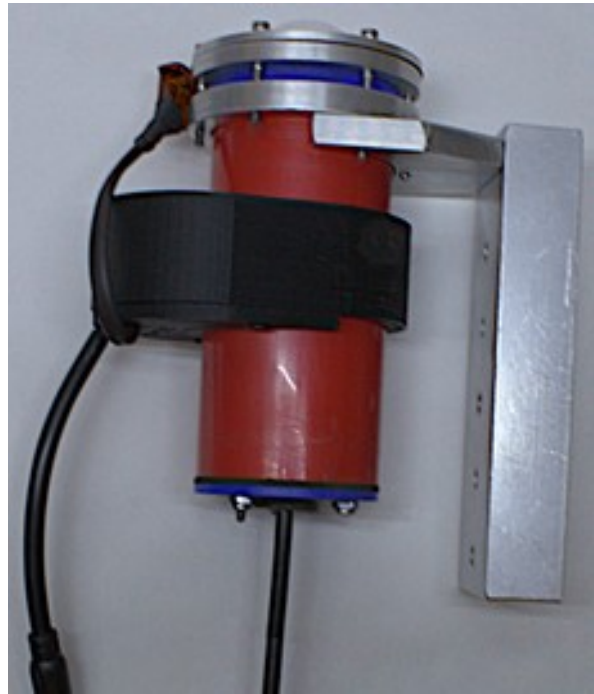# Astra180 USB All-Sky Camera User Manual

Updated: February 7, 2025

https://starsynctrackers.com/files/astra180usb_manual.pdf

Table of Contents

1 About the Astra180 USB

The Astra180 USB Camera is an USB astronomy camera in a enclosure that can be mounted permanently outdoors. It is equipped with a fish eye lens and designed to take wide field images of the the sky.

In order to capture images from the camera, specific software must be installed on the computer to facilitate this process. Please refer to the software section for details on the necessary drivers and software required for this purpose.

The All-Sky Camera is equipped with a ~ 3 watt dew heater. To prevent the camera from overheating and minimize thermal noise, the dew heater is outfitted with an temperature sensor that activates the heater only when temperatures are below ~70F(21C) and off when it is higher than ~80F(27C) hysteresis of ~10F(6C).

1.1 Powering the Astra180 USB

The Astra180 USB's camera is powered by the USB connection itself, while the heater needs a separate DC power with 5 Volts and rated for at least 1.5 Amps.

AC Power Supply: Using a power supply other than the one provided with the camera may result in damaging the camera or heater, as supplying them with more than 5 volts can cause harm. Therefore, it is recommended to only use the power supply that comes with the camera.

The camera's power supply features a weather-resistant connector and comes equipped with a 32-ft low-voltage cable on one end and a 9-ft AC voltage cable on the other.

Outdoor outlets and extension cables: We suggest that you plug the power supply indoors and run the low voltage side outdoors. Electrical codes usually don't allow the use of an outside outlet for more than 90 days. If you have to use an outside outlet, we suggest that you use an in-use cover and a GFCI outlet. You should also check the power supply and cable at least every 90 days to ensure it is not damaged. Pay attention to anything that could damage the cable, such as wind causing it to rub against the building.

To prevent any damage to the low voltage power cable, it's essential to secure it properly. You can achieve this by using conduit, cable runners, and cable clamps to keep the cable in place and prevent it from rubbing against the building. The power supply connector is 0.7" in diameter.

Figure 1: Power Supply that comes with the Astra180 USB. 32ft black low voltage length cable, and 9 ft orange AC length cable.

Figure 2: Connecting power from the supply to camera heater.

1.2 USB Model

The USB camera model is connected directly to a computer using a USB cable, which is plugged into the computer's USB port.
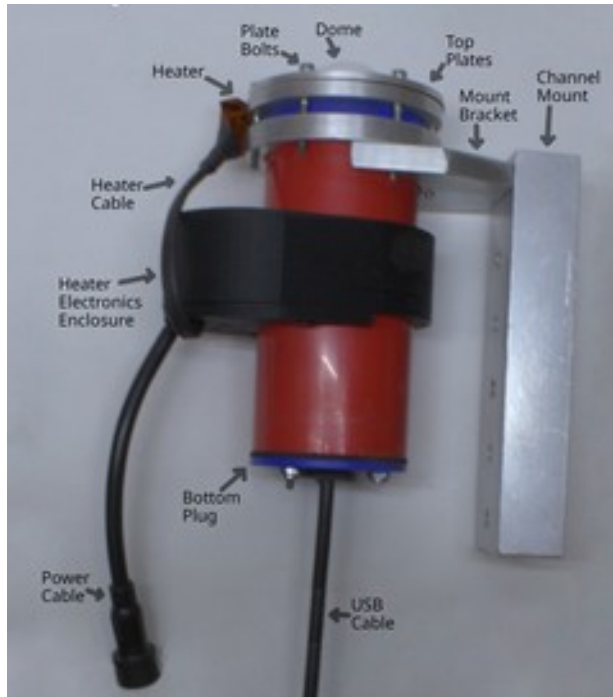

Figure 3: Astra180 USB with parts labeled.   Figure 4: Astra180 USB camera dimensions.

Weight with channel, and without power supply is 2 lbs.

2 Mounting Installation

2.1 Health, Safety, and Disclaimer

Installing the Astra180 USB All-Sky Camera can be dangerous. Use a professional installer if required.

The installation instructions provided are intended as general guidelines, and it is the responsibility of the buyer to possess the necessary knowledge, skill, tools, and awareness of local codes and precautions to ensure a safe and proper installation. The requirements for each installation site may vary, and it is incumbent upon the buyer to take all necessary factors into consideration when planning and executing the installation.

When installing the Astra180 at a high location, it's important to exercise caution. Avoid installing the camera during adverse weather conditions such as high winds, rain, ice, or snow. Before drilling, ensure that there are no wires or pipes present at the designated drill location.

2.1.1 Disclaimer

To the maximum extent permitted by applicable law, liability is limited to the purchase price paid by you for the products purchased from StarSync Trackers LLC, and in no event will StarSync Trackers LLC be liable to you, or any other person, for any indirect, consequential, special, incidental, punitive or other loss or damage, arising from, connected with, or relating to, the sale, installation, or use of products purchased from StarSync Trackers LLC, or otherwise under any theory of liability, whether in contract, tort, strict liability, or any other theory of law and equity, regardless of any negligence or other fault or wrongdoing, including fundamental breach or gross negligence; therefore.

Except to the extent provided above, Buyer does hereby freely and willingly release, indemnify, and hold harmless StarSync Trackers LLC, its employees, members, directors, officers, shareholders, personal representatives, heirs, successors, assigns and agents, from and against any and every claim, demand, right, cause, or causes of action, and losses, costs, damages, expenses, or other injuries of whatever kind or nature arising out of, or relating to, or resulting directly or indirectly from the sale, installation, or use of products purchased from StarSync Trackers LLC.

When purchasing products from StarSync Trackers LLC, the buyer understands that these provisions will cause him/her to be personally liable for his/her act or failure to act during the installation or use of these products.

2.1.2 Security Warning – Location

It's possible to determine the physical location of your All-Sky Camera by analyzing an image captured by the camera. This can be achieved by using the timestamp and location of celestial objects such as the sun, moon, and stars, as well as distant landmarks or visible structures in the surrounding area. If the location of your camera is sensitive information, please be mindful of this before sharing your images or uploading them to the cloud.

2.2 Tools you may need

Many of these items can be purchased at https://starsynctrackers.com but can also be found at home improvement and hardware stores.
- Ladder - Tall enough ladder to safely reach your installation point
- Allen wrench (Hex Key)
- Electrical
  - Electrical Tape
  - Weatherproof in-use outdoor outlet cover - If using an external power outlet, this allows you to keep power plugged in during all weather conditions. (not recommended, recommend running only low voltage power outdoors)
  - Extension cord (not recommended, recommend running only low voltage power outdoors)
  - Extension cord connection protector (Figure 6)
  - Hose Clam
  - Conduit or cable runner.
- Data
  - USB Version: Active USB Extension Cable

- USB Version: Weather-tight USB Connection Enclosure (Figure 5)
- USB Version : Cable Clam
- USB Version: USB Lightning Suppression
- WiFi Version: WiFi signal strength app for your phone
- Mount Hardware
  - One of: J-Pole, Pole, Eave Mount, Roof Saddle Mount, Roof Mount V Bracket, Antenna Mount, Chimney Mount, Overhang Wall Standoff Mount (See images in section 2.5.1 Antenna mounts)
  - Screws and Bolts/Nuts
  - Bubble Level
  - Hose Clamp
  - Mounting bolts
  - Silicon Caulk
  - Flashing Tape
  - Copper Grounding Wire
  - Ground Clamp
  - Ground Rod Clamp

Figure 5: Gel filled protection box. You need to remove a bit of the gel ends for the USB connectors to fit.

Figure 6: Extension cord protector.

2.3 Finding a good installation site

When selecting a suitable location to install your All-Sky Camera, there are several factors to take into account. It's important to note that this list is not comprehensive and other considerations may also apply.

- Sky: You will want a location where the camera has an unobstructed view of a large portion of the sky.
- Mounting Method: Use a pre-existing mount or install a mount like ones listed in 2.2.
- AC Power Outlet: A reasonable distance to AC power.

- Hazards: A place where a hazard cannot damage the camera (such as from a falling tree branch, smoke/heat from a chimney)
- A conduit or other method for the USB cable to go from camera to computer.

2.5 Mounting Astra180 on a pole

For most mounting options, you'll need to install the camera on a pole. You can do this by using the channel mount and hose clamp provided to attach the camera to a pipe with an outside diameter of 1 7/8 inches (such as a 1.5 inch schedule 40 pipe) or larger. If you are using a pipe that is smaller than this, you can drill through the pipe and use the holes in the channel mount to secure the camera.

Figure 8: Astra180 Mounted on a >= 1 7/8" OD pole. Channel straddles the pole. Secured with hose clamp.

Figure 7: Astra180 mounted on < 1 7/8" OD pole. Pole is inside channel.

Also see videos of mounting the Astra180 on a pole:
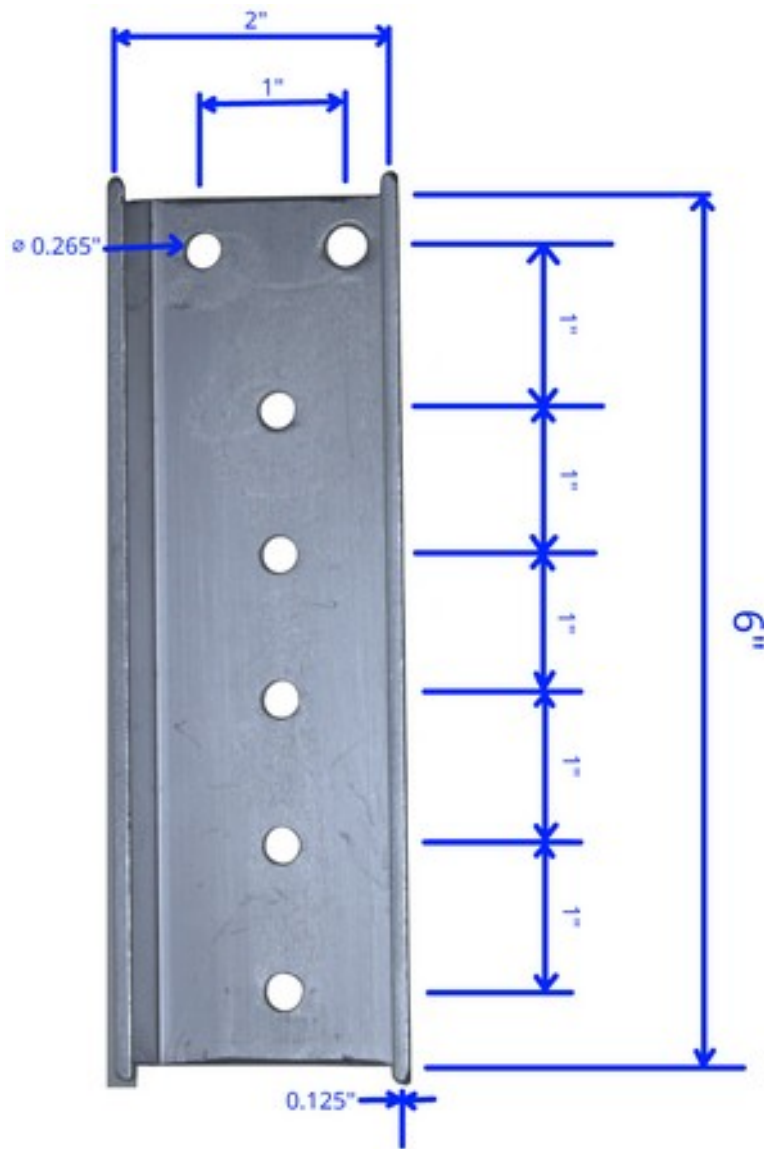- https://starsynctrackers.com/store/video-mountastra180/

Figure 9: Channel mounts dimensions.

Figure 10: 1/4-20 bolts with lock washers connect mount channel and mount bracket on Astra180.

2.5.1 Antenna mounts

Most antennas are installed on a pole. This is convenient as you can use products made for antennas to install your All-Sky Camera. There is a plethora of instructional videos on how to install different antenna mounts. For whichever mount you choose, follow the install instructions for the mount. Make sure the pole is vertical using a bubble level. If required by your building codes, make sure the mount is grounded correctly. Be safe when installing, or when in doubt use a professional. Below are some photographs or drawings of common pole and antenna mounts.
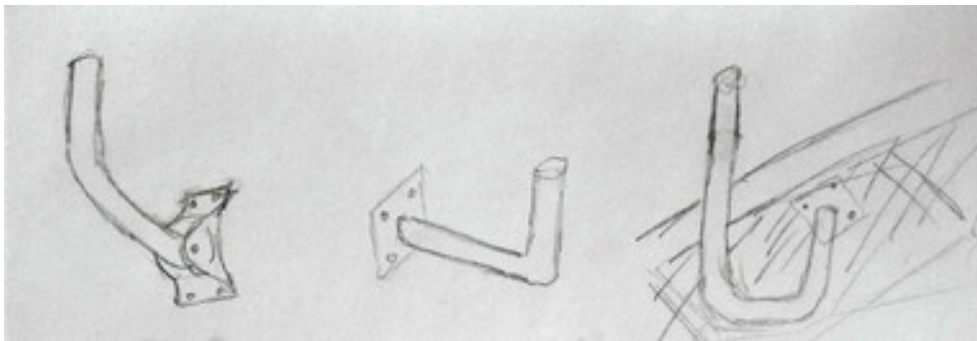

Figure 11: Different types of Wall/J-Pole antenna mounts.
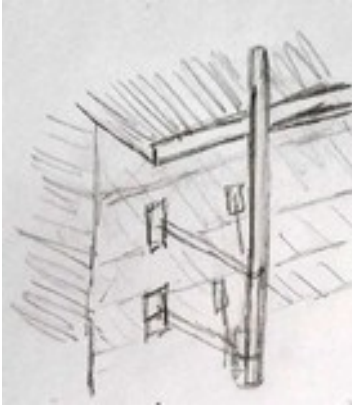

Figure 12: Pole mounted on deck.

Figure 13: Pole mounted using a standoff mount.

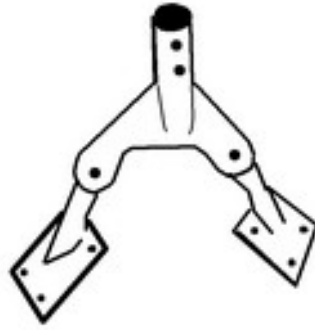Figure 14: Roof Peak/V-Mount Antenna mount.

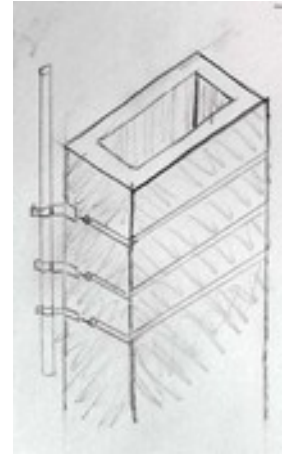Figure 15: Old TV Satelite mount adjusted so pole points up.

Figure 16: Chimney mount.

Figure 17: Pole along wall with no over hang.

Figure 18: Camera mounted at the peak of a roof against the Facia Board using a flat.

2.5.1.1 Informative Antenna Mount Videos

These are not videos we made, but might help if you are trying to install an antenna mount on your own. When in doubt, use a professional.

- https://www.youtube.com/watch?v=pSKOVYFPGuo – Tyler the Antenna Man, goes through different antenna mounts. This can give you a good idea of what options are available for you and your situation.

- https://www.youtube.com/watch?v=6JBzxHRTOV4 - Scott from Everyday Home Repairs, shows several good tips when mounting on a roof. It has good ideas about how to run cable and mounting something on a roof so it doesn't leak.
- https://www.youtube.com/watch?v=c7CQjCMglEU - Mike from solid signal, shows how to install a J-Mount.

3 Software

Inside the All-Sky Camera is a USB3 astronomy camera, either a Player One Ceres-C camera which uses the IMX224 sensor or QHY5III462 C which users the IMX462 STARVIS CMOS sensor.

Note: We are not affiliated with Player One or QHY, we just purchased their cameras to pre-install into our product.

3.1 USB Drivers

You will need to install software on a computer that the camera is connected to. More information on drivers available for the camera could be following links:

- Player One: https://player-one-astronomy.com/service/software/

- QHY: https://www.qhyccd.com/download/

Also see 3.3 Software Links section for more software options.

3.2 Software Links

This list of software options is not comprehensive, but here are some links to software that you may find helpful. Please note that StarSync Trackers LLC is not affiliated with the individuals or companies that develop the software listed below. We also wrote a article about All-Sky Camera Software at https://starsynctrackers.com/store/top-all-sky-camera-software/ .

3.2.1 All-Sky Camera Specific

- allskyeye - https://allskeye.com/
- indi-allsky - https://github.com/aaronwmorris/indi-allsky

3.2.2 Other

- MaximDL - https://diffractionlimited.com/maxim-dl/
- FireCapture - http://www.firecapture.de
- SharpCap - https://www.sharpcap.co.uk/
- KStars - https://apps.kde.org/kstars/
- Player One Drivers - https://player-one-astronomy.com/service/software/
- QHY Drivers - https://www.qhyccd.com/download/
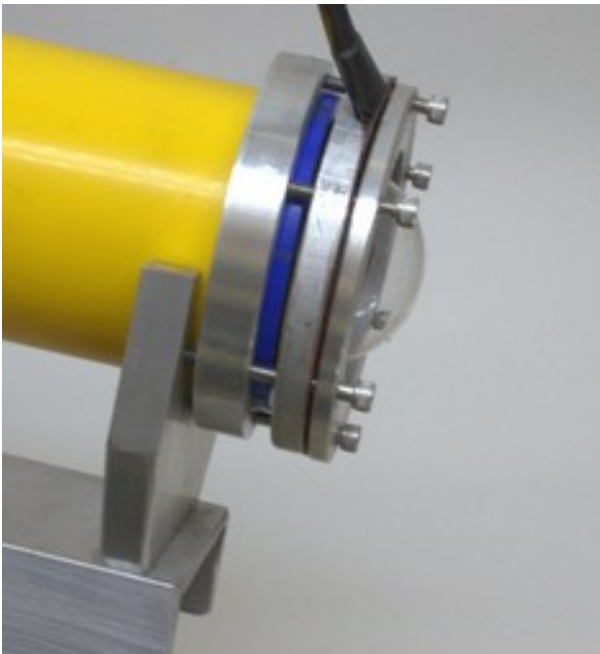
4 Troubleshooting

4.1 Replacing acrylic dome

We sell replacements for the acrylic dome. The following tools are required to replace the dome.

- 7/64 hex key

- Two replacement gaskets.

To be safe it is best if you bring down the All-Sky Camera so you can work on it from the ground.

Loosen and remove bolts on the top with the hex key.

Figure 19

Remove the top plate, heater, middle plate.

Remove the dome and top and bottom gaskets.

Figure 20

Take new dome with one gasket under the dome and one on top.

Place back on the middle plate, heater, and top plate. Make sure groove in middle plate is facing down.

Ensure that the mounting bracket is on the same side as the bottom plate's three pass-through holes. The mounting bracket features threaded holes that secure the plates in place.

Alternate tightening the bolts in a repeating pattern alternating sides so the plate presses down evenly. If using a power drill make sure you have it on the lowest torque setting.
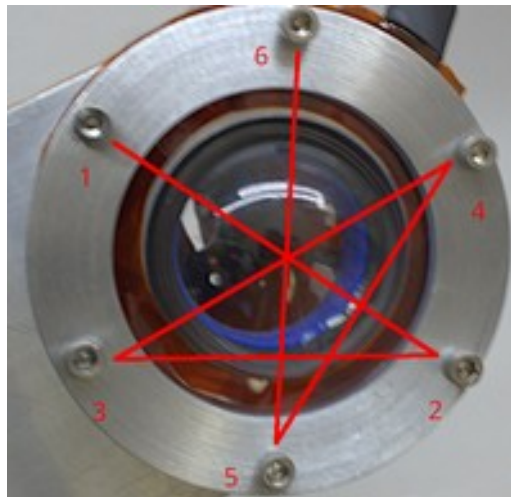

Figure 21

4.2 USB: Computer doesn't find camera.

The camera can function with either USB2 or USB3, but it's important to ensure that your computer's USB port provides enough power for the camera. Some USB ports, particularly those on the front panel of a desktop computer, they may not supply enough power. If you encounter this issue, you can try

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using a different USB port. If problems persist, you may want to try using a USB3 port, if available, or consider using a powered USB hub. If using a USB extension cable, make sure it is an active USB extension cable.