©Wang Song123RF.com
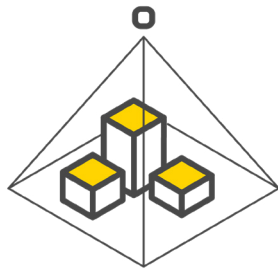
Meet the most versatile, lightest, smallest and affordable industrial-grade ToF depth camera

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.
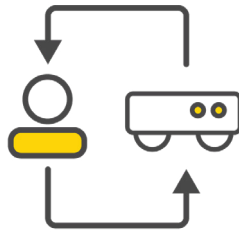
Key features

- 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

Terabee, 90 Rue Henri Fabre, 01630,
St-Genis-Pouilly, France (5 km from Geneva Airport)

+33 7 50 15 16 64
terabee-sales@terabee.com
www.terabee.com

Applications

Logistics
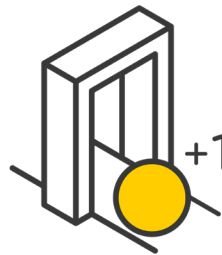

Human-machine
interaction & mobile
robotics

Level
monitoring

Smart
agriculture

People and
movement
detection
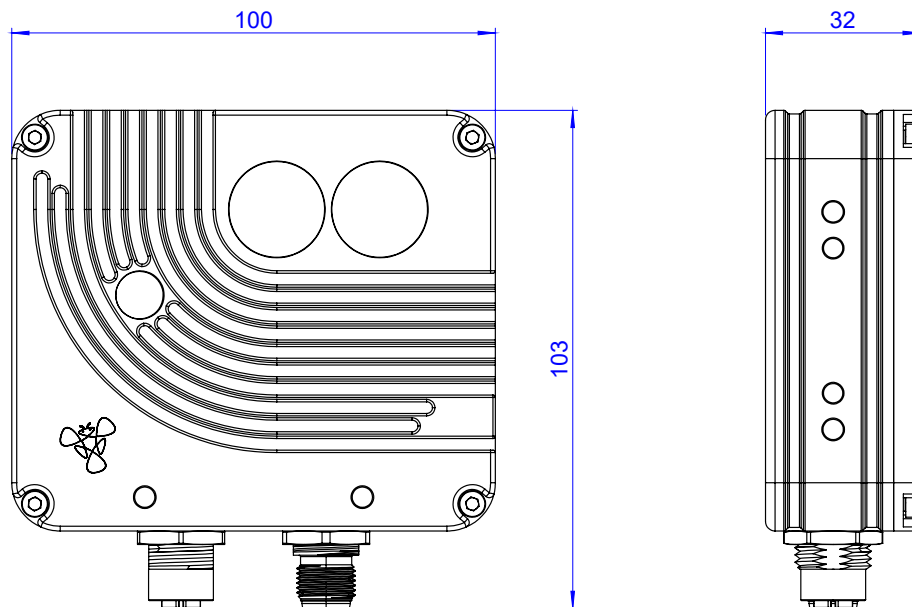
Technical specifications

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

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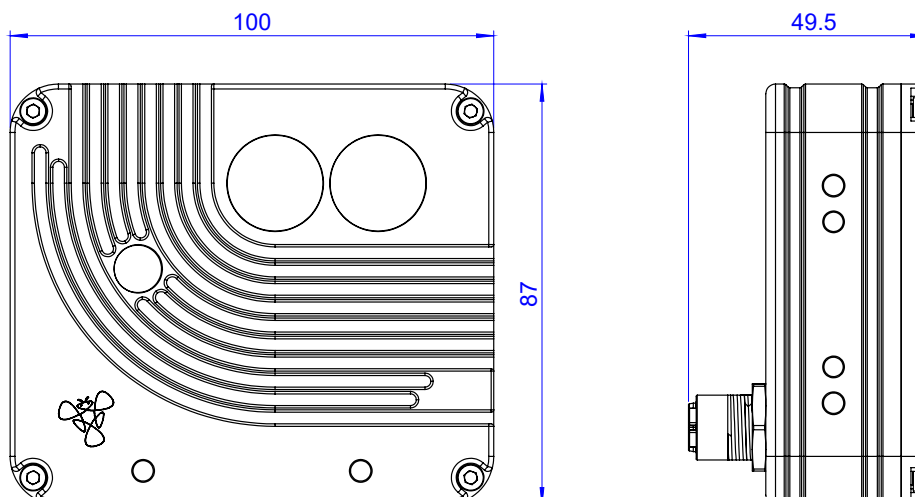+33 7 50 15 16 64
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(a) Specifications are derived from tests in controlled conditions (target with 80% diffuse reflectivity, indoor fluorescent lighting, ambient temperature around 25°C, subject to change). Note that bright sunlight, target surface 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)
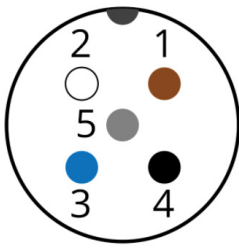
Base connectors (TB-3DCAM-VGAS-940)

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

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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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