**OAK-D Pro PoE**

## 1 Features

- Movidius Myriad X VPU
- 256/512/1024MBit QSPI NOR Flash
- 32Kb I2C EEProM
- Gigabit Ethernet + PoE power
- 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
- Active IR stereo
- IR Laser dot projector (Belago 1.1)
- IR Flood LED light (SFH 4725AS)
- 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 Pro PoE is an AI Edge vision system driven by Movidius Myriad X VPU. The system is powered with Power over Ethernet (PoE). OAK-D Pro PoE 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 Gigabit Ethernet connection. In addition to stereo cameras the OAK-D Pro PoE also features IR active illumination in the form of a laser dot projector. It actively illuminates the area in the camera field of view using 4700 laser dots. The OAK-D Pro PoE also features an IR LED flood light to help in low light situations.

### Device Information

| PART NUMBER | SIZE (WxDxH) |
|---|---|
| OAK-D-Pro PoE | 111 mm x 47 mm x 31.1 mm |



*Figure 1 – OAK-D Pro PoE*

# Table of Contents

## 4   Electrical Characteristics

### 4.1  Absolute Maximum Ratings[1]

| SYMBOL | RATINGS | MIN | MAX | UNIT |
|---|---|---|---|---|
| $V_{BUSIN}$ | 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 |
|---|---|---|---|---|---|
| $V_{POE}$ | PoE input voltage range[(2)] | 44 | | 57 | V |
| $V_{BUSIN}$ | 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) Power supply designed according to 802.3af (802.3at Type 1) standard.

## 5 Camera sensors characteristics

### 5.1 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 |

### 5.2 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 | Yes |

## 6   Active illumination

### 6.1  IR dot projector

OAK-D Pro doesn't include IR filter on mono cameras (production version will have notch IR filters at 940nm), which allows only visible light and IR light from illumination LED/laser dot projector to the camera..

Laser dot projector projects 4700 dots in front of the device, which helps with disparity matching, especially for low-visual-interest surfaces (blank surfaces with little to no texture), such as a wall or floor. Technique that we use is called ASV - conventional active stereo vision - as stereo matching is performed on device the same way as on OAK-D (passive stereo). The projector meets the CLASS 1 specification which means no harm can be done with the laser source either to human skin or eye.

| Parameter | Value |
|---|---|
| Projector | Dot-Pattern Infrared Illuminator |
| Projector type | VCSEL (vertical cavity surface emitting laser) |
| Control | Using strobe signal from the left stereo camera (PWM) |
| Compliance | Class 1, IEC 60825-1:2014 Edition 3 |
| FOI (Field of illumination) | HFOI: 61°+/-4°, VFOI: 78°+/-4° |

### 6.2  IR flood illumination LED

Blanket IR LED illumination allows perceiving low-light and no-light environments. You can run your AI/CV processes on frames that are illuminated by the IR LED. Note that color camera doesn't perceive IR light, so you would need to use mono camera stream for your AI/CV processes.

| Parameter | Value |
|---|---|
| Projector | IR Light Emitting Diode |
| Wavelength | 940 nm |
| Control | Using strobe signal from the left stereo camera (PWM) |
| Compliance | IEC  62471:2006 |
| FOI (Field of illumination) | FOI: 80° |

# 7 Connectors

OAK-D Pro PoE features an M12 connector for connecting to host via Ethernet and providing power, and M8 auxiliary connector.
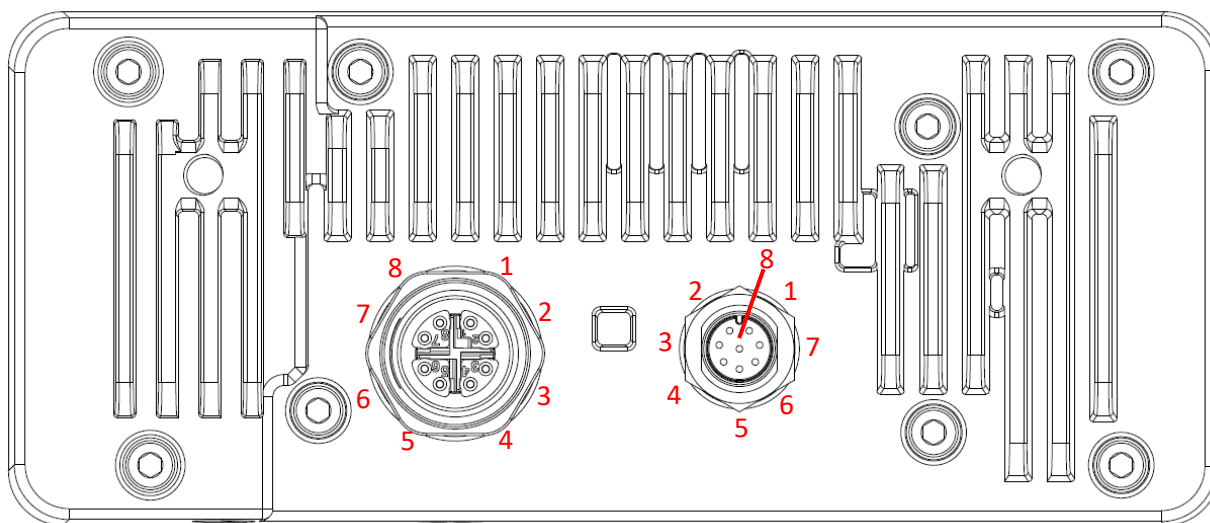


Ethernet M12 connector, X-Coded, Female

| 1 | Ethernet MX0+ |
|---|---|
| 2 | Ethernet MX0- |
| 3 | Ethernet MX1+ |
| 4 | Ethernet MX1- |
| 5 | Ethernet MX3+ |
| 6 | Ethernet MX3- |
| 7 | Ethernet MX2+ |
| 8 | Ethernet MX2- |

Auxiliary M8 connector, A-Coded, Male

| 1 | GPIO / Strobe |
|---|---|
| 2 | FSYNC |
| 3 | USB+ |
| 4 | USB- |
| 5 | 5V input |
| 6 | GPIO |
| 7 | GPIO |
| 8 | GND |

## 8   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.
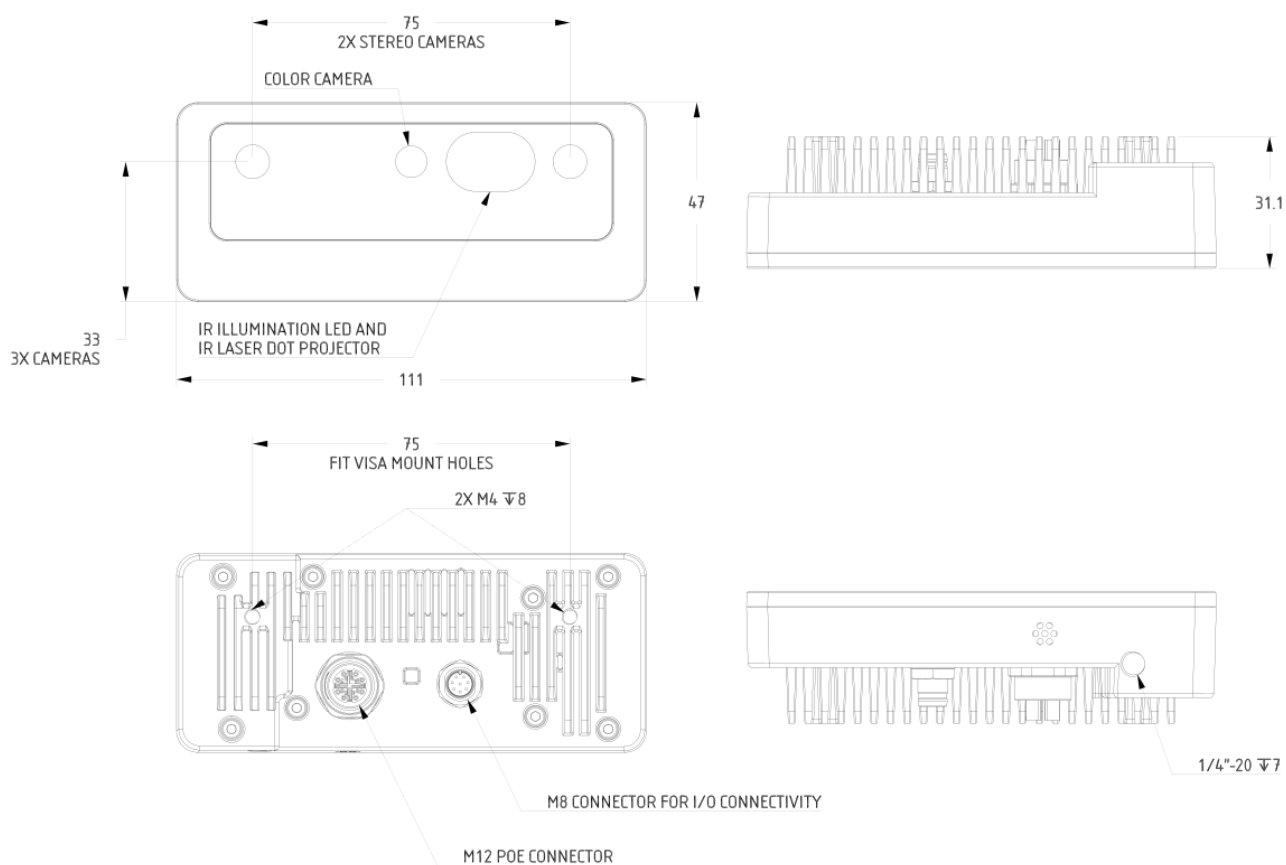


*Figure 2 – OAK-D Pro PoE Mechanical measurements*