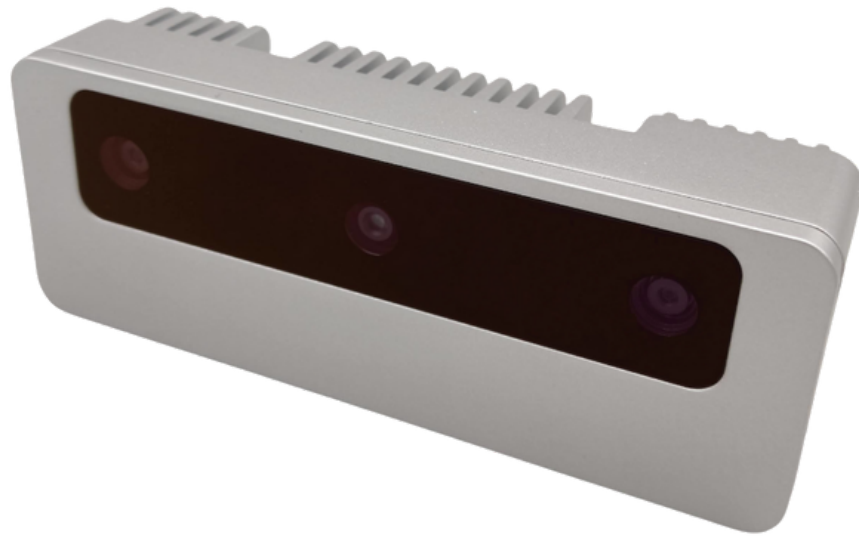




# OAK-D-S2-PoE



## Overview

The OAK-D S2 PoE is the Series 2 version of the OAK-D-PoE. The main difference is that the OAK-D S2 PoE has a smaller enclosure and is therefore lighter.

It also has industrial M12 PoE connector (instead of RJ45) and additionally features M8 connector for IO connectivity; USB2 (D+, D-), camera IOs (FSIN, STROBE), power, and one auxiliary GPIO.

## Hardware Specification

This OAK camera uses Power-over-Ethernet (PoE) for communication and power. It offers full 802.3af and Class 3 PoE compliance with 1000BASE-T speeds (1 Gbps). A PoE injector/switch is required to power the device. It also features IP65 rated enclosure. Future batches (manufactured in June 2023 or later) will have IP67 rated enclosures.

# Camera Specification:

Camera Specs	Colour Camera	Stereo Pair
<b>Sensor</b>	IMX378 (PY004 AF, PY052 FF)	OV9282 (PY003)
<b>Shutter</b>	Rolling	Global
<b>DFOV/HFOV/VFOV</b>	81° / 69° / 55°	89° / 80° / 55°
<b>Resolution</b>	12MP (4056x3040)	1MP (1280x800)
<b>Focus</b>	AF: 8cm - ∞, FF: 50cm - ∞	FF: 19.6cm - ∞
<b>Max Framerate</b>	60 FPS	120 FPS
<b>F-Number</b>	1.8 ±5%	2.0 ±5%
<b>Sensor Size</b>	1/2.3"	1/4"
<b>Effective Focal Length</b>	4.81mm	2.35mm
<b>Distortion</b>	< 1% AF, < 1.5% FF	< 1%
<b>Pixel Size</b>	1.55µm x 1.55µm	3.0µm x 3.0µm

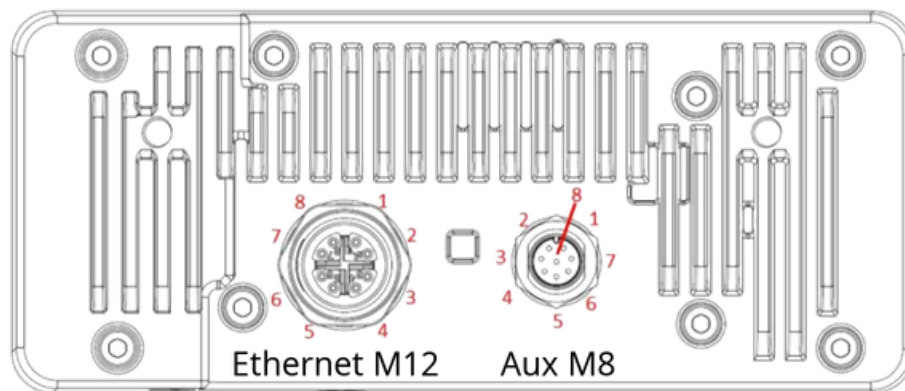
## RVC2 inside

This OAK device is built on top of the RVC2. Main features:

- **4 TOPS** of processing power (1.4 TOPS for AI - RVC2 NN Performance)
- **Run any AI model**, even custom-architected/built ones (models need to be converted)
- **Encoding** H.264, H.265, MJPEG - 4K/30FPS, 1080P/60FPS
- **Computer Vision** warp/dewarp, resize, crop in ImageManip node, edge detection, feature tracking. You can also run custom CV functions
- **Object Tracking** 2D and 3D tracking with ObjectTracker node
- **Stereo Depth** perception with filtering, post-processing, RGB-depth alignment and high configurability

## Connectors

M8 aux connector has 8pin female A-coded connector and the M12 ethernet has 8pin female X-coded connector.

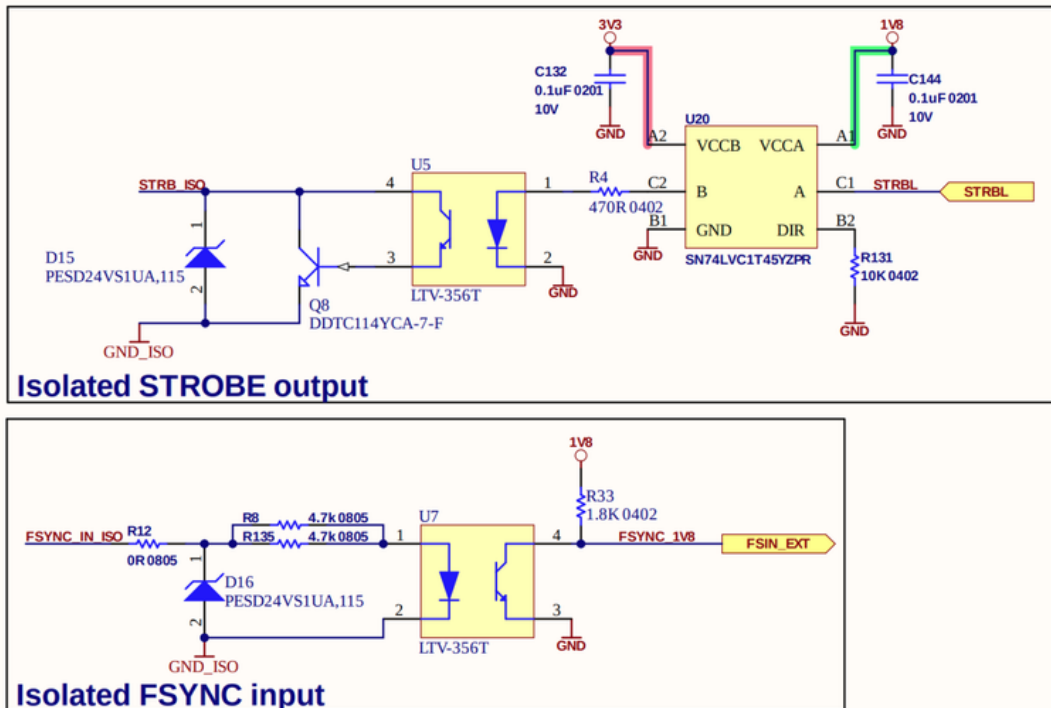


# Connectors

	M12 Pin	M8 Pin	M8 Functionality
1	Eth MX0+	AUX GPIO 3V3	3V3 auxiliary GPIO 52. Pull this pin high with 10k resistor at startup for USB boot.
2	Eth MX0-	FSYNC ISO	Isolated Frame synchronization input signal for cameras
3	Eth MX1+	USB D+	USB 2.0 interface that can be used to connect to the OAK device (eg. reflash) if USB boot is enabled (via AUX GPIO 3V3).
4	Eth MX1-	USB D-	USB 2.0 interface that can be used to connect to the OAK device (eg. reflash) if USB boot is enabled (via AUX GPIO 3V3).
5	Eth MX3+	VBUSIN	This pin is used for sourcing 5V power to accessory devices connected to the M8 connector. If trying to boot the device in USB boot mode, this pin can also sink current.
6	Eth MX3-	Strobe ISO	Isolated Strobe output signal for cameras (Open Collector)
7	Eth MX2+	Isolated GND	Isolated ground for Strobe/FSYNC
8	Eth MX2-	GND	Ground.

## Connectors

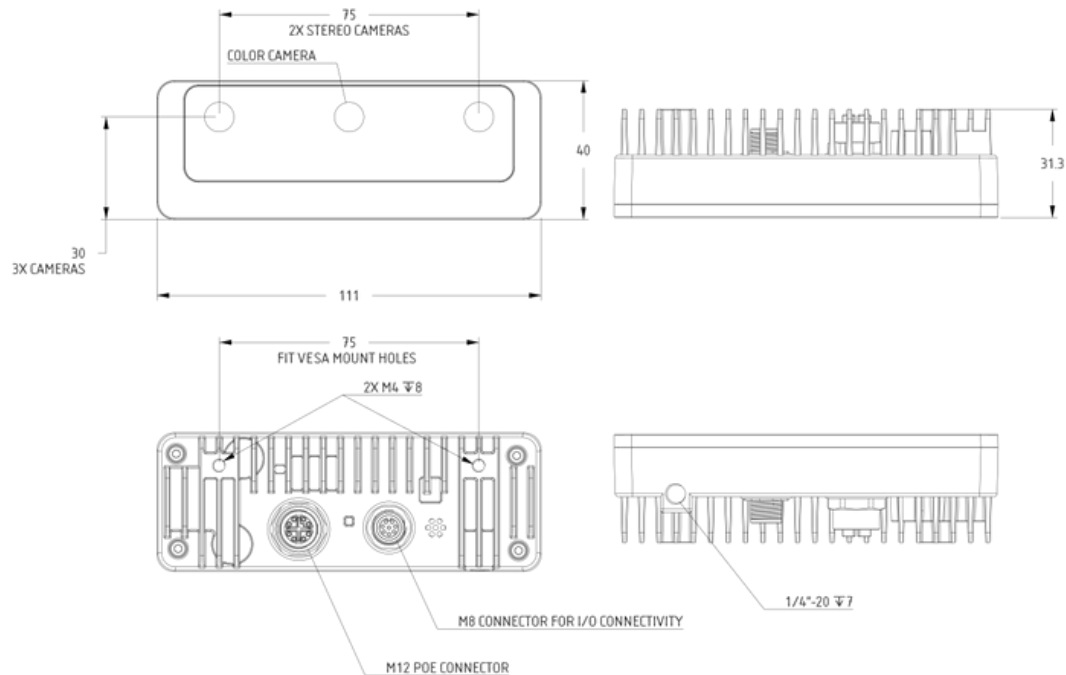
Cameras also include an M8 connector cap for waterproofing in case the M8 connector wouldn't be used.



**External Triggering:** Sensors require 1V8 rising edge on FSYNC for the trigger event. We are using an optocoupler and ESD protection diode, so the input trigger voltage should be 12V (up to 24V) and the trigger logic is reversed, so trigger event happens at 0V on the FSYNC line. For example, see [External FSYNC Example](#).

## Dimensions and Weight

Weight: 91g



## Stereo depth perception

This OAK camera has a baseline of 7.5cm - the distance between the left and the right stereo camera. Minimal and maximal depth perception (MinZ and Max) depends on camera FOV, resolution, and baseline- more information [here](#).

- Ideal range: 70cm - 8m
- MinZ: ~20cm (400P, extended), ~35cm (400P OR 800P, extended), ~70cm (800P)
- MaxZ: ~15 meters with a variance of 10% (depth accuracy evaluation)

Extended means that StereoDepth node has Extended disparity mode enabled.

## Integrated IMU

This OAK camera has an integrated BNO085, a 9-axis IMU (Inertial Measurement Unit). See [IMU node](#) for the API details on how to use it.

Note: due to supply chain issues, most of the OAK camera that were manufactured between Q2 2021 and Q2 2023 have integrated BMI270 - 6-axis IMU instead.

## Operating temperature

This device is rated to withstand temperatures within the range of  $-33^{\circ}\text{C}$  -  $55^{\circ}\text{C}$ . Use in temperatures outside of this range may result in device failure.

## Datasheet

- [Datasheet](#)

## 3D Models

- Board STEP files [here](#)
- Enclosure STEP files [here](#)