



Distance sensor

VDM28-8-L1-IO/115b/136



- Distance measurement using object
- Measuring method PRT (Pulse Ranging Technology)
- Accurate, clear, and reproducible measuring results
- Red laser as the light emitter
- Version with IO-Link interface
- Laser class 1, eyesafe

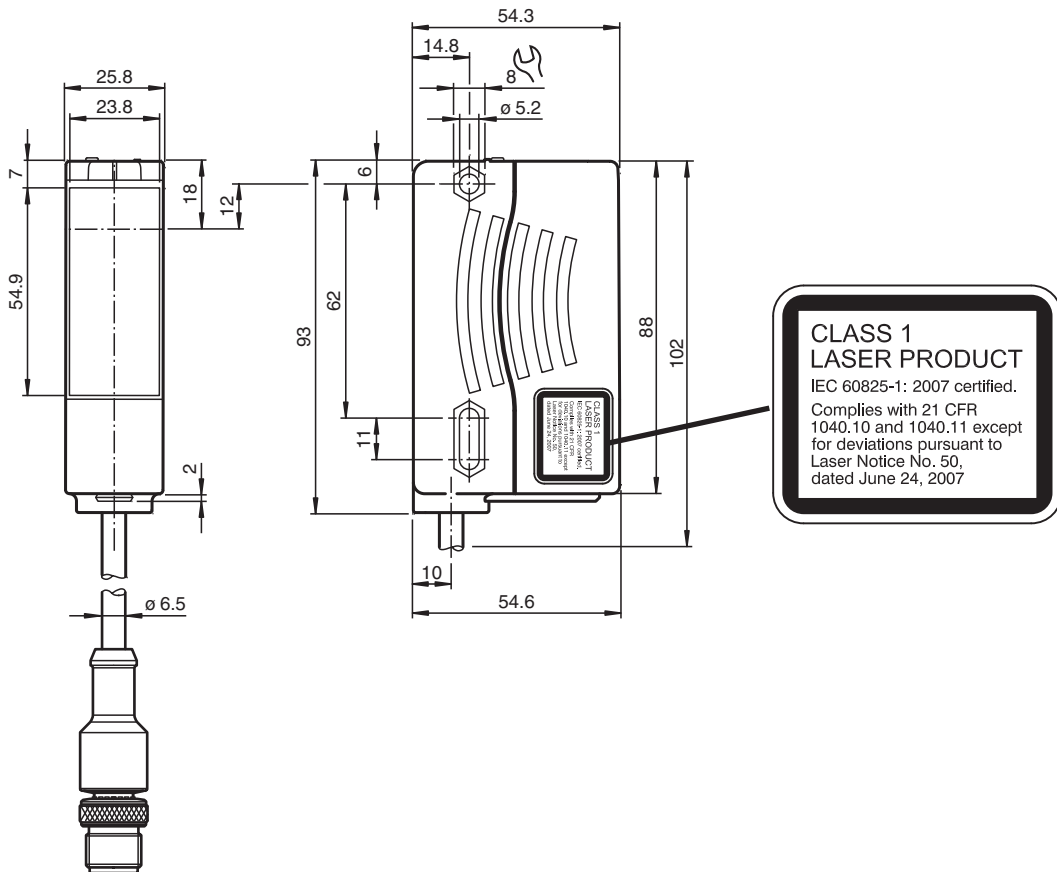
Universal distance sensor, measurement to object, IO-Link interface, measuring method PRT, 8 m detection range, red laser light, laser class 1, push-pull output, fixed cable with M12 plug



Function

The VDM28 distance measurement device employs Pulse Ranging Technology (PRT). It has a repeat accuracy of 5 mm with an operating range of 0.2 ... 50 m and an absolute accuracy of 25 mm. 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.

Dimensions



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

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Technical Data

General specifications			
Measurement range			0.2 ... 8 m
Reference target			Kodak white (90%)
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			< 10 mm at a distance of 8 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			2 push-pull (4 in 1) outputs, short-circuit protected, reverse polarity protected
Switching voltage			max. 30 V DC
Switching current			max. 100 mA
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

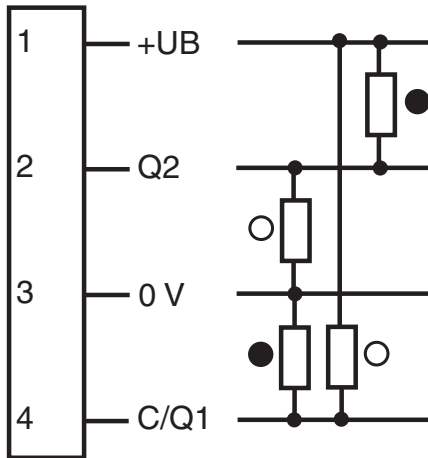
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Technical Data

Repeat accuracy	< 5 mm
Approvals and certificates	
Protection class	III
UL approval	cULus Listed, Class 2 Power Source, Type 1 enclosure
CCC approval	CCC approval / marking not required for products rated ≤36 V
FDA approval	IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007
Ambient conditions	
Ambient temperature	-30 ... 55 °C (-22 ... 131 °F)
Storage temperature	-30 ... 70 °C (-22 ... 158 °F)
Mechanical specifications	
Housing width	25.8 mm
Housing height	88 mm
Housing depth	54.6 mm
Degree of protection	IP67
Connection	300 mm fixed cable with M12 x 1, 4-pin connector
Material	
Housing	Plastic ABS
Optical face	PMMA
Mass	90 g

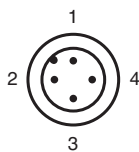
Connection Assignment

Option:



- = Light on
- = Dark on

Connection Assignment



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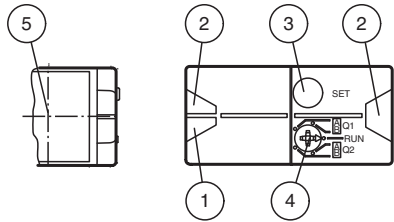
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Connection Assignment

Wire colors in accordance with EN 60947-5-2

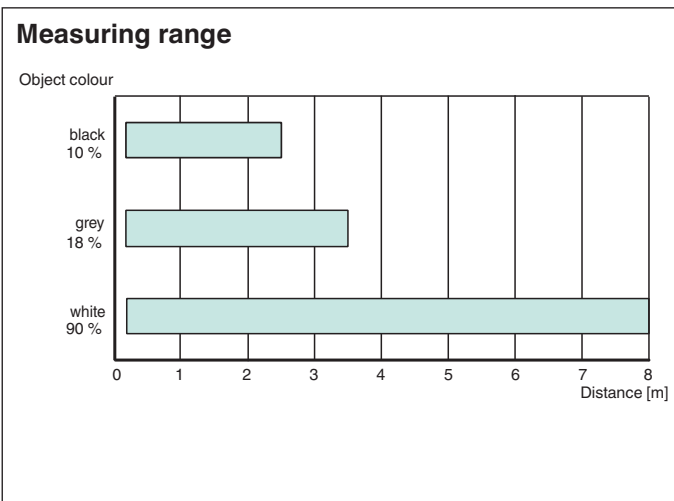
1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)

Assembly



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

Characteristic Curve



Application



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Safety Information



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.

Teach-In

You can use the rotary switch to select the output **Q1** or **Q2** and the relevant switching threshold A or B for teaching in. The yellow LEDs indicate the current state of the selected output.

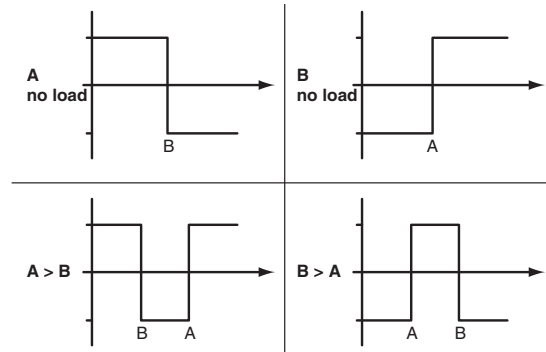
To store a switching threshold (distance measured value), press and hold the "SET" button until the yellow and green LEDs flash in phase (approx. 2 s). Teach-In starts when the "SET" button is released.

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

An unsuccessful Teach-In is indicated by 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.

Default setting:

In general, no switching points are set at the factory. The outputs are switched to low.

Reset to default settings:

- 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)
- If the green LED lights up, 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.
- 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 the switching thresholds A and B must be greater than the switching hysteresis set in the sensor.

On delivery, the switching hysteresis is 15 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.