OAK-D-CM4 — DepthAI Hardware Documentation 1.0.0 documentation

OAK-D-CM4

Overview

OAK-D-CM4 is based off of the OAK-D-CM3 and it combines a host (RPi CM4) and the OAK-SoM to allow for a fully standalone and integrated solution for real-time Spatial AI.

The biggest difference between OAK-D-CM4 and OAK-D-CM3 architecture is that OAK-D-CM4 integrates a CM4 module, has gigabit ethernet, and is populated with MagJack supporting PoE. PoE can be used with additional PoE Hat. CM4 modules also have WiFi and Bluetooth connectivity.

Most OAK-D-CM4 devices have eMMC memory on-board. If you would like to flash a new image to it, follow the tutorial here. OAK-SoM is connected to the RPi CM4 via USB2 lines (on PCB).

Hardware specifications

Camera module specifications

You can select either **FF or AF** color camera, more information here.

Camera Specs	Color camera	Stereo pair
Sensor	IMX378 (PY004 AF, PY052 FF)	OV9282 (PY003)
DFOV / HFOV / VFOV	81° / 69° / 55°	82° / 77° / 53°
Resolution	12MP (4056x3040)	1MP (1280x800)
Focus	AF: 8cm - ∞, FF: 50cm - ∞	FF: 19.6cm - ∞
Max Framerate	60 FPS	120 FPS
F-number	1.8 ±5%	2.0 ±5%
Lens size	1/2.3 inch	1/4 inch
Effective Focal Length	4.81mm	2.35mm
Distortion	< 1% AF, < 1.5% FF	< 1%
Pixel size	1.55µm x 1.55µm	3µm x 3µm

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-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

Stereo depth perception

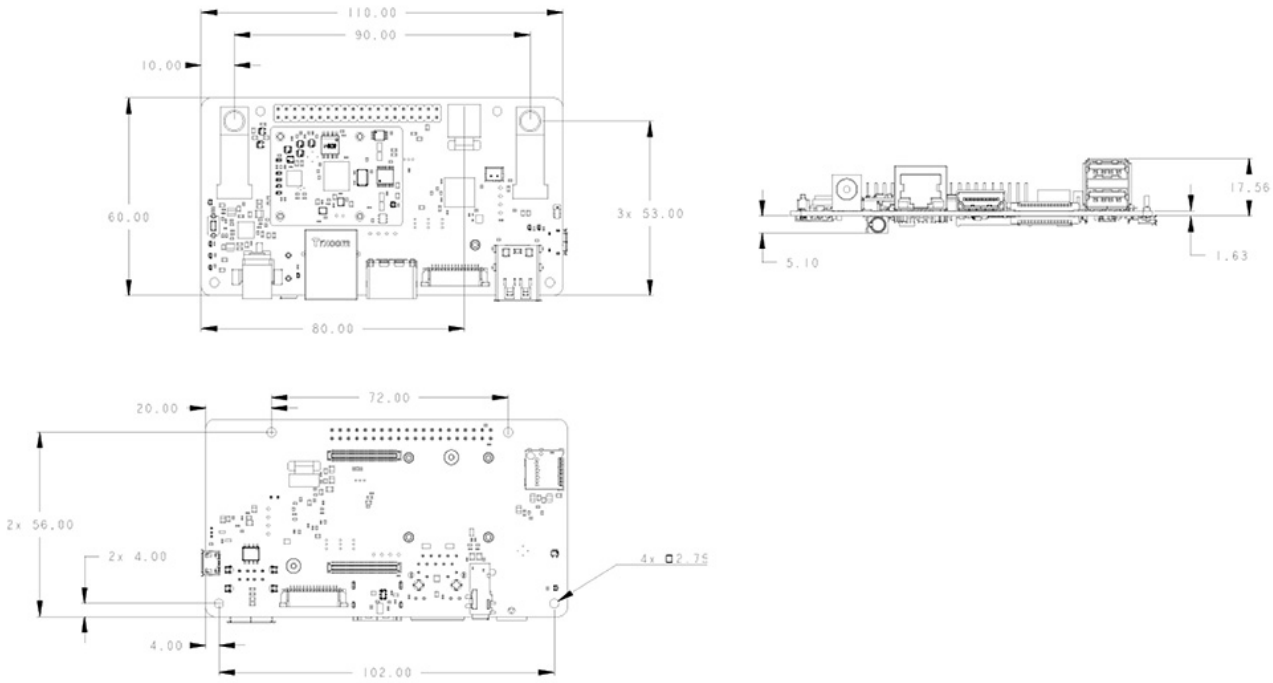
This OAK camera has a baseline of 9.0cm - the distance between the left and the right stereo camera. Minimal and maximal depth perception (MinZ and Max) depends on camera FOV, resolution, and baseline- more information here.

- Ideal range: 85cm - 10m
- MinZ: ~20cm (400P, extended), ~40cm (400P **OR** 800P, extended), ~80cm (800P)
- MaxZ: ~17 meters with a variance of 10% (depth accuracy evaluation)

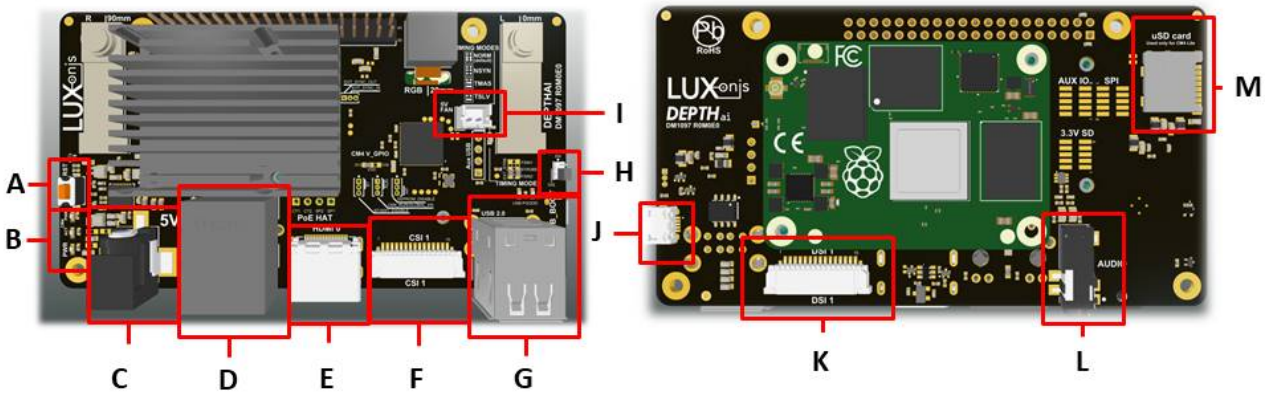
Extended means that StereoDepth node has Extended disparity mode enabled.

Dimensions and Weight

- Width: 110 mm
- Height: 60 mm
- Length: 27 mm
- Weight: 106g



Board Layout



A. DepthAI SoM Reset

B. Indicator LEDs

C. 5.5mm x 2.5mm 5V PWR

D. CM4 Gigabit Ethernet

E. CM4 HDMI

F. CM4 CSI1 Connector

G. CM4 2x USB 2.0 Type-A

H. USB Boot jumper

I. 5V Fan/Aux header

J. CM4 USB Boot

K. CM4 DSI1 Connector

L. CM4 Audio out

M. CM4 microSD card