



Distance sensor

VDM28-50-R1-IO/110/116/122-Ex



- Retroreflective laser distance sensor
- Measuring method PRT (Pulse Ranging Technology)
- Accurate, clear, and reproducible measuring results
- Red laser as the light emitter
- Version with laser class 1
- Version with IO-Link interface
- Version with analog output
- Suitable for operation in Zone 1, Zone 2, Zone 21 and Zone 22

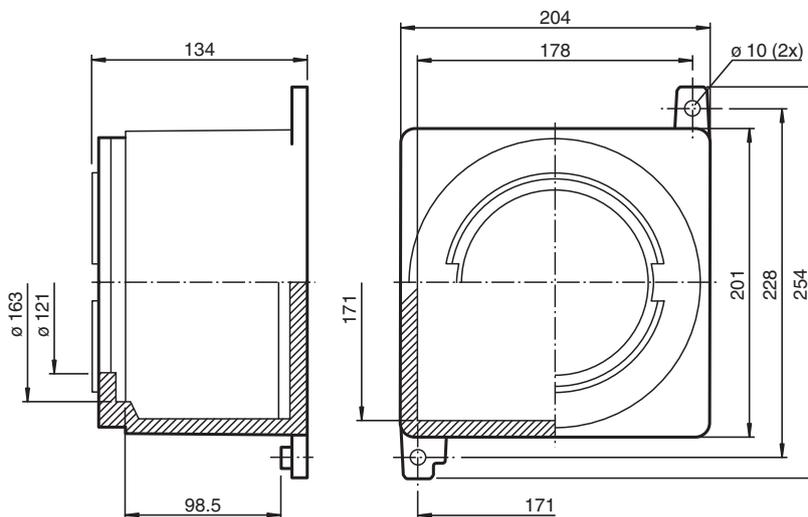
Universal distance sensor, measurement to reflector, IO-Link interface, measuring method PRT, 50 m detection range, red laser light, laser class 1, push-pull output, analog output, terminal block



Function

The VDM28 distance measurement device employs Pulse Ranging Technology (PRT). It has a repeat accuracy of 5 mm with an operating range of 0.5 ... 50 m and an absolute accuracy of 25 mm.

Dimensions



Technical Data

General specifications

Device type	GUBW1.D.OS-VDM28-50-R1
Measurement range	0.5 ... 50 m

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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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Technical Data

Reference target	OFR-100/100	
Light source	laser diode typ. service life 85,000 h at Ta = +25 °C	
Light type	modulated visible red light	
Laser nominal ratings		
Note	LASER LIGHT , DO NOT STARE INTO BEAM	
Laser class	1	
Wave length	660 nm	
Beam divergence	< 1.5 mrad	
Pulse length	approx. 4 ns	
Repetition rate	250 kHz	
max. pulse energy	< 1.5 nJ	
Angle deviation	max. ± 2°	
Measuring method	Pulse Ranging Technology (PRT)	
Diameter of the light spot	< 50 mm at a distance of 50 m at 20 °C	
Ambient light limit	50000 Lux	
Temperature influence	typ. ≤ 0.25 mm/K	
Functional safety related parameters		
MTTF _d	200 a	
Mission Time (T _M)	10 a	
Diagnostic Coverage (DC)	0 %	
Indicators/operating means		
Operation indicator	LED green	
Function indicator	2 LEDs yellow for switching state	
Teach-In indicator	Teach-In: LED green/yellow equiphase flashing; 2.5 Hz Teach Error: LED green/yellow non equiphase flashing; 8.0 Hz	
Control elements	5-step rotary switch for operating modes selection (threshold setting and operating modes)	
Control 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
Ripple	10 % within the supply tolerance	
No-load supply current	I ₀	≤ 70 mA / 24 V DC
Time delay before availability	t _v	1.5 s
Interface		
Interface type	IO-Link	
Protocol	IO-Link V1.0	
Cycle time	min. 2.3 ms	
Mode	COM2 (38.4 kBit/s)	
Process data width	16 bit	
SIO mode support	yes	
Output		
Signal output	Push-pull output, short-circuit protected, reverse polarity protected	
Switching voltage	max. 30 V DC	
Switching current	max. 100 mA	
Measurement output	1 analog output 4 ... 20 mA, short-circuit/overload protected	
Switching frequency	f	50 Hz
Response time	10 ms	
Conformity		
Product standard	EN 60947-5-2	
Laser safety	IEC 60825-1:2007	
Measurement accuracy		
Absolute accuracy	± 25 mm	
Repeat accuracy	< 5 mm	

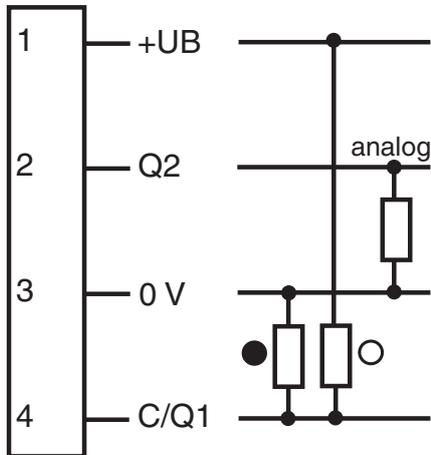
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Technical Data

Approvals and certificates	
IECEX approval	IECEX INE 14.0042X
ATEX approval	INERIS 14 ATEX 0035X
Marking	Ⓜ II 2 GD Ex db IIC T6 Gb Ex tb IIIC T85°C Db
Ambient conditions	
Ambient temperature	-30 ... 45 °C (-22 ... 113 °F)
Storage temperature	-30 ... 70 °C (-22 ... 158 °F)
Mechanical specifications	
Cable gland	Clamping range 3 ... 8.5 mm
Enclosure cover	threaded round cover
Cover fixing	flamepath thread
Flamepath grease	petroleum jelly
Degree of protection	IP66
Connection	Connection terminals, max. wire cross-section 2.5 mm ²
Material	
Enclosure	aluminum alloy
Glass	thermo-resistant tempered glass
Finish	epoxy coated RAL 7005 (grey)
Mass	approx. 6.6 kg
Grounding	M6 external grounding points

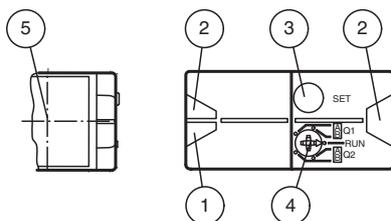
Connection Assignment

Option:



- = Light on
- = Dark on

Assembly



1	Operating display	green
2	Signal display	yellow
3	TEACH-IN button	
4	Mode rotary switch	
5	Laser output	

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Safety Information



Accessories

	PACTware 4.1	FDT Framework
	REF-MH82	Reflector with Micro-structure, rectangular 82 mm x 60 mm, mounting holes
	REF-MH50	Reflector with Micro-structure, rectangular 50.9 mm x 50.9 mm, mounting holes, fixing strap
	REF-MH78	Reflector with Micro-structure, hexagonal 78 mm x 61 mm, mounting holes
	OFR-100/100	Reflective tape 100 mm x 100 mm
	ICE2-8IOL-G65L-V1D	EtherNet/IP IO-Link master with 8 inputs/outputs
	ICE3-8IOL-G65L-V1D	PROFINET IO IO-Link master with 8 inputs/outputs
	ICE2-8IOL-K45S-RJ45	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	ICE3-8IOL-K45P-RJ45	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals
	ICE3-8IOL-K45S-RJ45	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	IO-Link-Master02-USB	IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection
	ICE1-8IOL-G30L-V1D	Ethernet IO-Link module with 8 inputs/outputs
	ICE1-8IOL-G60L-V1D	Ethernet IO-Link module with 8 inputs/outputs
	ICE2-8IOL-K45P-RJ45	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors

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Teach-In

You can use the rotary switch to select the relevant switching threshold A and/or B for teaching in for switching output **Q1**. The yellow LEDs indicate the current state of the selected output.

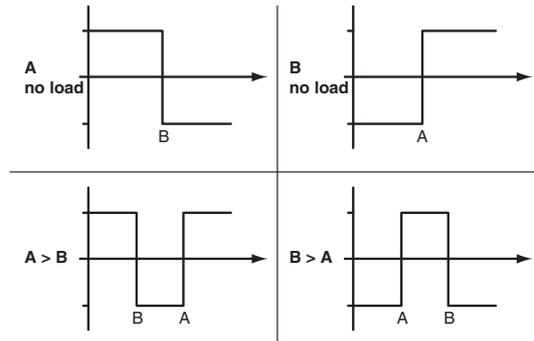
To store a switching threshold (distance measured value), press and hold the "SET" button until the yellow and green LEDs flash in phase (approx. 2 s). Teach-In starts when the "SET" button is released.

Successful Teach-In is indicated by alternating flashing (2.5 Hz) of the yellow and green LEDs.

An unsuccessful Teach-In is indicated by rapidly alternating flashing (8 Hz) of the yellow and green LEDs.

After an unsuccessful Teach-In, the sensor continues to operate with the previous valid setting after the relevant visual fault signal is issued.

Different switching modes can be defined by teaching in the relevant distance measured values for the switching thresholds A and B:



Every taught-in switching threshold can be retaught (overwritten) by pressing the SET button again.

Pressing and holding the "SET" button for > 5 s completely deletes the taught-in value. The yellow and green LEDs go out simultaneously to indicate that this procedure has been completed.

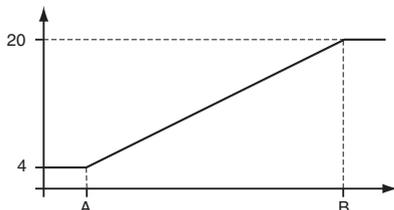
Minimum and maximum values for the analog output **Q2** are taught in in the same way as those for the switching output:

The following values apply: A = 4 mA

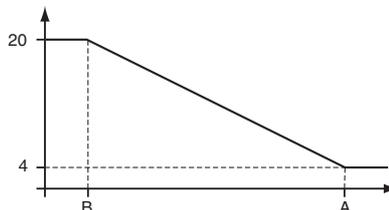
B = 20 mA

This provides three different options for operation:

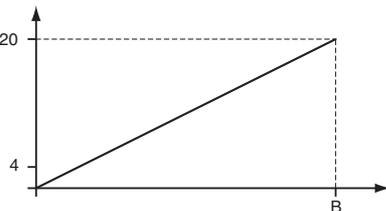
A < B -> rising slope



A > B -> falling slope



A empty -> zero start point



Reset to default settings:

Factory setting for switching output Q1:

- Switching output inactive

Factory setting for analog output Q2:

A = 200 mm

B = 5000 mm



Value B cannot be deleted

The "zero start point" operating mode can be obtained by deleting value A

- Set the rotary switch to the "RUN" position
- Press and hold the "SET" button until the yellow and green LEDs stop flashing in phase (approx. 10 s)
- When the green LED lights up continuously, the procedure is complete.

Error messages:

- Short circuit: In the event of a short circuit at the sensor output, the green LED flashes with a frequency of approx. 4 Hz.

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- Teach error: In the event of a teach error, the yellow and green LEDs flash alternately with a frequency of approx. 8 Hz.

**Note!**

The difference in the taught-in distance measured values for switching thresholds A and B must be greater than 20 mm.

If the difference in the taught-in measured values is the same as or smaller than the set switching hysteresis, the sensor will visually signal an unsuccessful Teach-In. The last distance measured value that was taught in will not be adopted by the sensor.

Select a new distance measured value for switching threshold A or B with a greater difference between the switching thresholds.

Teach in this distance measured value on the sensor again.

Switching threshold A can be deleted or set to a value of zero.

(E.g., when setting the "zero start point" curve).

However, switching threshold B can neither be deleted nor set to a value of zero.

Application

- Object identification or classification
- Positioning
- Level measurement
- Collision avoidance/distance measurement
- Compartment occupied checks
- Rack fine positioning
- Stack height control
- Coil measurement
- Dip monitoring
- Lift height checks
- Opening impulse sensor and closing edge monitoring on automatic doors, industrial gates and barrier systems
- Vehicle detection for traffic engineering purposes (e.g. monitoring of individual parking spaces)
- Height measurement in tunnels and entranceways
- Anti-collision protection on automated transport systems

Safety Information

Laser Class 1 Information

The irradiation can lead to irritation especially in a dark environment. Do not point at people!

Maintenance and repairs should only be carried out by authorized service personnel!

Attach the device so that the warning is clearly visible and readable.

Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.