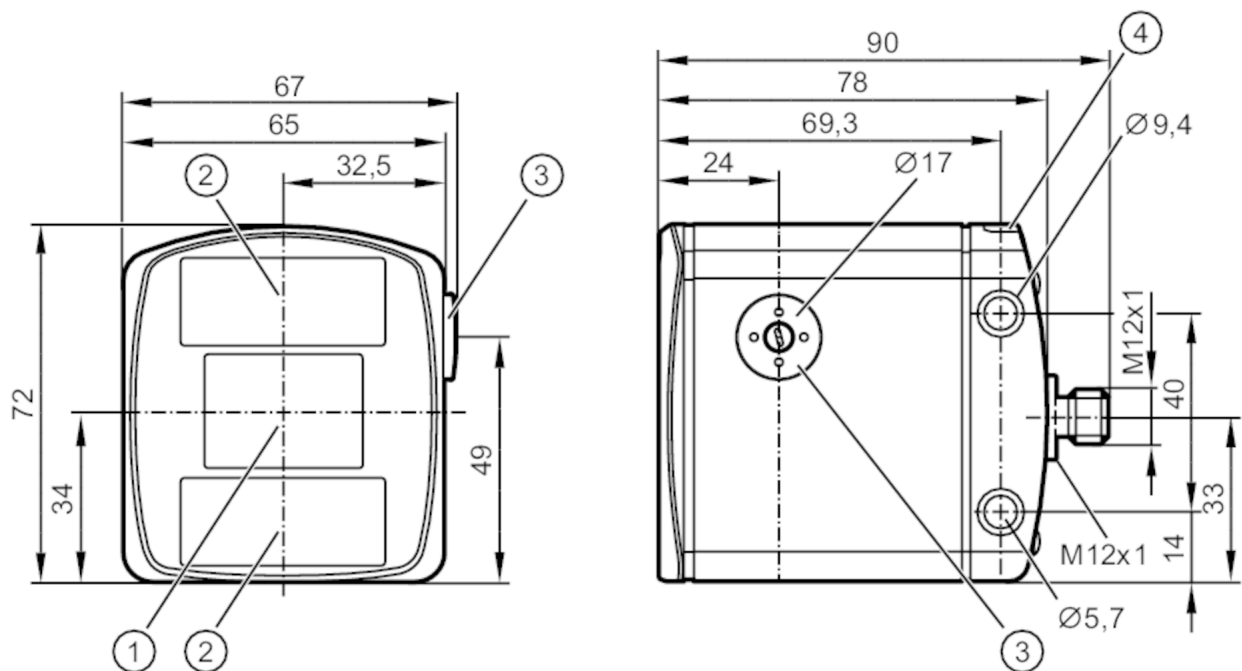


# O3D311



## ToF camera

O3DIRDKG/E1/GM/T/40



- 1 lens
- 2 illumination unit
- 3 Focus adjustment screw
- 4 LED 2-color yellow/green



### Product characteristics

|                                    |                                                             |
|------------------------------------|-------------------------------------------------------------|
| Type of light                      | Infrared light                                              |
| Image resolution 3D [px]           | 352 x 264                                                   |
| Angle of aperture 3D [°]           | 40 x 30; (nominal value without lens distortion correction) |
| Image repetition frequency 3D [Hz] | 25                                                          |
| Housing                            | rectangular                                                 |

### Application

|             |                                        |
|-------------|----------------------------------------|
| Application | Camera for the output of 3D image data |
|-------------|----------------------------------------|

### Electrical data

|                               |                                          |
|-------------------------------|------------------------------------------|
| Operating voltage [V]         | 20.4...28.8 DC; (EN 61131-2)             |
| Current consumption [mA]      | 420; (maximum mean value: < 1600 mA)     |
| Max. current consumption [mA] | 2400; (peak current pulsed)              |
| Power consumption [W]         | 10; (typical value)                      |
| Protection class              | III                                      |
| Overvoltage category          | II                                       |
| Type of light                 | Infrared light                           |
| Image sensor                  | PMD 3D ToF-Chip                          |
| Integrated lighting           | infrared: 850 nm invisible radiation LED |



## ToF camera

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| Inputs / outputs                          |                                                                                 |                                                     |
|-------------------------------------------|---------------------------------------------------------------------------------|-----------------------------------------------------|
| Number of inputs and outputs              | Number of digital inputs: 1; Number of digital outputs: 2                       |                                                     |
| Inputs                                    |                                                                                 |                                                     |
| Trigger                                   | external; 24 V PNP/NPN (IEC 61131-2 Typ 3)                                      |                                                     |
| Number of digital inputs                  | 1                                                                               |                                                     |
| Outputs                                   |                                                                                 |                                                     |
| Number of digital outputs                 | 2; (configurable)                                                               |                                                     |
| Output function                           | 24 V PNP/NPN; (EN 61131-2)                                                      |                                                     |
| 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                                                                             |                                                     |
| Monitoring range                          |                                                                                 |                                                     |
| 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 [°]                  | 40 x 30; (nominal value without lens distortion correction)                     |                                                     |
| Image repetition frequency 3D [Hz]        | 25                                                                              |                                                     |
| Software / programming                    |                                                                                 |                                                     |
| Parameter setting options                 | via PC with ifm Vision Assistant or XML-RPC; software API for C, C++ and Halcon |                                                     |
| Interfaces                                |                                                                                 |                                                     |
| Communication interface                   | Ethernet                                                                        |                                                     |
| Ethernet                                  |                                                                                 |                                                     |
| Transmission standard                     | 10Base-T; 100Base-TX                                                            |                                                     |
| Transmission rate                         | 10; 100                                                                         |                                                     |
| 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                                            |                                                     |
| Operating conditions                      |                                                                                 |                                                     |
| Ambient temperature [°C]                  | -10...50                                                                        |                                                     |
| Storage temperature [°C]                  | -40...85                                                                        |                                                     |
| Protection                                | IP 65; IP 67; IP 69K                                                            |                                                     |
| Max. immunity to extraneous light [klx]   | 8; (with reduced measuring accuracy and repeatability: < 100)                   |                                                     |
| Tests / approvals                         |                                                                                 |                                                     |
| EMC                                       | DIN EN 61000-6-4                                                                | radiation of interference / industrial environments |
|                                           | DIN EN 61000-6-2                                                                | noise immunity / industrial environments            |

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|                        |                              |                                          |
|------------------------|------------------------------|------------------------------------------|
| 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)                |
| Photobiological safety | exempt group; (DIN EN 62471) |                                          |
| Electrical safety      | DIN EN 61010-2-201           | electrical supply only via PELV circuits |
| MTTF                   | [years]                      | 45.02                                    |

### Mechanical data

|                   |      |                                                                                  |
|-------------------|------|----------------------------------------------------------------------------------|
| Weight            | [g]  | 1139.2                                                                           |
| Housing           |      | rectangular                                                                      |
| Dimensions        | [mm] | 72 x 67 x 90                                                                     |
| Material          |      | housing: stainless steel (1.4404 / 316L); front lens: PMMA; 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 |
|----------------|-------------------|

### 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



|   |      |
|---|------|
| 1 | TD + |
| 2 | RD + |
| 3 | TD - |
| 4 | RD - |



## ToF camera

O3DIRDKG/E1/GM/T/40

## Electrical connection - Process connection

Connector: 1 x M12; coding: A



|   |                              |
|---|------------------------------|
| 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<br>correction |           | with lens distortion<br>correction |           |
|-----------------------------------|---------------------------------------|-----------|------------------------------------|-----------|
| Measuring range /<br>distance [m] | Length [m]                            | Width [m] | Length [m]                         | Width [m] |
| 0.50                              | 0.27                                  | 0.36      | 0.26                               | 0.35      |
| 1.00                              | 0.53                                  | 0.73      | 0.52                               | 0.69      |
| 2.00                              | 1.07                                  | 1.46      | 1.04                               | 1.39      |
| 3.00                              | 1.60                                  | 2.19      | 1.56                               | 2.08      |
| 4.00                              | 2.13                                  | 2.92      | 2.08                               | 2.78      |
| 5.00                              | 2.67                                  | 3.65      | 2.61                               | 3.47      |

## repeatability of the distance measurement of an individual pixel

| Measuring range / distance [m] | repeatability of the measured distance<br>values on grey objects (18% reflectivity)<br>[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  $\sigma$

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### Relative accuracy

|                                          |          |
|------------------------------------------|----------|
| Relative accuracy                        | ± 4 mm   |
| Temperature drift -10...+50 °C           | 0.2 mm/K |
| measured at a reflectivity of 18% to 90% |          |

### 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                          |