection |
|                    | Short circuit protected      |

### Performance data

|                      |                        |
|----------------------|------------------------|
| Supply voltage $U_B$ | 12 ... 30 V, DC        |
| Residual ripple      | 0 ... 10 %, From $U_B$ |
| Open-circuit current | 0 ... 35 mA            |
| Switching hysteresis | 4 %                    |

### Inputs

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

### Teach inputs

|                   |                  |
|-------------------|------------------|
| Switching voltage | high: $\geq 12V$ |
|                   | low: $\leq 2 V$  |
| Input resistance  | 110,000 $\Omega$ |

### Teach input 1

|                        |      |
|------------------------|------|
| Active switching state | High |
|------------------------|------|

### Outputs

|                                     |                   |
|-------------------------------------|-------------------|
| Number of analog outputs            | 1 Piece(s)        |
| Number of digital switching outputs | 1 Piece(s)        |
| Load resistance                     | > 10,000 $\Omega$ |

### Analog outputs

|         |            |
|---------|------------|
| Voltage | 0 ... 10 V |
|---------|------------|

### Analog output 1

|      |         |
|------|---------|
| Type | Voltage |
|------|---------|

### Switching outputs

|                         |                 |
|-------------------------|-----------------|
| Voltage type            | DC              |
| Switching current, max. | 100 mA          |
| Switching voltage       | low: $\leq 2 V$ |

### Switching output 1

|                     |                                                      |
|---------------------|------------------------------------------------------|
| Switching element   | Transistor, Push-pull                                |
| Switching principle | IO-Link / light switching (PNP)/dark switching (NPN) |

### Time behavior

|                     |         |
|---------------------|---------|
| Switching frequency | 12 Hz   |
| Response time       | < 40 ms |
| Readiness delay     | 300 ms  |

### Interface

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

### IO-Link

|                      |             |
|----------------------|-------------|
| COM mode             | COM2        |
| Min. cycle time      | COM2 = 8 ms |
| Frame type           | 2.2         |
| Specification        | V1.1        |
| Device ID            | 3103        |
| SIO-mode support     | Yes         |
| Process data, length | 48 bit      |

### Connection

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

### Connection 1

|                    |                |
|--------------------|----------------|
| Function           | Signal IN      |
|                    | Signal OUT     |
|                    | Teach input    |
|                    | Voltage supply |
| Type of connection | Connector      |
| Thread size        | M12            |
| Type               | Male           |
| Material           | Metal          |
| No. of pins        | 5 -pin         |
| Encoding           | A-coded        |

### Mechanical data

|                                      |                                                        |
|--------------------------------------|--------------------------------------------------------|
| Design                               | Cylindrical                                            |
| Dimension ( $\varnothing \times L$ ) | 12 mm x 50 mm                                          |
| Thread size                          | M12 x 1 mm                                             |
| Housing material                     | Metal                                                  |
| Metal housing                        | Nickel-plated brass                                    |
| Ultrasonic transducer material       | Piezoceramics (contains lead zirconium titanate (PZT)) |
| Net weight                           | 32 g                                                   |
| Housing color                        | Silver                                                 |

### Operation and display

|                 |            |
|-----------------|------------|
| Type of display | LED        |
| Number of LEDs  | 2 Piece(s) |

### Environmental data

|                                |               |
|--------------------------------|---------------|
| Ambient temperature, operation | -25 ... 65 °C |
| Ambient temperature, storage   | -40 ... 75 °C |

Technical data

Certifications

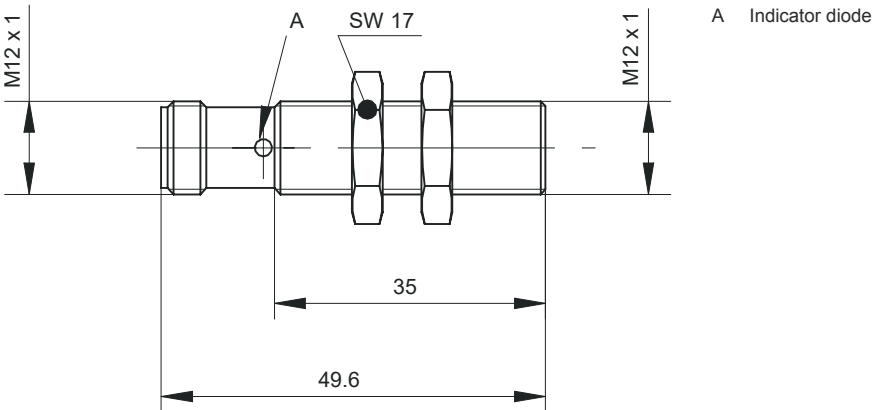
|                      |               |
|----------------------|---------------|
| Degree of protection | IP 67         |
| Protection class     | III           |
| Approvals            | c UL US       |
| Standards applied    | IEC 60947-5-2 |

Classification

|                       |          |
|-----------------------|----------|
| Customs tariff number | 85365019 |
| ECLASS 5.1.4          | 27272803 |
| ECLASS 8.0            | 27272803 |
| ECLASS 9.0            | 27272803 |
| ECLASS 10.0           | 27272803 |
| ECLASS 11.0           | 27272803 |
| ECLASS 12.0           | 27272803 |
| ECLASS 13.0           | 27272803 |
| ECLASS 14.0           | 27272803 |
| ECLASS 15.0           | 27272803 |
| ETIM 5.0              | EC001849 |
| ETIM 6.0              | EC001849 |
| ETIM 7.0              | EC001849 |
| ETIM 8.0              | EC001849 |
| ETIM 9.0              | EC001849 |
| ETIM 10.0             | EC001849 |

Dimensioned drawings

All dimensions in millimeters



Electrical connection

Connection 1

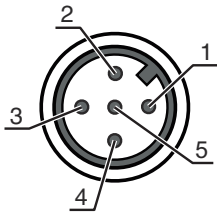
|          |                |
|----------|----------------|
| Function | Signal IN      |
|          | Signal OUT     |
|          | Teach input    |
|          | Voltage supply |

Electrical connection

Connection 1

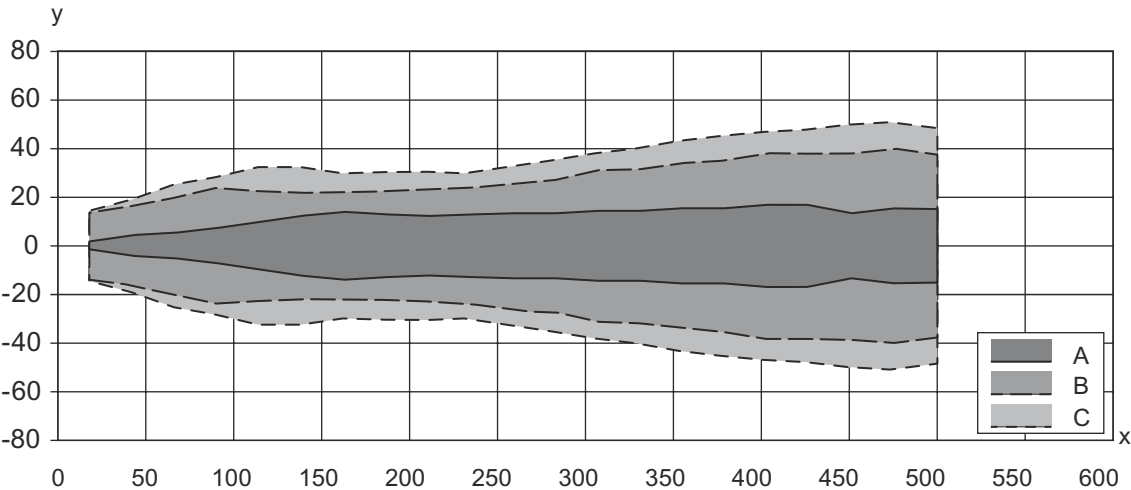
|                    |           |
|--------------------|-----------|
| Type of connection | Connector |
| Thread size        | M12       |
| Type               | Male      |
| Material           | Metal     |
| No. of pins        | 5 -pin    |
| Encoding           | A-coded   |

| Pin | Pin assignment  |
|-----|-----------------|
| 1   | V+              |
| 2   | OUT V           |
| 3   | GND             |
| 4   | IO-Link / OUT 1 |
| 5   | Teach-in        |



Diagrams

Typ. response behavior  
Standard object, size 30 x 30 mm, aligned perpendicular to the sensor reference axis



- x Object distance to the sensor [mm]
- y Lateral offset to the reference axis [mm]
- A Narrow
- B Medium
- C Wide

Operation and display

| LED | Display                  | Meaning               |
|-----|--------------------------|-----------------------|
| 1   | Green, continuous light  | Operational readiness |
| 2   | Yellow, continuous light | Object detected       |

Part number code

Part designation: AAA4BB-xxxx.C/DEF-GG

|      |                                                                                                                                                                                                                                                                   |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AAA  | <b>Operating principle</b><br>HTU: Ultrasonic sensor, scanning principle, with background suppression<br>DMU: Ultrasonic sensor, distance measurement                                                                                                             |
| 4BB  | <b>Design</b><br>420B: Cubic<br>412B: Cylindrical with M12 thread                                                                                                                                                                                                 |
| xxxx | <b>Operating range</b><br>Operating range in millimeters                                                                                                                                                                                                          |
| C    | <b>Operating range adjustment</b><br>3: teach-in via button                                                                                                                                                                                                       |
| D    | <b>Switching output / function OUT 1/IN: Pin 4</b><br>6: push-pull switching output, PNP light switching, NPN dark switching<br>G: Push-pull switching output, PNP dark switching, NPN light switching<br>L: IO-Link / light switching (PNP)/dark switching (NPN) |
| E    | <b>Switching output / function OUT 2/IN: pin 2</b><br>T: teach-in via cable<br>C: Analog current output<br>V: Analog voltage output<br>X: pin not used<br>6: push-pull switching output, PNP light switching, NPN dark switching                                  |
| F    | <b>Switching output / function OUT 3/IN: Pin 5</b><br>T: teach-in via cable                                                                                                                                                                                       |
| GG   | <b>Electrical connection</b><br>M12: M12 connector<br>M8: M8 connector                                                                                                                                                                                            |

| Note                                                                              |                                                                                                                                  |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
|  | ↗ A list with all available device types can be found on the Leuze website at <a href="http://www.leuze.com">www.leuze.com</a> . |

Notes

|  Observe intended use! |                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         | ↗ This product is not a safety sensor and is not intended as personnel protection.<br>↗ The product may only be put into operation by competent persons.<br>↗ Only use the product in accordance with its intended use. |

Accessories

Connection technology - Connection cables

|                                                                                     | Part no. | Designation        | Article          | Description                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|----------|--------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50132079 | KD U-M12-5A-V1-050 | Connection cable | 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 |

## Accessories

|                                                                                  | Part no. | Designation        | Article          | Description                                                                                                                                                                        |
|----------------------------------------------------------------------------------|----------|--------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50133802 | KD U-M12-5W-V1-050 | Connection cable | Connection 1: Connector, M12, Angled, 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                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------|----------|-------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50113549 | BT D12M.5   | Mounting bracket | Diameter, inner: 12 mm<br>Design of mounting device: Angle, L-shape<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Screw type<br>Type of mounting device: Rigid<br>Material: Stainless steel |

## Mounting technology - Rod mounts

|                                                                                    | Part no. | Designation | Article | Description                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------|----------|-------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50111499 | MC 012K     | Clamp   | Diameter, inner: 12 mm<br>Design of mounting device: Mounting clamp<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Rigid<br>Material: Plastic |

### Note



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