OAK-D IoT-75 (USB boot)

1 Features

- Movidius Myriad X VPU
- 32Kb I2C EEPROM
- USB3.1, gen2 10gbps
- 2x 2-lane MIPI connects OV9282 1MP global shutter cameras with no IR filter
- 1x center 4-lane MIPI connects IMX378 12 MP color rolling shutter camera
- ¼ -20 tripod mount on the bottom of the unit
- VESA-spec (7.5cm, M4) set of mounting holes on the back of the unit

2 Applications

- Industrial automation
- Robotics
- Surveillance IP camera
- Security systems
- Remote intelligence

3 Description

The Luxonis OAK-D IoT-75 is an AI Edge vision system driven by Movidius Myriad X VPU. The system is powered over a USB Type-C. OAK-D IoT-75 has three on-board cameras which implement stereo and RGB vision, piped directly into the DepthAI Myriad X VPU for depth and AI processing. The data is then output to a host via USB 3.1 Gen1.

OAK-D IoT-75 integrates ESP32-WROOM-32D (Wi-Fi 2.4 GHz to 2.5 GHz) module which connects OAK-SoM-IoT over QSPI.

Flashing/debugging ESP32 is possible over UART bridge, connecting to micro USB2 connector over USB.

Device Information

PART NUMBER	SIZE (WxHxD)
OAK-D-IoT-75	104mm x 41mm x 23.3mm

Figure 1 – OAK-D IoT-75

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4 Electrical Characteristics

4.1 Absolute Maximum Ratings[1]

SYMBOL	RATINGS	MIN	MAX	UNIT
V_{BUS}	USB input supply voltage range.[2]	3.5	5.5	V
I_{VBUS}	Maximum input current requirement		2	A
T_{stq}	Ambient temperature	0	60	C

4.2 Recommended Operating Conditions

SYMBOL	RATINGS	MIN	TYP	MAX	UNIT
V_{BUS}	VBUS input supply voltage		5V	5.25	V
P	Power consumption requirement	4	6	7.5	W
P_{IDLE}	VBUS idle power draw (Myriad X booted)		2.5		W
T_A	Ambient operating temperature			50	°C

1) Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions*. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
2) According to industry standard Universal Serial Bus (USB) specifications

5 IoT device with integrated ESP32 module

OAK-D IoT-75 integrates ESP32-WROOM-32D module connected to the OAK-SoM-IoT (Myriad X) over two QSPI busses. SPI1 bus (VDDIOB_GPIO) is meant to be used for main data flow between Myriad X and EPS32, where ESP32 is master. This bus uses a 3V3 GPIO logic level and is also fully exposed on one of the headers on the PCB (for more refer to the schematics).

Second QSPI bus is SPIO0, ESP32, Myriad X, NOR flash and IMU (BNO086) are all connected to the same bus. SPI NOR flash is a peripheral which is selected with CS0 and can be accessed from both Myriad X and ESP32 (read/write). IMU is also peripheral and can be selected with CS1. In most use cases ESP32 is master, but in the same way Myriad X can be master accessing both peripherals.

Communication between EPS32 and Myriad X is not meant to be executed on the SPI0 bus, but in case that would be requiered both can be either a master or a slave device.

This bus uses a 1V8 GPIO logic level and is also fully exposed on one of the headers on the PCB (for more refer to the schematics).

6 Camera sensors characteristics

6.1 Center Color Camera

The color sensor on the stereo depth module in addition to color image provides texture information. Usages for the texture information include overlay on a depth image to create a color point cloud and overlay on a 3D model for reconstruction.

Parameter	Value
Image sensor	Sony IMX378
Active pixels	4056x3040@60fps
Output video format	RAW12/10/8
Focus type	Auto Focus 8cm - ∞ / Fixed Focus 50cm- ∞
FOV	78°
Shutter Type	Rolling shutter
IR sensitive	No

6.2 Stereo vision gray scale camera

Stereo cameras compare the features and based on the disparity determines the distance/depth of the object tracked on by the product. It also provides the depth map in color and raw depth map in gray scale.

Parameter	Value
Image sensor	OmniVision OV9282
Active pixels	1280x800@120FPS
Output video format	8/10-bit RAW
Focus type	Fixed Focus 19.6cm - ∞
FOV	89.5°
Shutter Type	Global shutter
IR sensitive	No

7 Mechanical Information

The following information is the most current data available for the designated device. This data is subject to change without notice and without revision of this document.

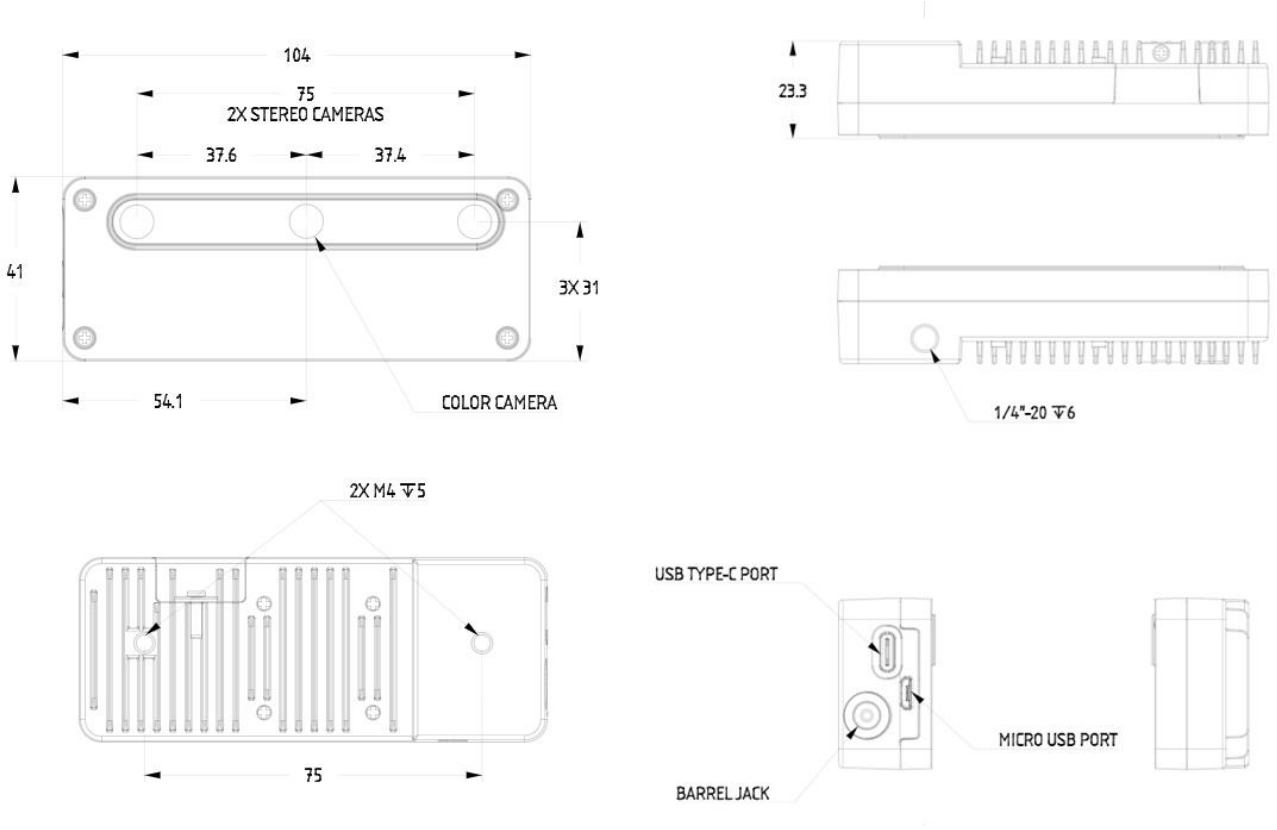

Figure 2 – OAK-D IoT-75 Mechanical measurements