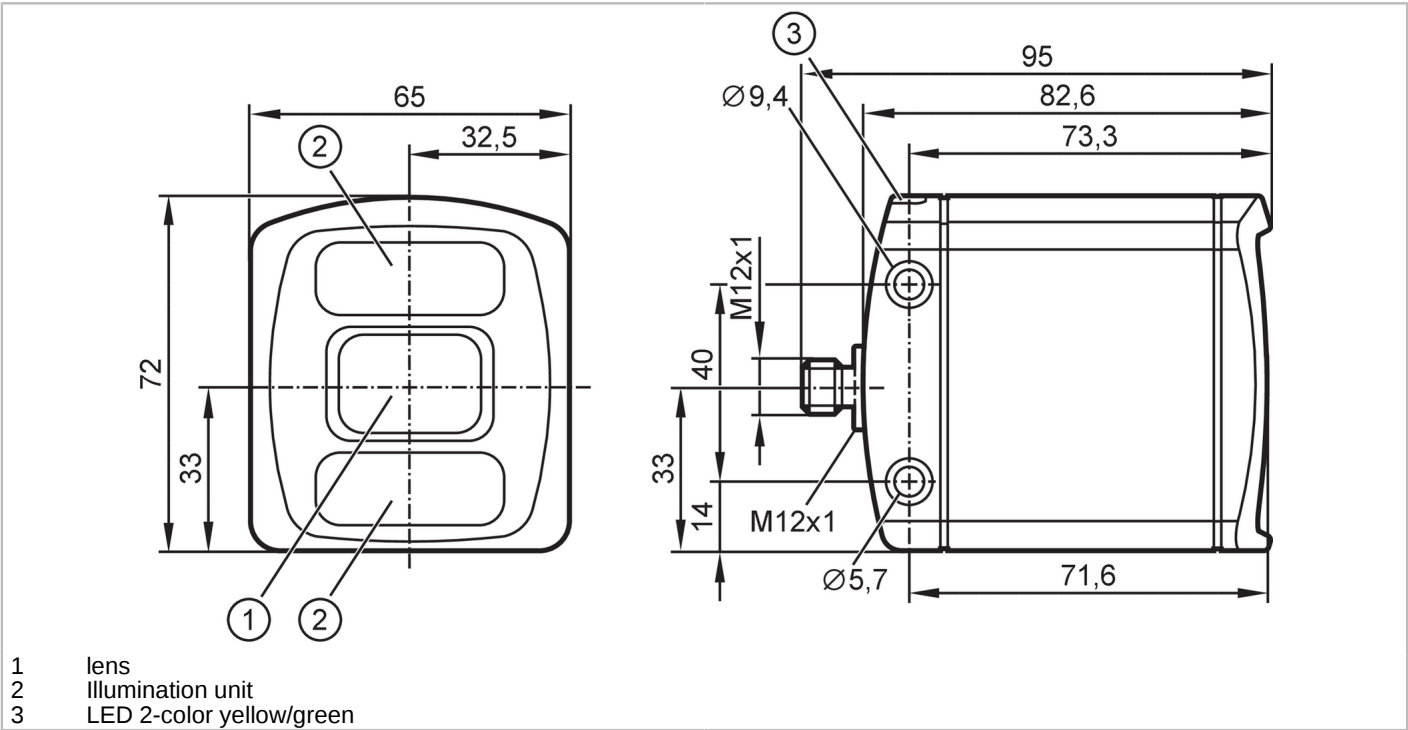


# O3D303



## ToF camera

O3DIRDKG/E1/GM/S/60



| Product characteristics      |      |                                                                                 |
|------------------------------|------|---------------------------------------------------------------------------------|
| Type of light                |      | Infrared light                                                                  |
| Image resolution 3D          | [px] | 352 x 264                                                                       |
| Angle of aperture 3D         | [°]  | 60 x 45; (nominal value without lens distortion correction)                     |
| Max. reading rate            | [Hz] | 25                                                                              |
| Housing                      |      | rectangular                                                                     |
| Application                  |      |                                                                                 |
| Application                  |      | Camera for the output of 3D image data                                          |
| Electrical data              |      |                                                                                 |
| Operating voltage tolerance  | [%]  | -15...20                                                                        |
| Operating voltage            | [V]  | 24 DC; (EN 61131-2)                                                             |
| Current consumption          | [mA] | 350; (typical)                                                                  |
| Max. current consumption     | [mA] | 830; (mean value at 24 VDC ; with switched outputs ; <1600 peak current pulsed) |
| Protection class             |      | III                                                                             |
| Overvoltage category         |      | II                                                                              |
| Type of light                |      | Infrared light                                                                  |
| Image sensor                 |      | PMD 3D ToF-Chip                                                                 |
| Integrated lighting          |      | yes; (infrared: 850 nm)                                                         |
| Inputs / outputs             |      |                                                                                 |
| Number of inputs and outputs |      | Number of digital inputs: 1; Number of digital outputs: 2                       |
| Inputs                       |      |                                                                                 |
| Trigger                      |      | 24 V PNP/NPN (IEC 61131-2 Typ 3)                                                |
| Number of digital inputs     |      | 1; (including trigger input)                                                    |



## ToF camera

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|                                           |                                                                                 |
|-------------------------------------------|---------------------------------------------------------------------------------|
| Input circuit of digital inputs           | 24 V PNP/NPN; (configurable; IEC 61131-2 Typ 3)                                 |
| <b>Outputs</b>                            |                                                                                 |
| Total number of outputs                   | 2                                                                               |
| Electrical design                         | 24 V PNP/NPN; (EN 61131-2)                                                      |
| Number of digital outputs                 | 2; (configurable)                                                               |
| Max. voltage drop switching output DC [V] | 1                                                                               |
| Max. current load per output [mA]         | 100                                                                             |
| Short-circuit protection                  | yes                                                                             |
| Type of short-circuit protection          | yes (non-latching)                                                              |
| Overload protection                       | yes                                                                             |
| <b>Monitoring range</b>                   |                                                                                 |
| Operating distance [mm]                   | 300...8000                                                                      |
| Note on operating distance                | object size: 200 x 200 mm                                                       |
|                                           | reflectivity: 18 %                                                              |
| Image resolution 3D [px]                  | 352 x 264                                                                       |
| Angle of aperture 3D [°]                  | 60 x 45; (nominal value without lens distortion correction)                     |
| Max. reading rate [Hz]                    | 25                                                                              |
| <b>Measuring/setting range</b>            |                                                                                 |
| Measuring range [m]                       | < 30                                                                            |
| <b>Software / programming</b>             |                                                                                 |
| Parameter setting options                 | via PC with ifm Vision Assistant or XML-RPC; software API for C, C++ and Halcon |
| <b>Interfaces</b>                         |                                                                                 |
| Communication interface                   | Ethernet                                                                        |
| <b>Ethernet</b>                           |                                                                                 |
| Number of Ethernet interfaces             | 1                                                                               |
| Transmission standard                     | 10Base-T; 100Base-TX                                                            |
| Transmission rate                         | 10 MBit/s; 100 MBit/s                                                           |
| Protocol                                  | TCP/IP                                                                          |
| Factory settings                          | IP address: 192.168.0.69                                                        |
|                                           | subnet mask: 255.255.255.0                                                      |
|                                           | gateway IP address: 192.168.0.201                                               |
| Usage type                                | Parameter setting; Data transmission                                            |
| <b>Operating conditions</b>               |                                                                                 |
| Ambient temperature [°C]                  | -10...50                                                                        |
| Storage temperature [°C]                  | -40...85                                                                        |
| Max. relative air humidity [%]            | 90; (non condensing)                                                            |
| Max. height above sea level [m]           | 4000                                                                            |
| Protection                                | IP 65; IP 67                                                                    |
| Pollution degree                          | 3                                                                               |
| Max. immunity to extraneous light [klx]   | 8; (with reduced measuring accuracy and repeatability: < 100)                   |

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| Tests / approvals                                                                   |                                                                                                                                     |                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| EMC                                                                                 | DIN EN IEC 61000-6-4                                                                                                                | radiation of interference / industrial environments |
|                                                                                     | DIN EN IEC 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)                           |
| Laser protection class                                                              | 1                                                                                                                                   |                                                     |
| Notes on laser protection                                                           | Caution invisible laser radiation                                                                                                   |                                                     |
|                                                                                     | EN 60825-1:2014 +A11:2021                                                                                                           |                                                     |
|                                                                                     | IEC 60825-1:2014                                                                                                                    |                                                     |
|                                                                                     | Complies with 21 CFR 1040.10 except for conformance with IEC 60825-1 Ed. 3, as described in Laser Notice No. 56, dated May 8, 2019. |                                                     |
| Electrical safety                                                                   | DIN EN IEC 61010-2-201                                                                                                              | electrical supply only via PELV circuits            |
| MTTF [years]                                                                        | 37                                                                                                                                  |                                                     |
| Mechanical data                                                                     |                                                                                                                                     |                                                     |
| Weight [g]                                                                          | 766.95                                                                                                                              |                                                     |
| Housing                                                                             | rectangular                                                                                                                         |                                                     |
| Dimensions [mm]                                                                     | 72 x 65 x 82.6                                                                                                                      |                                                     |
| Material                                                                            | housing: diecast aluminium; front lens: gorilla glass; Function display: PA                                                         |                                                     |
| Tightening torque [Nm]                                                              | < 0.8                                                                                                                               |                                                     |
| Displays / operating elements                                                       |                                                                                                                                     |                                                     |
| Display                                                                             | Function                                                                                                                            | 2 x LED, green Ethernet Power                       |
|                                                                                     | Switching status                                                                                                                    | 2 x LED, yellow OUT 1 OUT 2                         |
| Accessories                                                                         |                                                                                                                                     |                                                     |
| Items supplied                                                                      | Protective covers                                                                                                                   |                                                     |
|                                                                                     | spring washers                                                                                                                      |                                                     |
| Remarks                                                                             |                                                                                                                                     |                                                     |
| Remarks                                                                             | Repeatability and accuracy depend on the image settings and the environmental conditions                                            |                                                     |
|                                                                                     | The data sheet values apply to typical settings and conditions.                                                                     |                                                     |
| Pack quantity                                                                       | 1 pcs.                                                                                                                              |                                                     |
| Electrical connection - Ethernet                                                    |                                                                                                                                     |                                                     |
| Connector: 1 x M12; coding: D; Contacts: 4                                          |                                                                                                                                     |                                                     |
|  |                                                                                                                                     |                                                     |
| 1                                                                                   | TD +                                                                                                                                |                                                     |
| 2                                                                                   | RD +                                                                                                                                |                                                     |
| 3                                                                                   | TD -                                                                                                                                |                                                     |
| 4                                                                                   | RD -                                                                                                                                |                                                     |

# O3D303

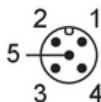


## ToF camera

O3DIRDKG/E1/GM/S/60

### Electrical connection - Process connection

Connector: 1 x M12; coding: A; Contacts: 5



|   |                              |
|---|------------------------------|
| 1 | U+                           |
| 2 | trigger input                |
| 3 | GND                          |
| 4 | Switching output 1 Ready     |
| 5 | Switching output 2 Cascading |

### 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                           | 0.40                               | 0.56      | 0.37                            | 0.50      |
| 1.00                           | 0.80                               | 1.13      | 0.75                            | 1.00      |
| 2.00                           | 1.60                               | 2.26      | 1.50                            | 2.00      |
| 3.00                           | 2.40                               | 3.39      | 2.25                            | 3.00      |
| 4.00                           | 3.20                               | 4.52      | 3.00                            | 4.00      |
| 5.00                           | 4.00                               | 5.65      | 3.75                            | 5.00      |

#### repeatability of the distance measurement of an individual pixel

| Measuring range / distance [m] | repeatability of the measured distance values on grey objects (18% reflectivity) [mm] | Accuracy [mm] |
|--------------------------------|---------------------------------------------------------------------------------------|---------------|
|                                | typical value                                                                         | typical value |
| 0.3...1.0                      | ± 8                                                                                   | ± 7           |
| 1.0...3.0                      | ± 12                                                                                  | ± 7           |
| 3.0...5.0                      | ± 20                                                                                  | ± 10          |
| 5.0...7.0                      | ± 30                                                                                  | ± 15          |
| 7.0...8.0                      | ± 50                                                                                  | ± 20          |

measured in the center of the image at an ambient temperature of 20°C

The repeatability can be optimized with filter functions

Repeatability 1  $\sigma$

#### Relative accuracy

|                                |          |
|--------------------------------|----------|
| Relative accuracy              | ± 4 mm   |
| Temperature drift -10...+50 °C | 0.2 mm/K |

measured at a reflectivity of 18% to 90%

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## ToF camera

O3DIRDKG/E1/GM/S/60

### Parameter setting options

| Parameter                       | Setting range                                                                        | Factory setting  |
|---------------------------------|--------------------------------------------------------------------------------------|------------------|
| Exposure time [ms]              | 0.002...10                                                                           | 5                |
| dynamic range                   | low; Normal operation ; high                                                         | Normal operation |
| filter                          | Time function:                                                                       |                  |
|                                 | mean value; adaptive exponential                                                     | disabled         |
|                                 | 3D function:                                                                         |                  |
|                                 | mean value, median, bilateral function                                               | disabled         |
| Trigger                         | Continuous; data interface; positive edge; negative edge; positive and negative edge | Continuous       |
| Image repetition frequency [Hz] | 0.02...25                                                                            | 5                |

### data format

| data type                        | data value           | Remarks                                    |
|----------------------------------|----------------------|--------------------------------------------|
| Distance [mm]                    | 0...65535 uint16     | radial distance                            |
| Cartesian coordinates x,y,z [mm] | -32767...32767 int16 | x,y: lateral position z: vertical distance |
| amplitude                        | 0...65535 uint16     | object brightness                          |