



OAK-D-Lite



Overview

OAK-D-Lite takes the affordability idea and pushes it one step forward. By having the same SpatialAI functionality as OAK-D with a smaller weight and form factor, it gives you the opportunity to create all sorts of projects.

It is meant to be used by anyone, anywhere. The Swiss Army Knife of Computer Vision.

Hardware Specification

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



Camera Specification:

Camera Specs	Colour Camera	Stereo Pair
Sensor	IMX214 (PY014 AF, PY114 FF)	OV7251 (PY013)
Shutter	Rolling	Global
DFOV/HFOV/VFOV	81° / 69° / 55°	86° / 73° / 58°
Resolution	13MP (4208x3120)	480P (640x480)
Focus	AF: 8cm - ∞ OR FF: 50cm - ∞	Fixed-Focus 6.5cm - ∞
Max Framerate	35 FPS	120 FPS
F-Number	2.2 ± 5%	2.0 ± 5%
Sensor Size	1/3.1"	1/7"
Effective Focal Length	3.37mm	1.3mm
Distortion	< 1%	< 1.5%
Pixel Size	1.12µm x 1.12µm	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 via 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

OAK-D vs OAK-D-Lite

OAK-D-Lite is smaller, lighter and uses less power; compared to OAK-D. The main differences are:

- Mono cameras have lower resolution (640x480 instead of 1280x800)
- Initial versions of OAK-D-Lites (KickStarter batch) had no IMU. Current batches have BMI270.
- There is no power jack, as most users just used the USB-C for power delivery, which provides 900mA at 5V and is enough for most use-cases. However some functions (e.g. inference, video encoding) can lead to large current spikes, so there is a chance hosts like RPi won't be able to provide enough power. In that case, you should use Y-adapter.

Additionally, the more technical differences are the following:

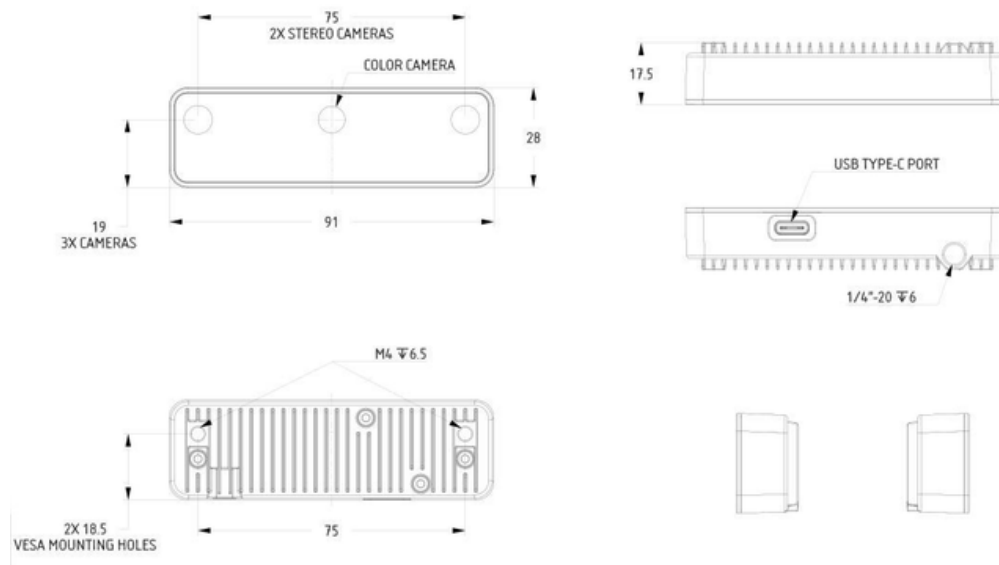
- Robotics Vision Core 2 chip-down design, instead of connecting the OAK-SoM to the baseboard (like it is done on OAK-D)
- In collaboration with ArduCam, we developed custom camera sensor connectors, which are shorter and take up less space

Fixed-focus vs Auto-focus

When ordering the OAK-D-Lite, you can select whether you want Fixed-focus (FF) or Auto-focus (AF) on the color camera. You should select FF if you are mounting OAK camera to something that vibrates. You should select AF when you need things closer than ~50cm to be in focus. More information can be found at [Auto-Focus vs Fixed-Focus](#).

Dimensions and Weight

- Width: 82 mm
- Height: 114 mm
- Length: 32 mm
- Weight: 294 grams



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: 40cm - 6m
- MinZ: ~20cm (480P, extended), ~35cm (480P)
- MaxZ: ~10 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 BMI270, a 6-axis IMU (Inertial Measurement Unit). See IMU node for the API details on how to use it.

Note: due to cost reduction efforts, all OAK-D-Lite cameras backed on Kickstarter do not have IMU on board.

Power consumption

- Standby: 0.6 W
- Running `depthai_demo.py`: 4 W
- Max consumption: 4.5 W

Occasional power spikes of 2W may occur when running videoEncoder and/or Neural Network. OAK-D-Lite can be also powered off of USB3.

Operating temperature

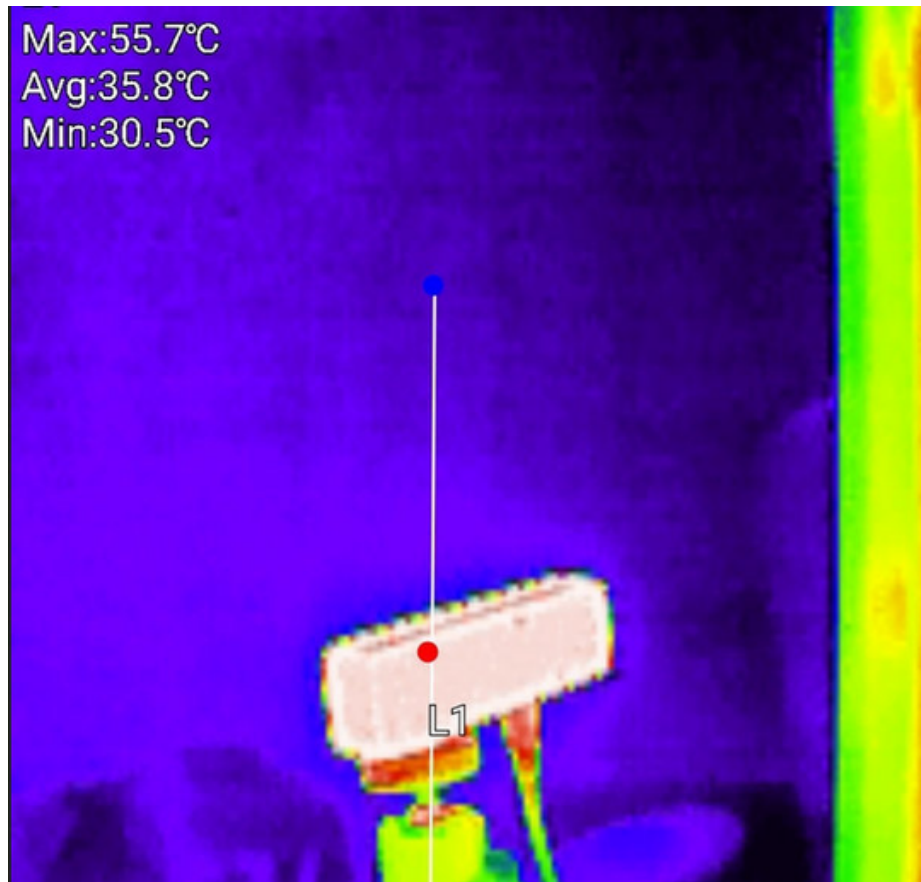
More information can be found at OAK-D-Lite temperature tests. We have tested OAK-D-Lite with the following command which should inflict the highest consumption:

```
python3 depthai_demo.py -enc color -s color left right depth
```

and after 90 minutes, we received the following temperatures:

- Enclosure: 55.7 °C (thermal image below)
- Robotics Vision Core 2: 73.53 °C

The operating temperature range of the Robotics Vision Core 2 (die temperature) is -40 °C to 105 °C. The die temperature can get to about +35°C from the ambient temperature. Note that the stable image temperature of the camera sensor is 0 °C to +50 °C (operating temperature -30 °C to +70 °C).



Datasheet

- [Datasheet](#)

3D Models

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