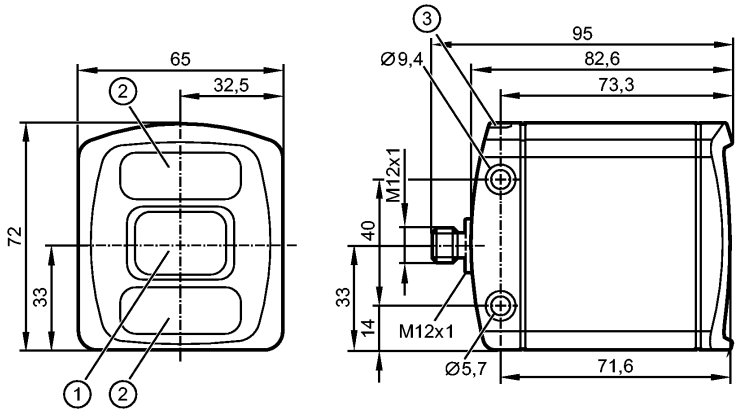
efector250

O3D304

O3DIRDKG/E1/GM/W/70

Object recognition



1: lens
2: Illumination unit
3: LED 2 colours (yellow/green)

CE

Product characteristics		
3D sensor		
Connector		
Device interfaces: digital input/output; analogue output; Ethernet		
Angle of aperture 70° x 51° (horizontal x vertical)		
Image resolution 176 x 132 pixels		
PMD 3D ToF (Time of Flight) sensor for - object dimensioning - completeness monitoring - level monitoring - distance monitoring - volume monitoring		
Electrical data		
Operating voltage	[V]	20.4...28.8 DC; to EN 61131-2
Current consumption	[mA]	< 2400 peak current pulsed; typ. mean value 420; max. mean value 1600
Power consumption	[W]	10 *)
Protection class		III (PELV)
Type of sensor		PMD 3D ToF chip
Inputs		
Circuit		2 inputs (configurable), 24 V PNP/NPN to IEC 61131-2 type 3
Trigger		external; 24 V PNP/NPN to IEC61131-2 type 3
Outputs		
Output		digital outputs: 3 (configurable), 24 V PNP/NPN acc. to IEC 61131-2 analogue outputs: 1 output (configurable as current or voltage output) **)
Max. current load per output	[mA]	100
Voltage drop	[V]	< 1
Short-circuit protection		pulsed
Overload protection		yes
Analogue output		
Accuracy (of the final value)		1 % ***)
Resolution		12 Bit

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current output	[mA]	4...20
- Max. load	[Ω]	500
- Min. load	[Ω]	230
voltage output [V]		0...10
- Min. load [Ω]		10000
Detection range		
Operating distance	[mm]	300...8000 ****)
Max. measuring range [m]		30 *****)
Resolution pixels	[pixel]	176 x 132
Angle of aperture	[°]	70 x 51 ******)
Image repetition rate max.	[Hz]	25
Software / programming		
Parameter setting options		via PC with ifm Vision Assistant
Interfaces		
parameter setting interface		Ethernet TCP/IP: 10BaseT / 100Base-TX
Process interface		Ethernet TCP/IP: 10Base-T / 100Base-TX, Ethernet/IP, PROFINET IO
IP address		192.168.0.69
subnet mask		255.255.255.000
gateway IP address		192.168.0.201
Environment		
Immunity to extraneous light	[klx]	8; *******)
Ambient temperature	[°C]	-10...50
Storage temperature	[°C]	-40...85
Protection		IP 65 / IP 67
Tests / approvals		
EMC		DIN EN 61000-6-4 radiation of interference / industrial environments DIN EN 61000-6-2 noise immunity / industrial environments
Shock resistance		DIN EN 60068-2-27 50 g / (11 ms) not repetitive DIN EN 60068-2-27 40 g / (6 ms) repetitive
Vibration resistance		DIN EN 60068-2-6 2 g / (10...150 Hz) DIN EN 60068-2-64 2.3 g RMS / (10...500 Hz)
Electrical safety		DIN EN 61010-2-201 Electrical supply only via PELV circuits
Photobiological safety		Infrared LED (850 nm) Exempt group (to DIN EN 62471)
Mechanical data		
Housing materials		housing: diecast aluminium; window: Gorilla Glass; Function display: PA (polyamide)
Tightening torque	[Nm]	0.8 (Protective cover)
Displays / operating elements		
Display		Function display 2 LED green Ethernet Operation 2 LED yellow Switching input/output 1 Switching input/output 2
Electrical connection		
Connection		M12 connector

Wiring

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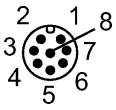
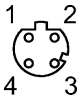


M12: Supply and switching inputs/outputs
1: U+
2: trigger input
3: GND
4: Switching output 1 (digital or analogue)
5: Switching output 3 Ready
6: Switching output 2 (digital)
7: Switching input 1
8: Switching input 2



M12: Ethernet
1: TD +
2: RD +
3: TD -
4: RD -

Other technical data

Integrated lighting	Infrared LED (850 nm) Invisible radiation of light-emitting diodes

Accessories

Accessories (included)	Protective covers

Remarks

Remarks	*) typical value **) The analog output may be used instead of digital output 1 ***) function mode current output (see operating instructions) ****) with reflectivity of 18 % and object size of 200 mm x 200 mm *****) depending on settings and reflectivity, typically up to 5000 mm ******) nominal value without lens distortion correction *******) up to 100 klx possible with reduced measuring accuracy and repeatability
Pack quantity [piece]	1

Other data

Field of view size

	without lens distortion correction		with lens distortion correction	
Measuring range / distance [m]	Length [m]	Width [m]	Length [m]	Width [m]
0.50	0.47	0.68	0.40	0.55
1.00	0.94	1.36	0.80	1.10
2.00	1.88	2.72	1.60	2.20
3.00	2.82	4.08	2.40	3.30
4.00	3.76	5.44	3.20	4.40
5.00	4.70	6.80	4.00	5.50

Repeatability of the distance measurement of an individual pixel

Measured in the centre of the image at an ambient temperature of 20°C .

The repeatability can be optimised with the filter functions.

Measuring range / distance [m]	Typical repeatability (1 Sigma) of the measured distance values on grey objects (18 % reflectivity) [mm]	Typical accuracy [mm]
0.3...1.0	± 10	± 9
1.0...3.0	± 14	± 9
3.0...5.0	± 23	± 13
5.0...7.0	± 34	± 18

7.0...8.0	± 55	± 24

Temperature drift

Typ. temperature drift of -10...+50 °C [mm/K]	0.3

Relative accuracy

Measured at a reflectivity of 18% to 90%.

Relative accuracy, typical [mm]	± 7

Setting parameters

Parameter	Setting range
Trigger mode	continuous Process interface positive edge negative edge

Dimensioning of the object

Accuracy of dimensioning of the object

Indications valid for - rectangular objects - reflectivity 6...90 %, non-shiny - minimum object size 100 x 100 x 100 mm - object in centre of the image - object speed < 0.2 m/s

Measuring range / distance [m]	Typical accuracy of the measured values for object size (length, width, height) [mm]	Typical accuracy of the measured values for object position (coordinates x, y, z) [mm]	Typical accuracy of the measured values for angle of rotation [°]
1.0...3.0	± 12	± 6	± 1.3

More data for dimensioning of the object

Image repetition frequency [Hz]	1
Operating distance [m]	0.3...5

Completeness monitoring

Minimum height of objects for completeness monitoring

	Object speed 0...0.2 m/s	Object speed > 0.2 m/s
Minimum height (typical)	25 mm	45 mm

More data for completeness monitoring

The image repetition frequency is reduced by using the anchor function.	
Image repetition frequency [Hz]	5
Operating distance [m]	0.3...5
Packaging size (orthogonal packaging arrangement)	64 objects

Level and distance monitoring

Repeatability with level and distance monitoring

Measured in the centre of the image at an ambient temperature of 20°C .
The repeatability can be optimised with the filter functions.

Measuring range / distance [m]	Typical repeatability (1 Sigma) of the measured distance values on grey objects (18 % reflectivity) [mm]	Typical repeatability (1 sigma) of an ROI (setting "ROI average value") of 50x50 pixels on grey objects (18 % reflectivity) [mm]	Typical accuracy (6-90 % reflectivity) [mm]
0.3...1.0	8	0.4	± 9

1.0...3.0	12	0.5	± 9
3.0...5.0	20	0.9	± 13
5.0...7.0	30	1.2	± 18
7.0...8.0	50	2.0	± 24