

olive™ AI Camera

OLV-CAM01-TP

PRODUCT DATASHEET





THE ROS-READY AI CAMERA: OLIVE ROBOTICS OLV-CAM01-TP

olive™ AI Camera OLV-CAM01-TP is a versatile and high-quality camera made for demanding computer vision and perception tasks in robotics and automation. It is designed to be re-programmable and easy to integrate allowing you to quickly connect it to an existing system. Thanks to its integrated tensor processing unit (TPU) it can perform demanding machine learning and computer vision computation directly on the device. This device speaks ROS and ROS2 natively out-of-the-box via its virtual Ethernet over USB C interface.

Its integrated 9D IMU module features a 3-axis gyroscope, accelerometer and magnetometer allowing you to measure and track the device's orientation with respect to a fixed frame over time. The integrated web-based user interface features an intuitive programming IDE allowing you to implement custom AI-powered sensor fusion algorithms within minutes.

KEY FEATURES

- Native out-of-the-box ROS and ROS2 communication
- Built-in AI-accelerator for edge AI, machine learning and computer vision
- Resolution up to 1920x1080 FHD, Framerate up to 120 fps
- Ships with pre-configured Linux Real-time Kernel and Debian-based OS
- Onboard 9D IMU with 1000Hz included

COMPONENTS

- Powerful 2 Megapixel RGB sensor: The OV2710-1E is a true full HD (1080p) CMOS image sensor designed specifically to deliver high-end HD video to your robotic application.
- AI-accelerator: The built-in edge TPU is capable of performing 4 trillion operations per second (4 TOPS), using 2 watts of power—that's 2 TOPS per watt. For example, it can execute state-of-the-art mobile vision models such as MobileNet v2 at almost 400 frames per second, in a power efficient manner using TensorFlow Lite.
- 9-DOF inertial measurement unit: The olive™ OLV-CAM01-TP is equipped with a powerful integrated IMU module featuring a 3-axis gyroscope, 3-axis accelerometer and 3-axis

magnetometer that provides accurate and reliable tracking of the camera's position and orientation.

- 4-measurements environmental sensor: The device further features a gas sensor measuring relative humidity, barometric pressure, ambient temperature, and gas (VOC).
- ARM-based mobile processing unit for data processing and communication via ROS and ROS2 based on Linux Debian 11 featuring Ethernet over USB-C connectivity.
- Full-body industry grade aluminum frame (Aluminum 6082 | AlSi1MgMn)

SPECIFICATIONS

- Integrated real-time Linux Debian 11 operating system for data processing, communication, and modular programming.
- Preconfigured onboard embedded processing for ROS Noetic and ROS2 Humble Hawksbill message handling
- Native Virtual Ethernet over USB-C connections interfaces
- Embedded virtual Ethernet communication protocol. The format of the actual networking data encapsulated in each packet is based on IEEE802.3-2008.
- Integrated embedded data logging
- Integrated web graphical user interface for sensor parameter settings, calibration, and data logging.
- Integrated firmware and software updates over the air (OTA) using the web-based user interface.
- Embedded Integrated Development Environment (IDE) for programming on the sensor using Python and/or C/C++.
- Integrated time synchronization using the Network Time Protocol (NTP)
- Integrated ESC protection.
- Full-body industry grade aluminum frame (Aluminum 6082 | AlSi1MgMn)

INSTALLATION & USE

For detailed instructions on how to install and use this product please visit the online [documentation](#). You can find code samples and further instructions at <https://github.com/olive-robotics>. For complaints and feedback please reach out to support@olive-robotics.com.

TECHNICAL SPECIFICATIONS

Dimensions	40x40x30mm
Weight	89 grams
Operational Voltage	5.0V (PD)
Max. Current	3000mA
Power Consumption	Typical: <5W Max: 15W
Temperature Range	Commercial: 0° ... 55°C Industrial: -40° ... 85°C
Hardware Connector	USB Type-C
Application Processor	Dual Cortex-A7 up to 800MHz
Real-Time Processor	Cortex-M4 MPU up to 200MHz
TPU AI Accelerator	Google Coral Edge TPU and PMIC 4 Trillion Operations per Second
Memory On Chip (SoC)	512 MB RAM
EEPROM Memory	512 Bytes x 8
On SOM Flash Memory	Default: 64 GB SD Max Expansion: 512 GB
Connectivity	1x Virtual Ethernet over USB-C (up to 0.5 Gbps), 1x USB 2.0 Host

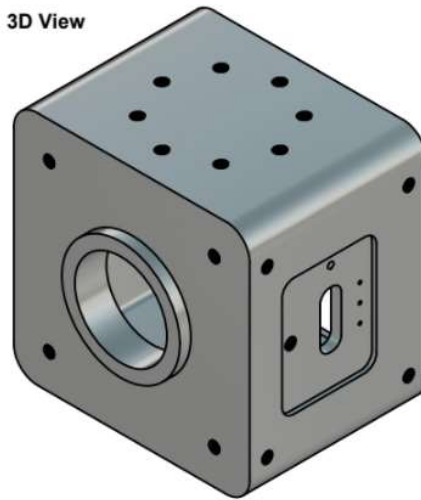
Software Specs

Linux Kernel	Linux 5.10.8 RT24
Base OS	Debian 11 Bullseye
Communication Middleware	Apache Cyclone DDS
Communication Interface	ROS, ROS2, ssh, https
Default IP Address	10.42.0.7
Web GUI address	https://10.42.0.7

NOTES, UNLESS SPECIFIED OTHERWISE

1. ALL UNITS ARE IN mm
2. BREAK ALL SHARP EDGES
3. DRAWING AND TOLERANCE STANDARD ISO 2768-1

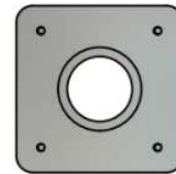
3D View



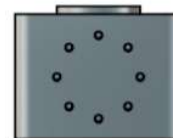
Bottom



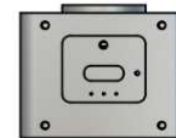
Top



Side



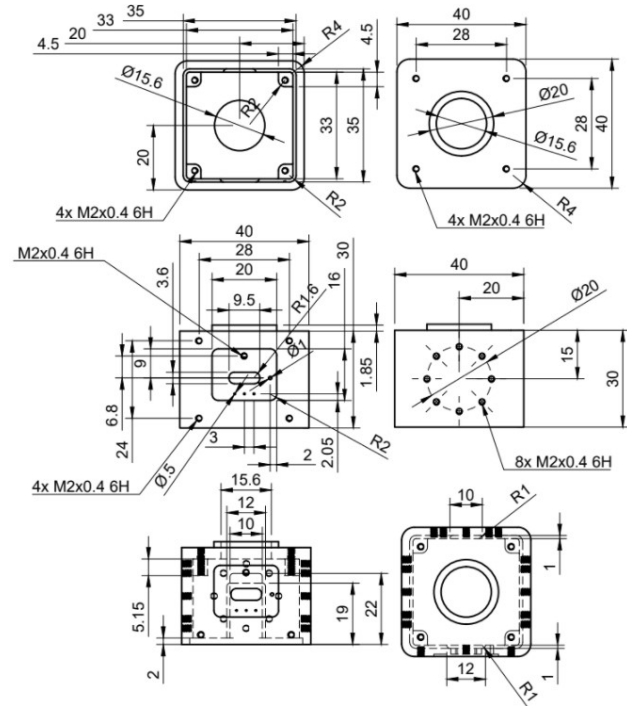
Front



Default User	olive
Default Password	one
ROS 1 Version	Noetic Ninjemys
ROS 2 Version	Humble Hawksbill

Image Sensor

Sensor Type	1/2.7" OmniVision OV2710
Max Resolution	1920(H)x1080(V) pixels
Lens	2.1mm (L210) / 1.8mm (L180)
Frame Rate	640x480 VGA @120fps 1280x720 HD @60fps 1920x1080 FHD @30fps



Gyroscopes & Accelerometers

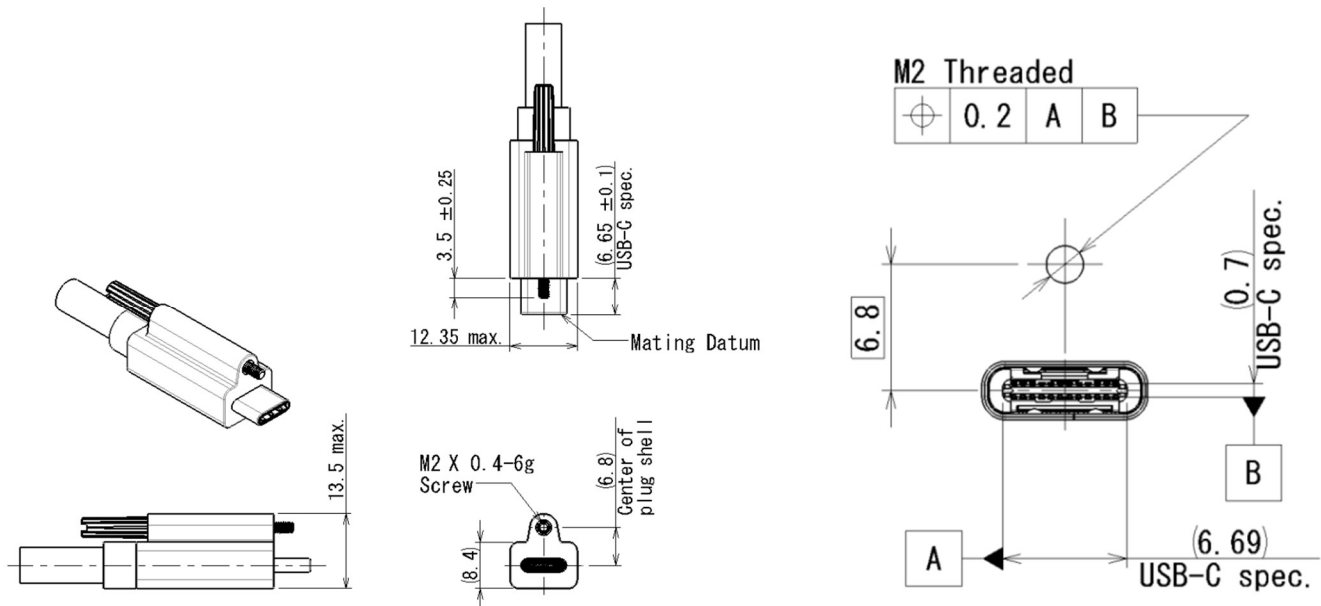
Gyroscope	
Range	+/- 2000 deg/sec
Accuracy	+/- 0.05 deg/sec
Accelerometer	
Range	+/- 16 g
Accuracy	+/- 0.1 g
Magnetometer	
Range	+/- 4 gauss
Accuracy	+/- 0.2 gauss
ROS Messages	sensor_msgs/Imu
Sample rate	1000 Hz

Environmental Sensing

Operation range (full accuracy)	
Pressure	300 ... 1100 hPa
Humidity	0 ... 100%
Temperature	-40 ... 85°C
Gas sensor	
Response time (τ 33-63%)	< 1 s (for new sensors)
Sensor-to-sensor deviation	+/- 15% +/- 15
Power consumption	< 0.1 mA in ultra-low power mode
Humidity sensor	
Response time (τ 0-63%)	8 s
Accuracy tolerance	\pm 3 % relative humidity

Hysteresis	$\leq 1.5\%$ relative humidity
Pressure sensor	
RMS Noise	0.12 Pa (equiv. to 1.7 cm)
Sensitivity Error	$\pm 0.25\%$ (equiv. to 1 m at 400 m height change)
Temperature coefficient offset	± 1.3 Pa/K (equiv. to ± 10.9 cm at 1°C temperature change)
ROS Messages	sensor_msgs/Temperature sensor_msgs/RelativeHumidity sensor_msgs/FluidPressure std_msgs/UInt16
Sample Rate	1000 Hz

USB CONNECTOR SPECIFICATIONS



The USB-C hardware connector on the OLV-IMU01-13D is designed to be compatible with the standard single screw USB Type-C locking plug revision 1.0 as elaborated by the USB-IF Device Working Group in 2016. Please find further details in the figure above and [here](#).

SAFETY INSTRUCTIONS

Do not operate the device in or near liquids. This device is designed to be used indoors; outdoor use is not recommended. Do not open the device unless you are a trained professional in electrical engineering or similar. Opening the device will void any warranty. Do not use these components to build devices that are capable of harming humans. During operation, a human must always monitor the device. Only connect to third-party devices (computers, power supplies, etc.) that are CE certified under IEC 62368.

DISPOSAL

In general, electrical and electronic equipment (EEE) should not be disposed of along with household waste. EEE may contain hazardous substances which, if exposed, could cause a serious detrimental effect on the environment, wildlife, and human health.

For more information about the disposal of electronic waste, please refer to the EU directive for Waste from Electrical and Electronic Equipment (WEEE).

If you would like to dispose of this product or parts of it, we recommend that you:

- Reach out to contact@olive-robotics.com for instructions on how to return the product to the vendor.
- Donate the unwanted item to a charitable organization.
- Take it to an authorized recycling collection point run by your local authority. For information about collection points, visit <https://erp-recycling.org/en-de/where-to-recycle>.

OLIVE ROBOTICS GMBH

Based in Munich, Germany, Olive Robotics GmbH is a leading provider of advanced software-defined robot hardware components. The sensors and actuators in our product portfolio are designed to be re-programmable and easy to integrate, allowing users to build their own custom robots or extend existing systems with ease. We design, engineer, and assemble the entirety of our product's hardware and software here in Munich. Our plug and play design allows for quick and effortless installation, making it possible for anyone to create their own robot solutions in an fast and intuitive manner. You can find more information about our company on [our website](#). Furthermore, you can find a dedicated overview of our products [here](#).

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