Model number
VDM28-8-L-IO/73c/110/122
Distance sensor with 4-pin, M12 x 1 connector

Features
- Operates reliably with Pulse Ranging Technology (PRT)
- Red laser as the light emitter
- Analogue output 0/4 mA ... 20 mA
- Smallest device with PRT for applications as measuring sensor
- High reproducibility irrespective of the surface
- Minimal black-white difference
- IO-link interface for service and process data
- Not sensitive to ambient light, even with energy saving lamps

Description
The VDM28 distance measurement device employs Pulse Ranging Technology (PRT). It has a repeat accuracy of 5 mm with an operating range of 0.2 ... 8 m and an absolute accuracy of 25 mm. The sensor is highly resistant to ambient conditions. The compact housing of the Series 28 photoelectric sensors, with dimensions of 88 mm (height), 26 mm (width) and 54 mm (depth), make it the smallest device available in its class.
### Technical data

#### General specifications
- **Light source**: Laser diode red, 660 nm
- **Angle deviation**: Max. ± 2°
- **Approvals**: CE
- **Laser class**: 2
- **Measuring method**: Pulse Ranging Technology (PRT)
- **Measuring range**: 0.2 ... 8 m
- **Reference target**: Kodak white (90%)
- **Light type**: Red, modulated light
- **Diameter of the light spot**: < 10 mm at a distance of 8 m at 20 °C (293 K)
- **Ambient light limit**: 50000 Lux
- **Temperature influence**: typ. ± 0.25 mm/K

#### Indicators/operating means
- **Operating display**: LED green
- **Function display**: 2 LEDs yellow for switching state
- **Teach-In indication**: Teach-In: LED yellow/green; equiphase flashing, 2.5 Hz; Teach Error: LED green/yellow non equiphase flashing; 8.0 Hz
- **Operating elements**: 5-step rotary switch for operating modes selection (threshold setting and operating modes)

#### Electrical specifications
- **Operating voltage**: U_B 10 ... 30 V DC / when operating in IO link mode: 18 ... 30 V
- **Protection class**: Ii, rated voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1
- **Ripple**: 10 % within the supply tolerance
- **No-load supply current**: I_0 ≤ 70 mA / 24 V DC

#### Interface
- **Interface type**: IO-Link
- **Protocol**: IO link V1.0
- **Cycle time**: min. 2.3 ms
- **Mode**: COM 2 (38.4 kbit)
- **Process data width**: 16 Bit
- **SIO mode support**: yes

#### Output
- **Signal output**: Push-pull output, short-circuit proof, protected against reverse polarity
- **Switching voltage**: max. 30 V DC
- **Switching current**: max. 100 mA
- **Measurement output**: 1 analogue output 4 ... 20 mA, short-circuit/overload protected
- **Switching frequency**: f 50 Hz
- **Response time**: 10 ms

#### Performance characteristics
- **Absolute accuracy**: ± 25 mm
- **Repeatability**: < 5 mm

#### Standard conformity
- **Standards**: EN 60947-5-2

#### Ambient conditions
- **Ambient temperature**: -30 ... 50 °C (243 ... 323 K)
- **Storage temperature**: -30 ... 70 °C (243 ... 343 K)

#### Mechanical specifications
- **Protection degree**: IP65
- **Connection**: connector M12 x 1, 4-pin
- **Material**: Housing Plastic ABS, Optical face Plastic pane
- **Mass**: 90 g

### Accessories
- **IO-Link-Master-USB DTM**
- **OMH-05** Mounting aid
- **OMH-07** Mounting aid
- **OMH-21** Mounting aid
- **OMH-22** Mounting aid
- **OMH-MLV11-K** Mounting aid
- **OMH-RLK29** Mounting aid
- **OMH-RLK29-HW** Mounting aid
- **OMH-RL28-C** Mounting aid
- **IO-Link-Master01-USB**
- **IO-Link Master**
- **OMH-K01** Mounting aid
- **OMH-K03** Mounting aid

**VDM28-IO-Link DTM DTM collection**

Additional accessories can be found in the Internet.
Teach-in
With the rotary switch, you can select output Q1 and the relevant switching threshold A and/or B. The yellow LEDs indicate the current state of the selected output.
To store the switching threshold (distance value) press the "SET" button until the LEDs flash in phase (approx. 2 s). Teach-in starts when the "SET" button is released. Successful teach-in is indicated by alternating flashing (2.5 Hz) of the yellow and green LEDs. Unsuccessful teach-in is indicated by alternating flashing (8 Hz).
After successful teach-in, the output and LED change their status. After unsuccessful teach-in, the sensor continues to operate with the previous valid setting after the relevant error message is issued.
This procedure can be repeated for all switching points.
Different switching modes can be selected by choosing different switching points.
Every taught-in value can be re-taught (overwritten) by pressing the SET button again.
By pressing the "SET" button for > 5 s, the taught-in value is deleted. This procedure is indicated when the LEDs go out simultaneously.
The teach-in of the minimum and maximum value for the analog output Q2 is set in the same way as the switching output:
For: A = 4 mA
B = 20 mA
With this three different modes are achieved:
A < B -> rising slope
**A > B -> falling slope**

![Graph showing a falling slope](image)

**A leer -> zero point straight**

![Graph showing a zero point straight](image)

**Default setting analog output Q2**

- A = 200 mm
- B = 5000 mm

It is not possible to delete value B.

By deleting value A you reach mode „zero point straight“

**Reset to default settings**

- Set the rotary switch to the “RUN” position.
- Press the “SET” button until the in-phase flashing of the LEDs stops (approx. 10 s)
- If the green LED lights up, the procedure is complete.

**Error messages**

- **Short circuit**
  - In the event of a short circuit, the green LED flashes with a frequency of approx. 4 Hz.
- **Teach error**
  - In the event of a teach error, both LEDs flash alternately with a frequency of approx. 8 Hz.
Model number

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with 4-pin, M12 x 1 connector

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- IO-link interface for service and process data
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Description

The VDM28 distance measurement device employs Pulse Ranging Technology (PRT). It has a repeat accuracy of 5 mm with an operating range of 0.2 … 8 m and an absolute accuracy of 25 mm. The sensor is highly resistant to ambient conditions. The compact housing of the Series 28 photoelectric sensors, with dimensions of 88 mm (height), 26 mm (width) and 54 mm (depth), make it the smallest device available in its class.

Electrical connection

Option:

1. +UB
2. Q2 analog
3. 0 V
4. Q1

○ = Light on
● = Dark on

Pinout

Indicators/operating means

1. Operating display  green
2. Signal display  yellow
3. TEACH-IN button
4. Mode rotary switch
5. Optical axis emitter
## Technical data

### General specifications
- **Light source**: Laser diode red, 660 nm, typ. service life 85,000 h at Ta = +25 °C
- **Angle deviation**: max. ± 2°
- **Approvals**: CE
- **Laser class**: 2
- **Measuring method**: Pulse Ranging Technology (PRT)
- **Measuring range**: 0.2 ... 8 m
- **Reference target**: Kodak white (90%)
- **Light type**: Red, modulated light
- **Diameter of the light spot**: < 10 mm at a distance of 8 m at 20 °C (293 K)
- **Ambient light limit**: 50 000 Lux
- **Temperature influence**: typ. ± 0.25 mm/K

### Indicators/operating means
- **Operating display**: LED green
- **Function display**: 2 LEDs yellow for switching state
- **Teach-In indication**: Teach-In: LED yellow/green; equiphase flashing, 2.5 Hz
  Teach Error: LED green/yellow non equiphase flashing; 8.0 Hz
- **Operating elements**: 5-step rotary switch for operating modes selection (threshold setting and operating modes)
- **Operating elements**: Switch for setting the threshold values

### Electrical specifications
- **Operating voltage**: \( U_B \): 10 ... 30 V DC / when operating in IO link mode: 18 ... 30 V
- **Protection class**: II, rated voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1
- **Ripple**: 10 % within the supply tolerance
- **No-load supply current**: \( I_0 \) ≤ 70 mA / 24 V DC
- **Interface type**: IO-Link
- **Protocol**: IO link V1.0
- **Cycle time**: min. 2.3 ms
- **Mode**: COM 2 (38.4 kBaud)
- **Process data width**: 16 Bit
- **SIO mode support**: yes
- **Output**: Push-pull output, short-circuit proof, protected against reverse polarity
- **Switching voltage**: max. 30 V DC
- **Switching current**: max. 100 mA
- **Measurement output**: 1 analogue output 4 ... 20 mA, short-circuit/overload protected
- **Switching frequency**: \( f \) 50 Hz
- **Response time**: 10 ms

### Performance characteristics
- **Absolute accuracy**: ± 25 mm
- **Repeat accuracy**: < 5 mm

### Standard conformity
- **Standards**: EN 60947-5-2

### Ambient conditions
- **Ambient temperature**: -30 ... 50 °C (243 ... 323 K)
- **Storage temperature**: -30 ... 70 °C (243 ... 343 K)

### Mechanical specifications
- **Protection degree**: IP65
- **Connection**: connector M12 x 1, 4-pin
- **Material**: Housing: Plastic ABS
- **Optical face**: Plastic pane
- **Mass**: 90 g

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Additional accessories can be found in the Internet.
Curves / diagrams

### Measuring range

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**Subject to modifications without notice**

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### Adjustment

#### Teach-in

With the rotary switch, you can select output Q1 and the relevant switching threshold A and/or B.

The yellow LEDs indicate the current state of the selected output.

To store the switching threshold (distance value) press the "SET" button until the LEDs flash in phase (approx. 2 s). Teach-in starts when the "SET" button is released.

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Unsuccessful teach-in is indicated by alternating flashing (8 Hz).

After successful teach-in, the output and LED change their status.

After unsuccessful teach-in, the sensor continues to operate with the previous valid setting after the relevant error message is issued.

This procedure can be repeated for all switching points.

Different switching modes can be selected by choosing different switching points.

**Example Diagrams**

- **A > B**
  - **B > A**

Every taught-in value can be re-taught (overwritten) by pressing the SET button again.

By pressing the "SET" button for > 5 s, the taught-in value is deleted. This procedure is indicated when the LEDs go out simultaneously.

The teach-in of the minimum and maximum value for the analog output Q2 is set in the same way as the switching output:

For: A = 4 mA
B = 20 mA

With this three different modes are achieved:

**A < B -> rising slope**
**Distance sensor**

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A = 200 mm  
B = 5000 mm

- It is not possible to delete value B.  
- By deleting value A you reach mode „zero point straight“

**Reset to default settings**

- Set the rotary switch to the “RUN” position.  
- Press the “SET” button until the in-phase flashing of the LEDs stops (approx. 10 s)  
- If the green LED lights up, the procedure is complete.

**Error messages**

- Short circuit: In the event of a short circuit, the green LED flashes with a frequency of approx. 4 Hz.  
- Teach error: In the event of a teach error, both LEDs flash alternately with a frequency of approx. 8 Hz.