# efector250

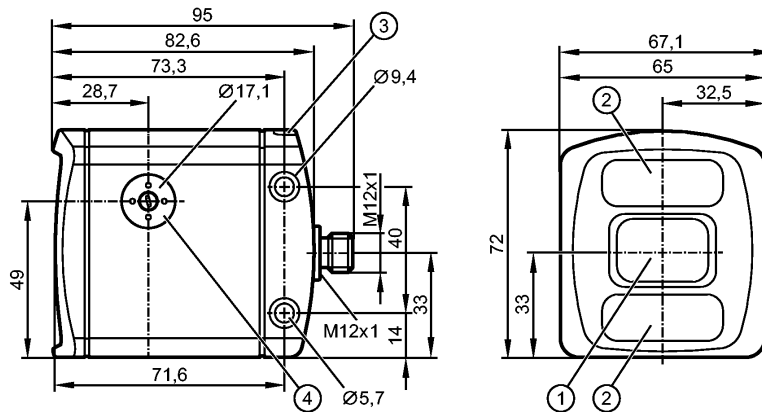## O3D300

O3DIRDKG/E1/GM/T/40

**Object recognition**



1: lens
2: Illumination unit
3: LED 2 colours (yellow/green)
4: Focus adjustment screw

| Product characteristics | |
|---|---|
| 3D sensor | |
| Connector | |
| Device interfaces: digital input/output; analogue output; Ethernet | |
| Angle of aperture 40° x 30° (horizontal x vertical) | |
| Image resolution 176 x 132 pixels | |
| PMD 3D ToF (Time of Flight) sensor for<br>- object dimensioning<br>- completeness monitoring<br>- level monitoring<br>- distance monitoring<br>- 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<br>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<br>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 % ***) |

## O3D300

O3DIRDKG/E1/GM/T/40

| | | |
|---|---|---|
| Resolution | | 12 Bit |
| 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...10000 ****) |
| Max. measuring range [m] | | 30 *****) |
| Resolution pixels | [pixel] | 176 x 132 |
| Angle of aperture | [°] | 40 x 30 ******) |
| 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 |
| MTTF | [Years] | | 43.08 |
| 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) |
| Weight | [kg] | 0.745 |

### Displays / operating elements

| | |
|---|---|
| Display | Function display 2 LED green Ethernet Operation 2 LED yellow Switching input/output 1 Switching input/output 2 |

### Electrical connection
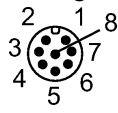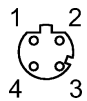
# efector250

## O3D300

O3DIRDKG/E1/GM/T/40

**Object recognition**

| Connection | M12 connector |
|---|---|

**Wiring**

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)<br>Invisible radiation of light-emitting diodes |
|---|---|

## Accessories

| Accessories (included) | USB memory stick with software and documentation; Protective covers |
|---|---|

## Remarks

| Remarks | *) typical value<br>**) The analog output may be used instead of digital output 1<br>***) function mode current output (see operating instructions)<br>****) with reflectivity of 18 % and object size of 200 mm x 200 mm<br>*****) depending on settings and reflectivity, typically up to 6000 mm<br>******) nominal value without lens distortion correction<br>*******) up to 100 klx possible with reduced measuring accuracy and repeatability |
|---|---|
| Pack quantity        [piece] | 1 |

## Other data

**Field of view size with lens distortion correction**

| Measuring range / distance [m] | Length [m] | Width [m] |
|---|---|---|
| 0.50 | 0.26 | 0.35 |
| 1.00 | 0.52 | 0.69 |
| 2.00 | 1.04 | 1.39 |
| 3.00 | 1.56 | 2.08 |
| 4.00 | 2.08 | 2.78 |
| 5.00 | 2.61 | 3.47 |

**Setting parameters**

| Parameter | Setting range |
|---|---|
| Trigger mode | continuous<br>Process interface<br>positive edge<br>negative edge |

**Dimensioning of the object**

**Accuracy of dimensioning of the object**

Indications valid for

## O3D300

O3DIRDKG/E1/GM/T/40

- 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 | ± 10 | ± 5 | ± 1 |

### 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 |

### Repeatability with level and distance monitoring

| 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] |
|---|---|---|---|
| Measured in the centre of the image at an ambient temperature of 20°C . | | | |
| The repeatability can be optimised with the filter functions. | | | |
| 0.3...1.0 | 8 | 0.3 | ± 7 |
| 1.0...3.0 | 12 | 0.4 | ± 7 |
| 3.0...5.0 | 20 | 0.7 | ± 10 |
| 5.0...7.0 | 30 | 1.0 | ± 15 |
| 7.0...8.0 | 50 | 1.7 | ± 20 |

### Temperature drift

| | |
|---|---|
| Typ. temperature drift of -10...+50 °C [mm/K] | 0.2 |