

HANDBUCH / MANUAL / MANUEL

VDM70



CE

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1 Signs and Symbols



Warning

This symbol signals passages in the manual which must be observed at all times. Non-compliance can cause injuries or material damage.



Information

This symbol signals passages with useful information.



Warning Laser

This symbol appears in front of warning passages concerning the danger of laser beams.

2 Safety information



It is essential that this manual is read, thoroughly understood and observed before setting the VDM70 sensor into operation.

The VDM70 sensor may only be connected, mounted and adjusted by qualified personnel.

Interventions and alterations to the device are not permissible!

The VDM70 sensor is not a safety component as described by EU machine directives.



In set-up mode, the VDM70 complies with laser protection class 2 according to DIN EN 60825/1, status 2001.

The VDM70 sensor complies with laser protection class 2 according to DIN EN 60825/1, status 2001. The technical requirements comply with EN 60947-5-2, 2000 edition.

In running mode, the vdm/= works with a laser of protection class 1



Never look into the path of the laser. Do not suppress the reflex to close the eyelids.

Gazing into the beam path for longer periods can damage the retina of the eye.

When mounting the sensor, ensure if possible that the beam path is sealed off at the end.

The laser must not be directed at people (head height).

When aligning VDM70, ensure that there are no reflections on reflective surfaces.

Should the safety label on the VDM70 sensor be partly covered due to its installation position, other safety labels are to be positioned on visible parts of the sensor.

When applying the new safety label, make sure that you cannot look into the laser beam whilst reading it.

3 Description of device

VDM70-250-R/20/87/160 (measurement of distance to reflector)

The VDM70-250-R are optical distance measuring device which detect the distance to a reflector down to the millimetre in seconds. The measured values are made available via integrated digital standard interfaces.

The sensors operate according to the principle of pulsed time of flight measurement. They are particularly suitable for use in applications involving the positioning of cranes, high bay stackers as well as in high-rise and small-parts warehouses.

VDM70-10-L/87/122/160 (measurement of distance to object)

The VDM70-10-L are optical distance measuring devices which measure the distance down to the millimetre in seconds. The measured values are made available via integrated digital standard interfaces.

The sensors operate according to the principle of pulsed time of flight measurement. They are particularly suitable for use in many applications in automation technology where parts must be detected or measured over long distances.

VDM70 sensors are equipped with the following:

- LCD display and 3 buttons for complete on-site set-up
- "RS 422 interface
- "SSI compatible interface (GRAY or BIN, 24 or 25 bit)
- "2 signal outputs and an error and plausibility output
- "Bus communication with external bus adapter
- "One 4 to 20 mA analogue output (only with VDM70-10-L)

3.1 Appropriate use



VDM70 sensors are optical measuring systems for the measurement of distances and must only be used for this purpose.

*NEVER use these sensors in applications where human safety is at risk
Laser safety information*



The sensor is equipped with a red light pilot laser, laser safety class 2, for alignment purposes.

The measuring laser is an infrared laser belonging to laser safety class 1.

Running mode: Laser safety class 1

Set-up mode: Laser safety class 2

Never look into the beam !

3.2 Contents of delivery

The following is supplied in the standard delivery:

- Distance measurement device VDM70
- "Operating manual

4 Commissioning / operating

4.1 Connection

Once the device has been connected to the power supply, the display shows the measured value currently detected should an object / reflector be in the path of the beam. The green "POWER" LED lights up.

4.2 Aligning VDM70-250-R (measurement of distance to reflector)

It is possible to align the device over a max. distance of approx. 50 m using the integrated red light pilot laser (see chapter operating).

For larger distances, the aligning aid listed in the accessories is to be used. This aligning aid, makes it easily possible to check the position of the red light pilot laser spot on the reflector at very long ranges. When aligning, first check that the light spot is in the centre of the reflector at a very short distance (e. g. 1 m). The reflector is then moved to its final position with the longest range and the position of the light spot is checked again and adjusted if necessary. Finally, check the position of the light spot again close-up. The light spot must always be in the centre of the reflector whatever the position.

The fine adjustment set, available as an accessory, can be used for finer adjustment.

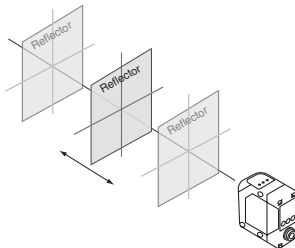


Figure 4.1 *Aligning the reflector*

Different reflector types are available according to the distance range required. Only use the reflectors specified below.

4.3 Aligning VDM70-10-L (Measurement of distance to object)

Alignment can be carried out with the aid of the integrated visible pilot laser (see chapter "Operation").

The fine adjustment set, available as an accessory, can be used for finer adjustment. Observe the information pictured below when aligning the devices.

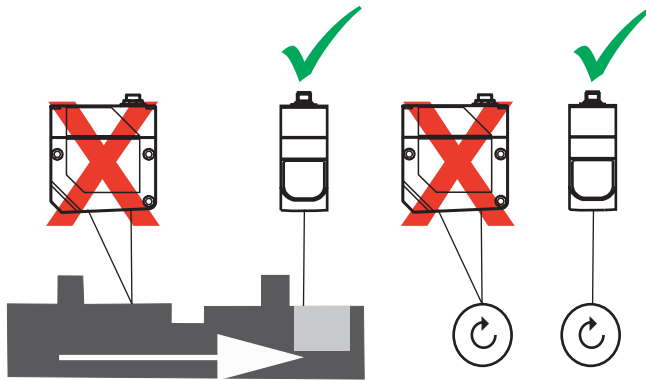


Figure 4.2 Aligning the devices

Dimensions of light spot VDM70

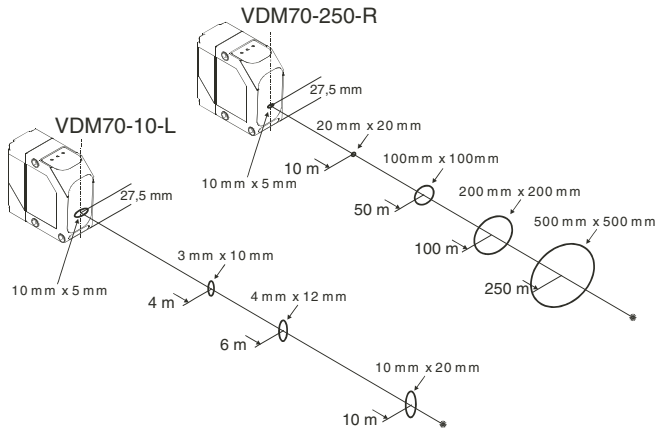


Figure 4.3 Dimensions of light spot

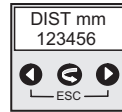
5 Operation

The VDM70 sensors are equipped with an LCD display and 3 operating buttons which control all instrument functions. All parameters can be adjusted and measured values can be read via the integrated serial interface or your own special application programme. (Parameters of RS 422 interface can only be altered on the device)

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In measuring mode:

the text "DIST mm" or "DIST INCH" (depending on unit selected) and the actual measured value are displayed on the screen.



The three operating buttons have the following general functions

Button	Name	General operating functions
	Enter button	General: Selects function and switches one menu level down or records value and switches one menu level up In operating mode: Switches to menu level (If password function is active, switches to password entry. Measuring mode remains active until correct password has been entered). When editing e.g. switching points: switches cursor position from right to left or ends entry when cursor is at the far left.
	Right arrow button	General: scrolls to the next function (right), or increases current digit by 1 when editing. In "QuickSet" menu, it enables the teach-in of Q2 In measuring mode, press this button to make the display light up.
	Left arrow button	General: scrolls to the next function (left), or reduces current digit by 1 when editing In "QuickSet" menu, it enables the teach-in of Q1 In measuring mode, press this button to make the display light up.
	ESCape function Left and right arrow buttons simultaneously	Cancels active function and switches to next menu level above (important: buttons must be pressed simultaneously, previous value is maintained unaltered)

Table 5.1 Three operating buttons

Selecting menu items:

Menu items are displayed in two forms:

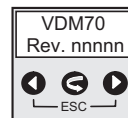
1. < Menu item > , with this display, it is possible to switch to another menu item with or , or select the menu point with
2. Menu item , with this display, the keys or can be used to alter the value.



The red pilot laser and the display's background lighting are always active in set-up mode.

When the sensor is switched on, the following message appears for approx. 2 sec.:

The software revision number must always be quoted when contacting the manufacturer with technical queries.



5.1 Menu structur

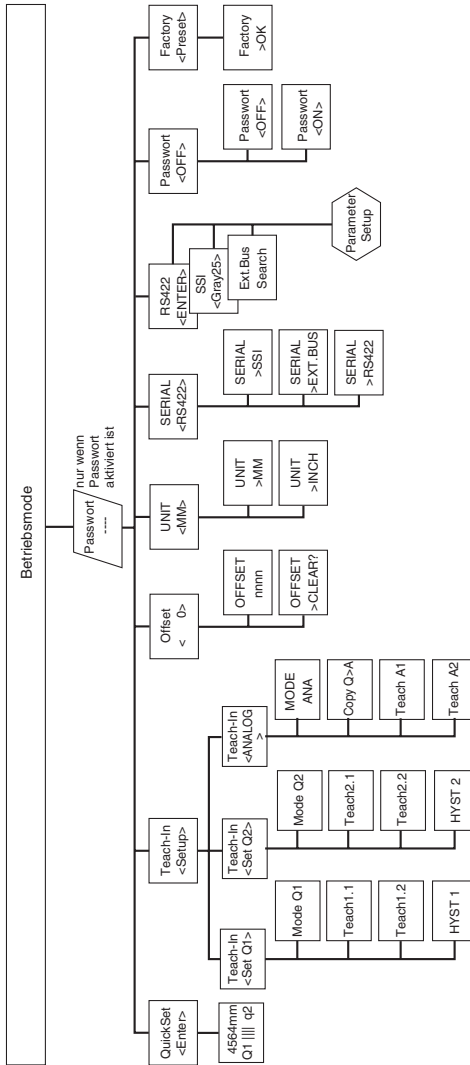


Table 5.2 Menu structur



Part No. 196790

Date of issue: 03/08/2007

Date of issue:

5.1.1 Operating mode (DIST mm)

When in operating mode, "DIST mm" or "DIST INCH" appears in the first line, depending on the active unit, and the current measured value is displayed in the second line.

When the  or  buttons are pressed, the screen lights up.

5.1.2 QuickSet

The current measured value is displayed in the top line. In the centre of the bottom line, the energy value is displayed as an alignment aid in the form of a bar graph.

Q1 and Q2 can be "taught" directly by pressing the appropriate button  or 

(Teach function not if SSI mode is active.)

Depending on the selected mode of signal outputs (see Teach-in menu), the rising or falling edge of the signal output is taught with the set hysteresis in "Single switching" mode. In "Double switching" mode, the teach point marks the centre of the switching points positioned 100 mm symmetrically either side (= rising or falling edge) with the set hysteresis.

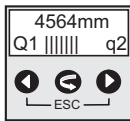
These display symbols have the following meaning:

Q1 = output 1 ON; q1 = output 1 OFF

Q2 = output 2 ON; q2 = output 2 OFF

(also indicated by yellow LEDs on the front of the device)

Quit the menu with the Enter button or ESCape function.



Example:

QuickSet menu; current measured value 4564mm,

Q1 ON, Q2 off, receiving energy approx. 50%

5.1.3 Unit (mm)

Unit makes it possible to choose between millimetres and inches as the display and output unit. The inch display and output via the interface is in 1/10 MIL or *100 Inch (1 MIL = 1/1000 inch) , i.e. display value: "123456" (/100 Inch) corresponds with 1234.56 inch or 1234560 MIL.

5.1.4 Serial Select (RS 422 / SSI)

With Serial Select it is possible to select the interface from RS 422, SSI1/10, SSI1/8 - compatible.

5.1.5 RS 422 or SSI-compatible or BUS-ADDR (RS 422 / SSI)

Depending on the setting made in Serial Select, the appropriate interface parameters are displayed or altered.

The following settings are possible: (delivery status = underlined)

- "RS 422
Baud rate: 4.8 or 9.6 or 19.2 or 38.4 or 57.6 kBaud
Data bit: 8 or 7
Stop bit: 1 or 2
REPEAT or SINGLE: REPEAT means that the sensor continuously sends measured data via the serial interface without waiting for a request. In SINGLE mode, a string of measured data is only supplied on request
- "SSI: 1/10 = LSB = 0.1mm (10MIL) or 1/8 = LSB = 0.125mm (8MIL)
Different codes: BINARY24 or BINARY25 or GRAY24 or GRAY25 are possible

5.1.6 OFFSET (0)

An offset value can be entered or taught in the value range +/-100,000mm (or corresponding inch value). The measured value is then increased or reduced by the programmed offset value, depending on the preceding sign. This can compensate a mounting position which does not correspond with the zero point of the device.

If an offset value is taught, it is automatically given a negative sign when adopted, i.e. the teach-in position corresponds with the zero point. Delivery status = 0 mm. (The preceding sign can also be set manually).

The offset value can be set back to "0" with the "CLEAR" function.

Example:

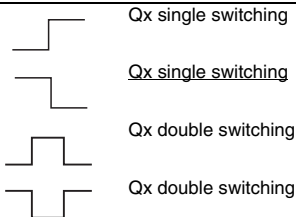
Actual distance: 3000 mm

Offset value: - 1200 mm

Output value: 1800 mm

5.1.7 TEACH IN

(Delivery status = Limit value of measurement range)



Teach-in or manual input of switching points is possible

Hysteresis: Range VDM70 = 5, adjustable in +/-1 mm steps, symmetrically around the switching point (if upper limit is reached, limit value of measurement range is valid as upper limit)

Analog output 4 to 20 mA (only VDM70-10-L)

Mode 1, rising characteristic curve



Mode 2, falling characteristic curve

COPY Q => A:


Q1 & Q2: Switching point Q1.1 becomes 0 % point (A1); Q2.1 becomes 100 % (A2) of the characteristic analog curve.





Q2 & Q1: Switching point Q1.1 becomes 100 % point (A2); Q2.1 becomes 0 % (A1) of the characteristic analog curve.



TEACH A1 A2: Teach-in of 0 % (A1) and 100 % points (A2) or manual input possible.

A minimal distance of 300 mm between points A1 and A2 must be observed.

Editing:

When the teach-in function has been completed with , the value measured at this moment is adopted and the device switches one menu level up.

If the teach-in function is ended with one of  , the edit mode is activated. The cursor flashes below the digit on the far right-hand side which can be increased or reduced by 1 using the  or  buttons.

The  button is used to switch to the next digit to the left and each digit can now be altered. Once you have reached the last digit on the left-hand side, press  again to adopt the manually edited value and switch one menu level up.

5.2 FACTORY PRESET

All settings are reset to delivery status.

5.3 PASSWORD (OFF)

Activate or deactivate password entry. Delivery status = inactive (OFF).

The password is permanently "1234" and cannot be changed.

When the device is set to "Password ON", it is only possible to quit operating mode when 1234 has been entered as password.

Measuring mode continues in the background whilst the password is being entered.

Should no entry be made in the password input menu over a period of approx. 10 seconds, operating mode reappears on the display.

Operating example for menu: QuickSet

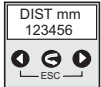


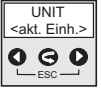
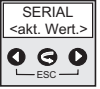
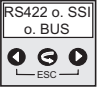
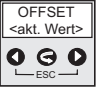


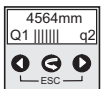
<p>Menu level 1 Operation 1.0</p>						
	<p>Display: 1st line: Text "DIST mm" 2nd line: current measured value Password input</p>					
<p>Menu level 1 PASSWORD1. 1</p>	<p>(Only when "PASSWORD" active, delivery status = inactive)</p>					
	<p>Increases current digit by 1 Reduces current digit by 1 Jumps one digit further or "confirms input" when the far left digit has been reached and is pressed. Menu level 2: if input is correct and completed with Operating mode: if input is wrong or with timeout after approx. 10 sec.</p>					
<p>Menu level 2 Quick-Set 2.1</p>	<p>UNIT 2.2</p>	<p>SERIAL 2.3</p>	<p>RS 422/ SSI 2.4</p>	<p>OFFSET 2.5</p>	<p>..... 2.x</p>	<p>Password 2.8</p>
						
<p>Menu level 3 Quick-Set 2.1.1</p>						
	<p>Teach-in Q1 or Q2 Confirm input and switch one menu level up ESC Switch one menu level up EE Energy value for alignment</p>					

Table 5.3 Operating example for menu: QuickSet

6 Commands via the serial interface (RS 422 protocol)

All commands have the following structure: <STX><Command><[Data]><EOT>

All commands are answered by VDM70 as follows:

- <NAK>** the command was not recognised or the data is outside the limit values
- or
- <ACK>** the command was recognised and executed, the command requires no return data
- or
- <Daten>** the command was recognised and the requested data has been sent

Definitions:

- STX** = start transmission = 02h = CTRL B
- EOT** = end of text = 04h = CTRL D
- NAK** = no acknowledge = 15h = CTRL U
- ACK** = acknowledge = 06h = CTRL F
- Command** = 3 digit command (ASCII text)
- [Daten]** = whole numbers (ASCII text)

In ASCII text (command+data) spaces and capitals/small letters are ignored.

User commands and their meaning

Com-mand	Name	Daten to VDM70	Daten from VDM70	Meaning
"GAP"	get all parameters	-	all parameters in text format: "VDM70 \$Revision X.XX\$" "pilot is on/off/xx seconds on" Uart mode "Q1: AA MODE = BB LIMIT1= CC LIMIT2 = DD HYST = EE INV=ON/OFF" "Q2: AA MODE = BB LIMIT1= CC LIMIT2 = DD HYST = EE INV = ON/OFF" (proximity switch only : "Qana: VALUE= FF LIMIT1= CC LIMIT2= DD INV=ON/OFF) "output = GG " "offset = YYYY " "password dis/enabled" "Error-Status = DDDDDDDD "	all parameters of VDM70 are read: X.XX : Revision no. YYYY : User offset [mm] or [10 MIL] AA : "ON"=HIGH output, "OFF"=LOW output BB : Mode: "0" = Output off, "1" = 1 Switching point "2" = 2 Switching points CC : Switching point 1, Offset..12000+Offset DD : Switching point 2, Offset..12000+Offset EE : Hysteresis, 0 to 254 [mm] GG : Unit of meas., "10 MIL" or "MM" DDD : Error status: FF : Analog value, 0 to 4095 Output of error status, with D="0": no error D="1":error: D7: Transmitter faulty D6: Receiver blinded or faulty D5: Temperature warning: T < - 10 °C or T > + 70 °C D4: Target out of range or transmitter faulty D3: Temperature error:T>+80°C D2: Supply voltage too low D1: PLL unlocked D0: always "0"
"ECM"	execute continuous measurement	-	ACK	continuous measurement output is set and triggered by the next request for measured values

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"GDB"	get energy	-	Energy value - 0 ... - 20 dB	indicates the amount of receiving energy
"GNR"	get serial number	-	"xxxxxxxxxx"	Serial no. is emitted as ASCII test (max. 24 characters).
"GSI"	get error status	-	"DDDDDD" 76543210	Output of error status, with D="0": no error D="1":error: D7: Transmitter faulty D6: Receiver blinded or faulty D5: Temperature warning: T < - 10 °C or T > + 70 °C D4: Target out of range or transmitter faulty D3: Temperature error:T>+85°C D2: Supply voltage too low D1: PLL unlocked D0: always "0"
"GTE"	get temperature	-	" +/- DDD"	DDD = internal temperature in C
"GVE"	get version	-	"VDM70 \$Revision X.XX\$"	Software version is sent
"GCM"	help command / get commands	-	All available commands	All available commands are sent in text format
"ICM"	input continuous mode	"0" , "1"	ACK	Measurement mode setting: "0" = continuous measurement output, "1" = output of single measurement values
"IDO"	input offset	- 12000 ... + 12000 bzw. - 48000 ... + 48000	ACK	Setting offset in [mm] or [INCH * 100]
"IH1"	input hystereses Q1	"000"... "254" bzw. "000" ... "999" (INCH)	ACK	Setting hysteresis around switching points of Q1 in [mm] or [INCH * 100]
"IH2"	input hystereses Q2	"000"... "254" bzw. "000" ... "999" (INCH)	ACK	Setting hysteresis around switching points of Q2 in [mm] or [INCH * 100]
"IL1"	input limit Q1 - 1	Offset ... + 12000 + Off set bzw. Offset ... 48000+Offset	ACK	Setting the first switching point of Q1 in [mm] or [INCH*100]
"IL2"	input limit Q2 - 1	Offset ... + 12000 + Off set bzw. Offset ... 48000+Offset	ACK	Setting the first switching point of Q2 in [mm] or [INCH*100]
"IL3"	input limit Q analog 1	Offset ... + 12000 + Off set	ACK	Proximity switch only: Setting 0% point of characteristic analog curve
"IL4"	input limit Q1 - 2	Offset ... + 12000 + Off set bzw. Offset ... 48000+Offset	ACK	Setting second switching point of Q1 in [mm] or [INCH*100]

"IL5"	input limit Q2 - 2	Offset ... +12000+Offset bzw. Offset ... 48000+Offset	ACK	Setting second switching point of Q2 in [mm] or [INCH*100]
"IL6"	input limit Q analog 2	Offset ... +12000+Offset	ACK	Proximity switch only: Setting 100% point of characteristic analog curve
"IM1"	input mode Q1	"0", "1", "2"	ACK	"0" = inactive, "1" = 1 switching point, "2" = 2 switching points
"IM2"	input mode Q2	"0", "1", "2"	ACK	"0" = inactive, "1" = 1 switching point, "2" = 2 switching points
"INA"	input norm Q analog	"0", "1"	ACK	Proximity switch only "0" = Q, "1" = Q inverted
"IN1"	input norm Q1	"0", "1"	ACK	"0" = Q, "1" = Q inverted
"IN2"	input norm Q2	"0", "1"	ACK	"0" = Q, "1" = Q inverted
"IVL"	input visible laser	"0", "1"	ACK	"0" = pilot laser on "1" = pilot laser off
"ISB"	input stand-by		ACK	"0" = operation, "1" = stand-by
"ESM"	trigger single measurement / Execute sing. m.	-	<meas. value>	Request for measured value with single measurement output
"EPW"	write parameter page / execute parameter write	-	ACK	Parameters are stored

Table 6.1 User commands and their meaning

6.1 Timing SSI compatible interface

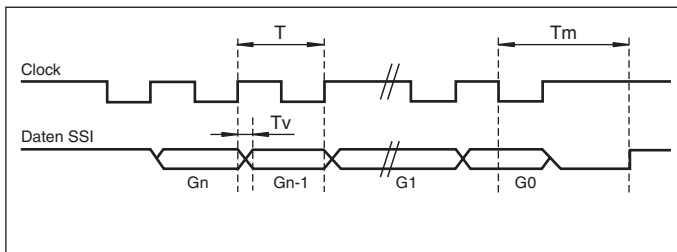


Figure 6.2 Timing SSI compatible interface

- T = Duration of clock signal, minimum 2 µSec = 500 kHz, max. 13 µSec = 77 kHz
- Tv = Delay time max. 360 ns
- Tm = Minimum time between last rising edge and reloading of SSI approx. 24 µSec.
- Gn = MSB (here Gray Code)
- 24bit transmission: G1 = second LSB, G0 = LSB
- 24+E transmission: G1 = LSB. G0 = Error bit
- 25bit transmission: G1 second LSB, G0 = LSB

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Attention:

With SSI compatible transmission, data is updated in synchronization with the readout cycle. The data is as up-to-date as the time interval between two readouts. An intermittent readout is therefore recommended. After a longer readout interval, the data contents of the first readout can be "out-of-date" and should be ignored.

7 Error messages

In the event of errors, corresponding error messages appear on the display and the error outputs Qs and Qp (active low) are set according to the following table. The error status can be questioned via the "GSI" command. In principle, a combination of several errors can exist. e.g. too low a supply voltage can cause a counter error. In this case the "GSI" command would report "0000110" (via RS 422)

Error message on LCD	Output (active low)		Answer to "GSI" command (get error status)	Meaning
	QS	QP		
"BLINDING"	active		"01000000"	External light too strong or internal error
"LAS.ERR."	active	active	"10000000"	Measurement laser faulty
"LOW VOLT"	active	active	"00000100"	Error in supply voltage: voltage too low (or error in measurement of supply voltage)
"NO VALUE"			"00000000"	First measurement after switching-on not yet ready. This message disappears after a short time.
"PLL UNLOCKED"	active	active	"00000010"	Counter error
	active		"00100000"	Temperature warning (below -10 C or above 70 C)
"OVERTEMP"	active (Laser off!)	active (Laser off!)	"00101000"	Temperature too high (above 85 C inside); Measurement switched off!
"Dist (mm) >Maximum"		active	"00010000"	No target in range or sensor badly aligned

Table 7.1 Error messages

8 Technical data

	Distance measuring devices	
	VDM70-10-L	VDM70-250-R
General specifications		
Light source	laser diode	
Approvals	CE, cULus	
Laser class	1 EN 60825-1	
Alignment aid	adjustment laser, Laser class 2	
Linearity error	+/- 8 mm	+/- 3 mm (ab 2 m)
Measurement range	0,5 ... 10 m by 90 % reflection (white)	0,5 ... 250 m on reflector
Reference target	Kodak white (90 %)	OFR-100/100
Light type	IR-Laser 900 nm adjustment laser red light 650 nm	
Diameter of the light spot	3 mm x 10 mm at a distance of 4 m	20 mm x 20 mm at a distance of 10 m
Resolution	0,1 mm or 0,125 mm	
Hysteresis H	min. 10 mm (adjustable)	
Temperature influence	< ± 5 mm absolute	
Indicators/operating means		
Operating display	LED green	
Function display	LED yellow: switching state LED orange: error message	
Operating elements	Keypad (3 membrane keys) for parameter settings on the LCD display	
Electrical specifications		
Operating voltage	18 ... 30 V DC	
Protection class	II	
Ripple	10 % within the supply tolerance	
No-load supply current I_0	190 mA	
Output		
Interfaces	RS 422, SSI	
Signal output	2 pnp, short-circuit proof, protected against reverse polarity	
Switching current	100 mA	
Measurement output	1 analogue output 4 ... 20 mA, short-circuit/ overload protected	
Response time	12 ms	
Repeat accuracy R	± 4 mm	± 2 mm
Other outputs	service output, plausibility output, PNP, short-circuit proof 50 mA	
Standard conformity		

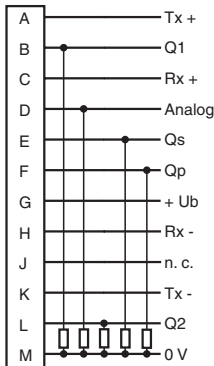
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Standards	EN 60947-5-2
Ambient conditions	
Ambient temperature	-10 ... 50 °C (263 ... 323 K)
Storage temperature	-30 ... 75 °C (243 ... 348 K)
Mechanical specifications	
Dimensions	93 mm x 93 mm x 42 mm
Protection degree	IP67
Connection	with 12-pin, M16 connector
	100 m
Material	
Housing	ABS
Optical face	PMMA
Mass	230 g
All indications regarding accuracy and distance are based on the specified surface at constant ambient conditions and with a minimum operating time of 15 minutes.	

Table 8.1 Technical data

9 Connector pin assignment

VDM70-10-L/87/122/160



VDM70-250-R/20/87/160

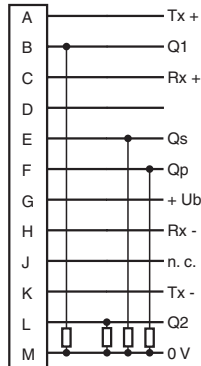
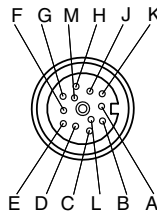


Table 9.1 Connector pin assignment



Pin	Name	Description
A	TX+	RS 422: Transmitter data / SSI: Data +
B	Q1	Signal output Q1
C	RX+	RS 422: Receiver data / SSI: Clock +
D	analog	Analog output 4 to 20 mA (only VDM70-10-L)
E	Qs	Service output Qs
F	Qp	Plausibility output Qp
G	Ub	Ub + 18 ... 30 V
H	RX-	RS 422: Receiver data / SSI: Clock -
J	NC	
K	TX-	RS 422: Sendedaten / SSI: Data -
L	Q2	Signal output Q2
M	GND	0 V (GND)

Table 9.2 Connector pin assignment

9.1 Cable lengths, shield

9.1.1 Cable length RS 422

The RS 422 interface is defined as a reliable, serial interface in full duplex mode, with transfer rates up to 10 MBaud and a cable length of 1000 m.

9.1.2 Cable length SSI

The maximum baud rate for reliable data transfer depends on the cable length.

Cable length /m	< 25	< 50	< 100	< 200	< 400
Baud rate	< 500 kHz	< 400 kHz	< 300 kHz	< 200 kHz	< 100 kHz

Table 9.3 Cable length SSI

9.1.3 RS 422 and SSI screen

The screened connection cable (see accessories) is connected to the sensor connector and the ground terminal of the control cabinet.

10 Order data / Devices and accessories

Order data	Description
OMH-VDM35	Mounting bracket
OMH-VDM35-01	Fine adjustment for mounting bracket
VDM35-AR	Aligning aid
42312A	Cable connector, connector, female 12-pin
42312A-05M-12P-SCS	Connecting cable, 12-pin, length 5 m
42312A-08M-12P-SCS	Connecting cable, 12-pin, length 8 m
42312A-20M-12P-SCS	Connecting cable, 12-pin, length 20 m
42312B	Cable connector, connector, female 12-pin, angled
42312B-05M-12P-SCS	Connecting cable, 12-pin, length 5 m, angled
42312B-10M-12P-SCS	Connecting cable, 12-pin, length 10 m, angled

42312B-20M-12P-SCS	Connecting cable, 12-pin, length 20 m, angled
42312B-30M-12P-SCS	Connecting cable, 12-pin, length 30 m, angled
OFR-250/250	Reflective tape, size: 250 mm x 250 mm
Reflektor 250 mm x 250 mm	Reflective tape, size: 250 mm x 250 mm
Reflektor 750 mm x 750 mm	Reflective tape, size: 750 mm x 750 mm

Table 10.1 Order data

11 Dimension illustrations

Mounting bracket: OMH-VDM35

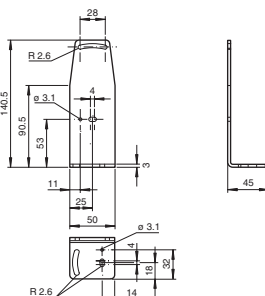


Figure 11.1 Mounting bracket

Fine adjustment for mounting bracket: OMH-VDM35-01

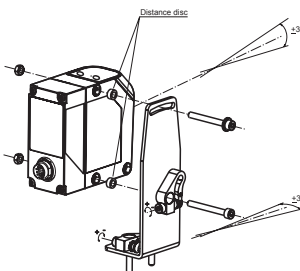


Figure 11.2 Fine adjustment for mounting bracket

Aligning aid: VDM35-AR

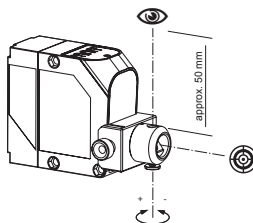


Figure 11.3 Aligning aid

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Dimensions

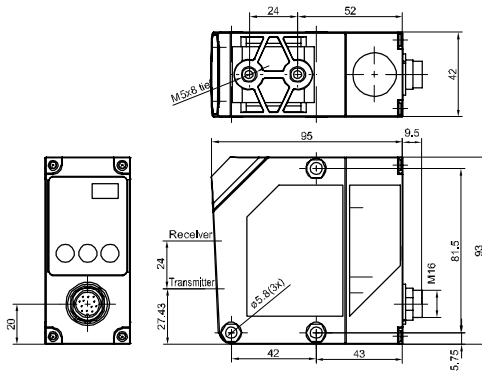


Figure 11.4 Dimensions

12 Appendix

12.1 ProfiBus, DeviceNet connector adapter

12.1.1 Measured value

Binary output: none

Binary input: none

Analog output: none

Analog input: 2 * 16bit -> (measured value in millimetres (word 0: measured value bit 0 to 15, word 1: measured value bit 16 to 32))

12.1.2 Error status

Error output consisting of 16 bits

Error bits:

Bit 15 to Bit 8: always "0"

Bit 7: No start, transmitter faulty

Bit 6: Receiver blinded or faulty

Bit 5: Temperature warning: $T < -10\text{ °C}$ or $T > +70\text{ °C}$

Bit 4: No stop signal, target out of range or receiver faulty

Bit 3: Temperature error: $T > +85\text{ °C}$

Bit 2: Supply voltage too low

Bit 1: PLL unlocked

Bit 0: always "0"

12.1.3 Parameter

none



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