OAK-D

Overview

The OAK-D baseboard has three on-board cameras which implement stereo and RGB vision, piped directly into the OAK SoM for depth and AI processing. The data is then output to a host via USB 3.1 Gen1 (Type-C).

Hardware specifications

This OAK camera uses USB-C cable for communication and power. It supports both USB2 and USB3 (5Gbps / 10Gbps).

Camera Specs	Color camera	Stereo pair
Sensor	IMX378	OV9282
DFOV / HFOV / VFOV	81° / 69° / 55°	82° / 72° / 50°
Resolution	12MP (4032x3040)	1MP (1280x800)
Focus	Auto-Focus: 8cm - ∞	Fixed-Focus: 19.6cm - ∞
Max Framerate	60 FPS	120 FPS
F-number	2.0	2.2
Lens size	1/2.3 inch	1/4 inch

Camera Specs	Color camera	Stereo pair
Pixel size	1.55µm x 1.55µm	3µm x 3µm

Myriad X inside

This OAK camera has on-board **Myriad X** VPU ([product pdf](#)). Main features:

- **4 TOPS** of processing power (1.4 TOPS for AI)

- **Run any AI model**, even custom architectured/built ones - models need to [be converted](#).

- **Encoding**: H.264, H.265, MJPEG - 4K/30FPS, 1080P/60FPS

- **Computer vision**: warp/dewarp, resize, crop via [ImageManip](#) node, [edge detection](#), [feature tracking](#). You can also [run custom CV functions](#)

- **Stereo depth** perception with filtering, [post-processing](#), [RGB-depth alignment](#), and high [configurability](#)

- **Object tracking**: 2D and 3D tracking with [ObjectTracker](#) node

Dimensions and Weight
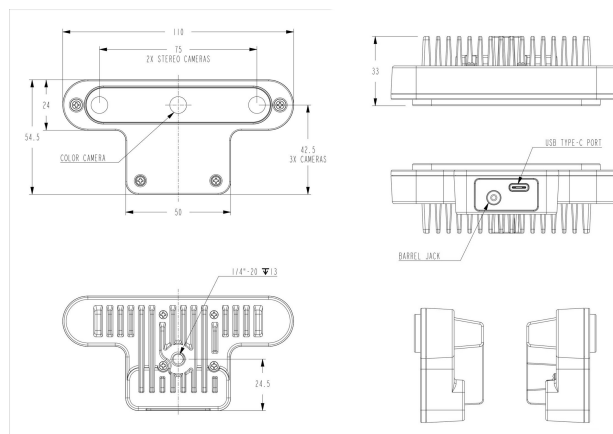
Weight: 115g total, OAK-D-PCBA 43g

Depth perception

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

- Min perceivable distance: ~20cm (400P, extended), ~35cm (400P **OR** 800P, extended), ~70cm (800P)

- Max perceivable distance: ~35 meters

Extended means that StereoDepth node has **Extended disparity** mode enabled, more information <u>here</u>. Maximum perceivable distance calculation <u>here</u>.

OAK-D PCBA

In the past we also sold OAK-D PCBA, which is essentailly an OAK-D without an enclosure and instead has a heatsink. This could still be useful for some applications where size/weight is really critical (eg. drones), and PCBA also exposes some additional connectors.

A. J5 1.8V SPI access	**D.** USB 3.1 Gen1 Type-C
B. J6 3.3V SDIO access	**E.** 5.5mm x 2.5mm 5V PWR
C. J4 AUX IO access	**F.** DepthAI SoM Reset
	G. Indicator LEDs
	H. 5V FAN/AUX header

Getting started

The OAK-D is powered via USB Type-C or from a 5V, 5.5m x 2.5mm barrel jack. USB3 5Gbps speeds are standard for streaming video or data from the device. With cameras and the <u>OAK-SoM</u>, total power consumption usually stays below the 900ma specification of USB 3, but Type-C power of 1.5A or greater is recommended.

Interfacing with the <u>OAK-SoM</u> is also possible with OAK-D connector pads J4, J5, and J6. These pads are designed for the Amphenol/FCI 20021121-00010T1LF or equivalent. Please refer to the schematics for pinout information.

The reset button is not populated by default on the OAK-D, but can be added. Alternativey, the :ref:\`OAK-SoM \`can be reset by shorting RST to ground.

The 5V LED indicates 5V power is present on the PCBA. The PG LED indicates "power good" from the OAK-SoM. The "RUN" LED indicates that the OAK-SoM is not in reset.