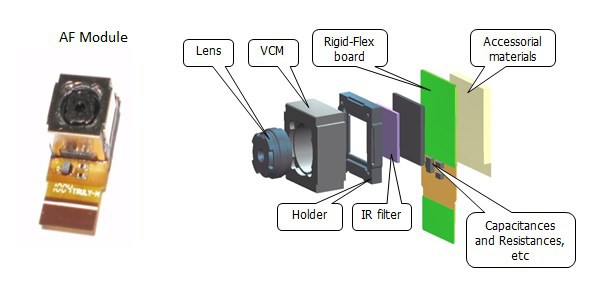
**Introduction**

The Depth-AI camera modules and connectors are a deciding factor in which product makes sense for you. Whether you are developing your own product or deciding which available board to purchase, which cameras that device contains offers tradeoff in flexibility, capabilities, quality, and cost. Before going through options, I will explain a bit more on these modules. To get straight to the options, go to the end of the doc.

Unfortunately, these cameras (and sometimes their connectors) can be the most difficult hardware in a design to procure. The DepthAI team is working hard with Arducam to make more camera options widely available in any quantity (coming soon!). The FFC designs are being modified to match Arducam’s 22 pin interface (which also matches the RPi 22 pin interface) and so are several camera modules (Including M12 mount options). These changes will make life easier for makers and greatly reduce this problem of buying compatible CCMs. More info on that [here](https://docs.luxonis.com/en/latest/pages/faq/#how-do-i-get-different-field-of-view-or-lenses-for-depthai-and-megaai) and in the design comparisons at the end.

**Background and Sourcing**

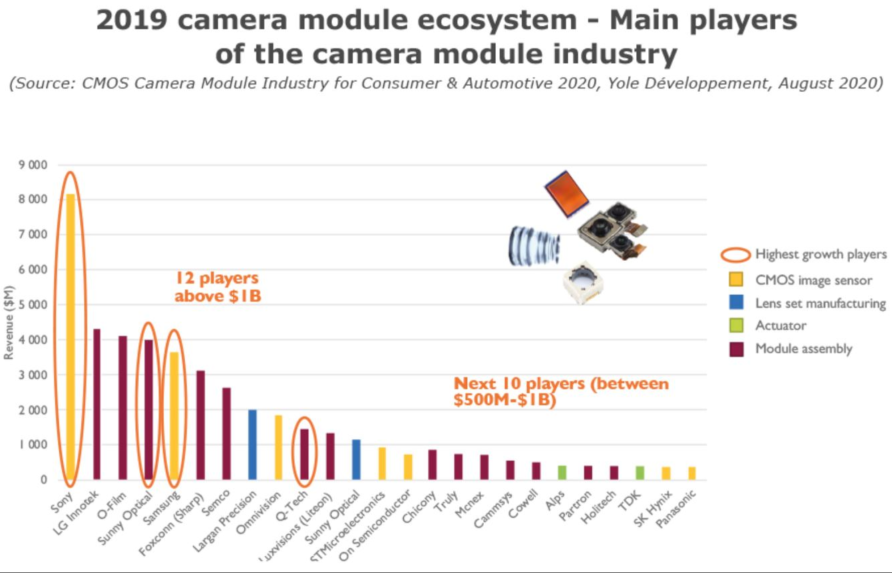
Compact Camera Modules (CCMs) as shown in the picture below, are pcb mounting camera modules that contain a sensor. Making each camera (or really the sensor inside) interface with the Myriad X through the SoM is the value that DepthAI provides you. By using the camera modules/sensors which they have already developed the software stack for, you save yourself 90% of the time involved in making an embedded computer vision device.



*Figure 1: CCM diagram. Each component of the CCM is made by someone other than the camera manufacturer and thus multiple companies often have identical modules. The important part is what sensor is inside the camera, more on that later.*

These CCMs are most used in extremely high-volume consumer electronics and thus can be hard to get in low volume. Many cameras only have one compatible board connector. Others have a couple, but I will do my best to go through each available camera type, its uses, and associated connectors at the end of this document.

Thus, for prototyping purposes, some camera modules have been stocked for low quantity sales by Luxonis. If you plan on moving your product into mid-volume production make sure you have a plan for sourcing. If you reach out to the Luxonis team they will be happy to help you source however they can. Luckily for the open-source community, Luxonis is working with a company to bring CCMs to the consumer market permanently and improve upon the proprietary mess that is the camera industry. While the below may look like a lot of manufacturers, many of these will be unlikely to take a call from you without an order of 10,000 or more.



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Camera | Ref. Designs | Sensor / Compatible SoM | Connector/Source | Cam Type | Other Specs |
| [Sunny Optical AN01V32](https://shop.luxonis.com/products/ov9282-ccm-for-depthai-sunny-an01v32-0jg?pr_prod_strat=copurchase&pr_rec_pid=4706859089986&pr_ref_pid=4706857844802&pr_seq=uniform) | BW1098s  BW1092  BG0250TG | OV9282 // BW1099, BW1099EMB | ACON BBR43-24KB533 (can help source) | Stereo / Mono 1280x800p, 2 Lane MIPI | 120 Hz  83 Deg DFOV |
| [Sunny Optical A12N02A](https://shop.luxonis.com/products/4k-imx378-ccm-for-depthai-sunny-a12n02a?pr_prod_strat=copurchase&pr_rec_pid=4706857844802&pr_ref_pid=4706859089986&pr_seq=uniform) | BW1098  BW1096 OAK-1  BG0249  BW1092 | IMX378 //  BW1099, BW1099EMB | 24-5804-030-000-829 (digi-key) | RGB 12MP  4 Lane MIPI | 4k @ 60 Hz (1080p @ 240 Hz) |
| [Arducam M12 mount](https://www.arducam.com/product/ov9281-mipi-1mp-monochrome-global-shutter-camera-module-m12-mount-lens-raspberry-pi/) ***or*** [CCM](https://www.arducam.com/product/1-4-cmos-ov9281-global-shutter-standalone-camera-uc9281m1-mipi-interface/) | *NEW* | OV9282 //  BW1099,  BW1099EMB | 22 pin FFC Arducam/RPi | Fisheye/Stereo  2 Lane MIPI | 165 Deg DFOV  **(1)** |
| [Arducam M12 Mount](https://www.arducam.com/product/arducam-high-quality-camera-for-jetson-nano-and-xavier-nx-12mp-m12-mount/) or [CS Mount](https://www.arducam.com/product/b0242-arducam-imx477-hq-camera/) | *NEW* | IMX477 //  BW1099,  BW1099EMB | 22 pin FFC Arducam/RPi | RGB 4k 60 Hz  4 Lane MIPI | 60 Hz (1080p @ 240 Hz) **(2)** |
| IMX 2xx | *COMING SOON* | IMX2xx | 22 pin FFC Arducam/RPi | 20MP color |  |

1. – IR Capable Modules available ; **(2)** – Replaceable Lens ;

**COMING SOON:** BW2099 Baseboard, will retain compatibility with all of the above camera modules

[Hyperfocal distance](https://docs.luxonis.com/en/latest/pages/faq/#what-is-the-hyperfocal-distance-of-the-auto-focus-color-camera) – the effective ‘range’ of your autofocusing camera can be important. For the IMX378, that is a bit over 10 feet.

**Design Modularity:**

Using the right connectors and baseboard design, creating a modular setup of the above cameras is quite reasonable. If you are looking to create your own modular design, the [BW2098POE](https://github.com/luxonis/depthai-hardware/tree/master/BW2098POE_PoE_Board) and [BW1096 Oak-1](https://github.com/luxonis/depthai-hardware/tree/master/BK1096_OAK-1_Modular) are great references for what that may look like. Or if you need a quick solution, try out one of those already tested designs!

SoMs

|  |  |  |
| --- | --- | --- |
| BW1099 |  |  |
| BW1099EMB |  |  |
| BW2099 |  |  |

\*\* All modules come with 512MB LPDDR4, inquire for 1GB option