How to build the USB camera

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In order to use the Astrowl Box's Plate Solving feature, you can either:

- Add an EOS > C Mount adapter to the Astrowl Box and screw in a 16mm C Mount lens.
- Either buy the USB camera on https://www.astrowlbox.com or make it yourself by following the instructions below.

1. EOS > C Mount Adapter and 16mm Lens

With this device, you can use the Astrowl Box's sensor as a *Plate Solving instrument*. The Astrowl Box will therefore serve exclusively as a Plate Solver, you will not be able to use the Astrowl Box as an Electronic Assisted Astronomy item, because it will not be inserted in the focuser of your telescope.

So, you need to buy the two accessories below.

The EOS to C Mount adapter ring will replace the EOS > T2 ring that is already installed on the box.
You will then screw the 16mm lens into it (it is important to respect this focal length).

EOS to C Mount Adapter

16mm C Mount Format Prime Lens

Once the adapter and lens are installed on the box, you can point it at the sky and adjust the focus of the lens to get a sharp image. You're ready to launch *Plate Solving* (read the user guide to know how this feature works).

2. Using the USB Camera

The other way to use the *Plate Solving* feature is to plug an USB camera into the Astrowl Box.

If you already have an Astrowl Box, you will need to create a hole next to the network socket on the side of the box, in order to make the USB ports accessible.
Open the box by unscrewing the 4 screws at the 4 external corners of the box, gently lift the cover and unplug the socket which is connected to the small electronic board (ST4) screwed on the inside of the box. Next, you will need to locate the USB ports and cut the cover so that they can be accessed by closing it. It is not necessary to create an opening to make the 4 USB ports accessible, you can limit to 2 ports one above the other.

Then, you can either buy the camera already assembled on the https://www.astrowlbox.com website or make it yourself by following the steps below.

a. Items to buy to build the USB camera yourself

The USB camera sensor **is an IMX662**. It is possible that other USB cameras will work, but the *Plate Solving* tests were carried out with this camera.
You can get this sensor from different sites, like Aliexpress. Ideally, you should buy a model without a lens, as it will need to be replaced by a 16mm lens. If you do a Google search with the keywords 'camera', 'USB', 'IMX662', you will find it.

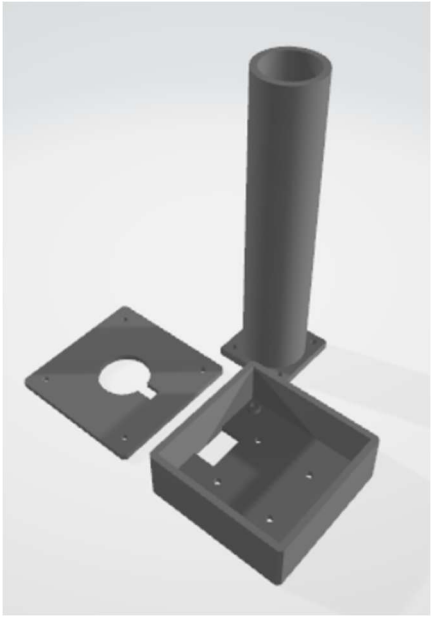
The lens installed is a **16mm lens in M12 format**, as pictured below.

16mm F/2.0 5MP HD Camera Lens, M12 Ultra Wide Angle Prime Lens for CCTV Surveillance

You also need to buy a **laser pointer mount**, which attaches to a mini Vixen mount.

This mount will allow you to insert the USB camera housing and align it with the telescope's focuser, just like a conventional finderscope.

The USB camera housing is made up of three parts. These parts can be made by 3D printing. You can retrieve the STL file that allows you to print these parts yourself on the https://www.astrowlbox.com website, if you have a 3D printer or via online sites.



You will then have to insert the camera into the square part and assemble the different elements with M2 format screws.