



**Meet the most versatile,
lightest, smallest and affordable
industrial-grade ToF depth camera**

Terabee 3Dcam VGA combines price, performance and versatility to come out a winner. Robust, IP65 and IP67-rated, this device is the smallest, lightest and most affordable industrial-grade Time-of-Flight 3D camera in its class. With the widest field of view (90°, 67.5°), VGA resolution (640 x 480 pixels) and IP65 and IP67 ratings, 3Dcam VGA is a key component in industrial automation and industry 4.0 solutions. Applications include logistics, mobile robotics, human-machine interaction, level monitoring, smart agriculture and people and movement detection. You are free to use existing code libraries and to run applications on the edge for even greater process efficiency.

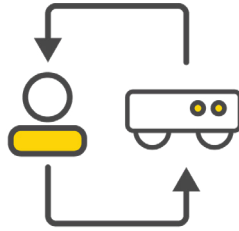
Key features

- Eye-safe near infrared VGA (640 × 480 pixels) Time-of-Flight camera
- Wide Field of View (90° × 67.5°)
- Range: 0.35 m to 5 m, for indoor use, up to 30 frames per second
- Rugged IP65 - IP67 rated enclosure
- Compact and lightweight form factor: 100 × 87 × 32 mm, < 450 g
- Gigabit Ethernet, RS485 and digital output
- Embedded open edge computing platform for customizable applications

Applications



Logistics



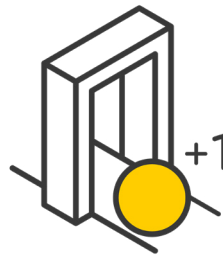
Human-machine
interaction & mobile
robotics



Level
monitoring



Smart
agriculture



People and
movement
detection



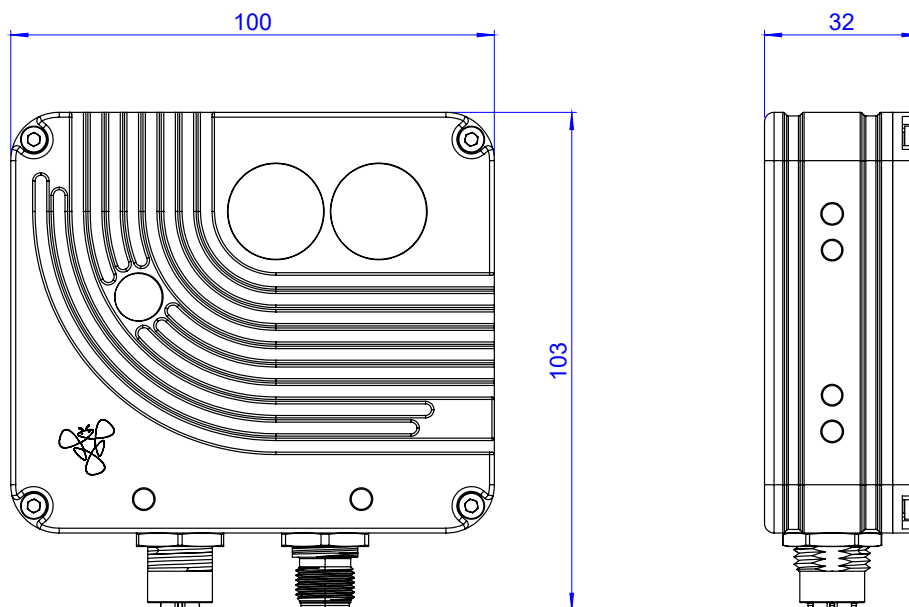
Technical specifications

| | |
|--|---|
| Product code | TB-3DCAM-VGAS-940 (base connectors) TB-3DCAM-VGAB-940 (back connectors) |
| Performance | |
| Detection principle | Near infrared Time-of-Flight |
| Resolution | 640 pixels × 480 pixels (VGA) |
| Output information | Depth, active (or passive) infrared, point cloud |
| Range ^{(a)(b)} | 0.35 m to 5 m |
| Frame rate ^(c) | Up to 30 frames per second (FPS) |
| Output distance resolution | 1 mm |
| Accuracy ^{(a)(b)} | ~5 mm (below 1 m), 1-2% (above 1 m) |
| Repeatability ^{(a)(b)} | < 1.5% |
| Field of View (FOV) | 90° × 67.5° |
| Angle per pixel | 0.14° × 0.14° |
| Image area ^(d) | 2.0 m × 1.33 m, at 1 m target distance 10.0 m × 6.7 m, at 5 m target distance |
| Light source wavelength | 940 nm - Laser Class 1 ^(e) |
| On-board computing | Quad-core ARM Cortex A53 @ 1.2 GHz, 1GB SDRAM 32 GB SD Flash. Linux® (DietPi) operating system |
| Electronics | |
| Supply voltage V_{IN} DC | 10-30 V |
| Max power consumption ^(f) | 10 W |
| Interfaces | |
| Data connectivity | Proprietary protocol over TCP/IP |
| Digital output ^(g) | 1x Open Collector (source, <500 mA) on M12 5-pin Programmable via SW as static or pulse width modulation (PWM) |
| Serial interface (console) | RS485 (half-duplex) on Connector 1 - Power (PWR) |
| Data interface | Gigabit Ethernet on Connector 2 - Ethernet (ETH) |
| Visual notification | LED (multicolor) |
| Mechanics | |
| Dimensions ^(h) [mm] L × W × H | 100 × 103 × 32 (TB-3DCAM-VGAS-940) 100 × 87 × 49.5 (TB-3DCAM-VGAB-940) |
| Weight ^(h) | 435 g (TB-3DCAM-VGAS-940) 477 g (TB-3DCAM-VGAB-940) |
| Enclosure rating ^(e) | IP65 and IP67 |
| Housing material | Aluminum, acrylic glass |
| Type of connection | Connector 1 - Power (PWR): M12 A-coded male connector, 5-pin Connector 2 - Ethernet (ETH): M12 X-coded female connector, 8-pin |
| Ambient temperature operation (at $V_{IN} = 24$ V) | -10°C to +45°C |
| Mounting | Sides, front, and back-side with threaded holes for M5 and ¼"-20 tripod screws Alignment (4H7) pinholes on sides |
| Software | |
| Client machine | x86_64 PC |
| Operating system for companion software development kit (SDK) and graphical user interface (GUI) | Linux® (Ubuntu 18.04 and 20.04, 64-bit) ⁽ⁱ⁾ Microsoft Windows® 10, 64-bit |
| SDK programming language(s) | C++ ^(j) , Python ^(k) |
| Initialization time | 10 s |
| Third-party compatibility | OpenCV, ROS (Melodic, Noetic) |
| Conformity | |
| Reference standard ^(e) | CE, RoHS, Laser Class 1, Vibration & Shock |

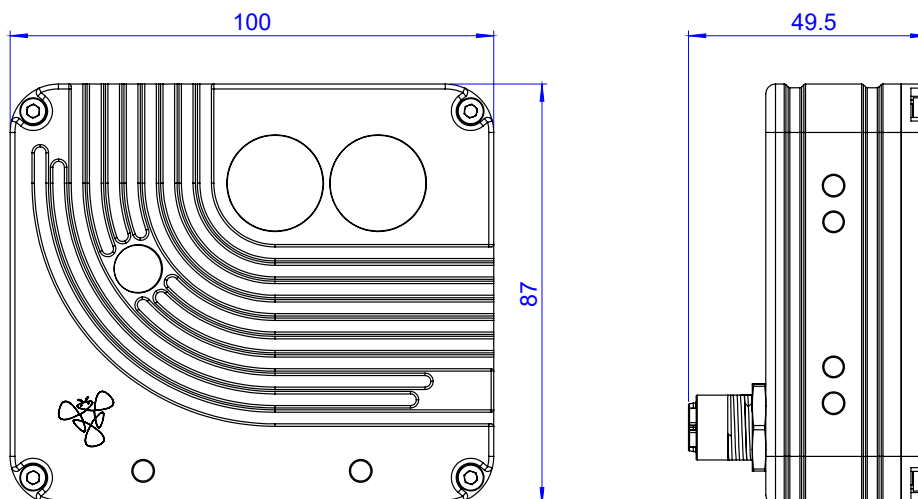
- (a) Specifications are derived from tests in controlled conditions (target with 80% diffuse reflectivity, indoor fluorescent lighting, ambient temperature around 25°C, subject to change). Note that bright sunlight, target surface reflectivity, and other variables can affect camera performance.
- (b) Calculated around the center over ~20% of the total pixels. Repeatability is evaluated as one standard deviation over multiple measurements over time. Data subject to change.
- (c) Can vary depending on network conditions and programming/output choices.
- (d) Derived from Field of View (FOV). If frame distortion removal is applied, you need to consider a 5% reduction in each direction.
- (e) Refer to the conformity certificate in the User Manual for details
- (f) Without load
- (g) The digital output (static or PWM) pin has to be considered 'Auxiliary' as its activation and/or modulation (PWM logic is arbitrary, i.e., it requires the user to program the camera depending on the specific application.
- (h) Including M12 connectors
- (i) Debian-based distributions in general, but only Ubuntu 18.04 and 20.04, 64-bit, tested
- (j) C++ from version 17 - Mingw64 and MSVC2019 environments (Microsoft Windows®)
- (k) Python version 3.6 (Linux® Ubuntu 18.04), version 3.8 (Linux® Ubuntu 20.04 and Microsoft Windows®)

Dimensions including connectors (in mm)

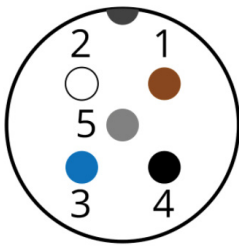
Base connectors (TB-3DCAM-VGAS-940)




Back connectors (TB-3DCAM-VGAB-940)



Connector 1 - Power (PWR) - pinout

| M12 A-coded (male) | Pin No. | Function | Description |
|---|---------|--------------|---|
|  | 1 | $V_{IN DC}$ | +10 to 30 V power supply |
| | 2 | GND | Ref. potential (power supply and data) |
| | 3 | Static - PWM | Digital output (static or PWM) |
| | 4 | Tx/Rx+ | RS485 differential line (debug console) |
| | 5 | Tx/Rx- | RS485 differential line (debug console) |

Connector 2 - Ethernet (ETH) - pinout

| M12 A-coded (male) | Pin No. | Function | Description |
|---|---------|----------|------------------|
|  | 1, 2 | D1+,D1- | Gigabit Ethernet |
| | 3, 4 | D2+,D2- | |
| | 5, 6 | D3+,D3- | |
| | 7, 8 | D4+,D4- | |

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