Thank you for your recent purchase of the ASG Electronically Assisted Tilt (EAT) Photon Cage. We highly recommend you walk through and read these instructions thoroughly and understand the device before you begin. Any questions, please email.

Quick Start Guide

Assembly

The Photon Cage will come assembled as a unit. If you have filter sliders or other accessories, you may need to mount those as necessary. Filter wheels can be mounted prior to installing a camera and you should pay attention to the depth of EFW screws going through the cage into the camera area. Any screw too tall should be swapped for a shorter screw as the camera must be able to sit flush in the device without obstruction or hitting a screw end.

Camera Installation

Important to follow these steps to get a good reference starting point.

1. You may optionally remove the top 4 screws holding the upper camera ring if needed to make installation, and especially uninstallation of a camera easier.
2. Slide camera into the device, we recommend aligning the long edge of your camera to the clamping slot. It's not necessary, and you may rotate 90 degrees if needed for OAG alignment, etc.
3. There is a tight gasket, you must push the camera through the last 5mm. You may have to gently rotate and roll the camera until you feel it slide down into this gasket and bottom out.
4. Be sure to bottom out the camera all the way down. The cage will come bottomed out as well, so we want it to be as deep as possible and referencing this zero point to start with.
5. Clamp the camera ring, reinstall the top ring if you uninstalled and clamp it as well snuggly. Nothing needs to be over torqued. The upper ring is designed to save weight yet provide full support.
6. Cable management is provided but not required. We recommend you try not to bend or severely tug on the 4 cable/motor connectors. If using the cable managers on the side, do not tighten down, be sure cables move freely so the device may move freely between the bottom and mid-plates.

USB & Power Requirements

The device is powered by standard 12 volt supply common on astronomy mounts and power supplies. USB can be ran to a USB hub, power box USB port, or directly to your windows machine for connectivity.

Important Note: Always have USB connected first or last. Plug in USB port THEN you can plug in or turn on the 12v power supply to start the unit. When powering down, remove 12v power plug or shut down power THEN unplug USB last.

While using a power box such as UBPv2 or UBPv3, it is best practice to leave the USB port always powered on so the computer is actively managing the system. Power can be engaged/disengaged safely to run the motors this way.

Heat buildup can occur, so we highly recommend a power box to be able to simply turn power ON/OFF as needed, just remember to always have USB running & connected so the computer is active when doing so.

Windows Software Download

We will publish new software and downloads directly on the product page of our website under the downloads tab. https://www.asgastronomy.com/store/asg-electronically-assisted-tilt/
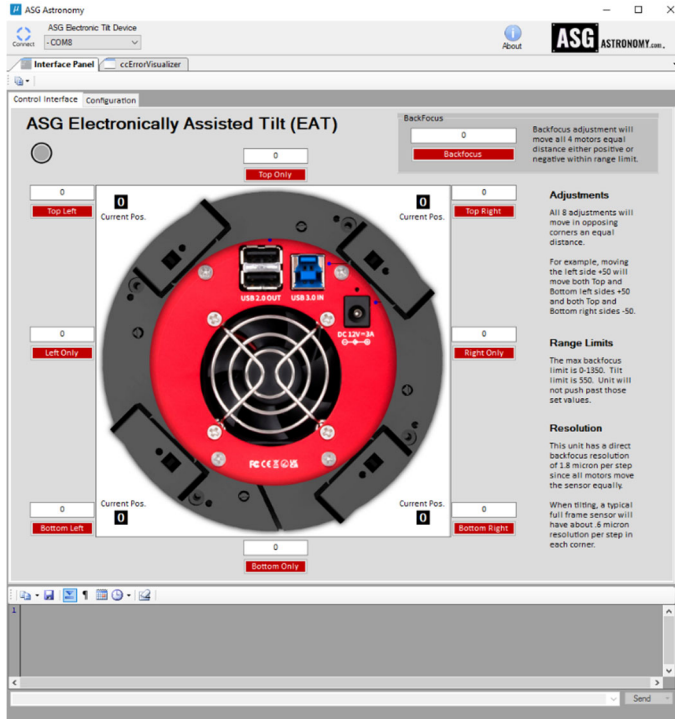
Connecting the Device

Simply choose the COM port and click '**Connect'**. It should recognize this device once plugged into windows.

Control Interface

Two tabs exist, the control interface for doing basic movements and the Configuration tab.

Console Display:

The console display at the bottom shows device operations and various data of operating. A Green/Red indicator light shows red when busy moving, green when ready for input.

Configuration Panel

Here you may rotate the display of the device in refence to the corners. This can help if you need a corner to represent a different alignment. By default, the clamp slot is referenced as the bottom of the image, but it may not always be the case.

Other useful commands here are 'Zero Motor Positions' which is handy if you must start from scratch, or simply change all inputs to a neutral 0 zero number. This process does not move any motors, it simply zeroes the position in the computer.

Speed, Max Speed, and Acceleration can be left at defaults. Currently no range limits are set, but we may build that into the future.

Initial Movement

The device comes completely bottomed out, and so should your camera when installed. The initial movement should be '**Backfocus 550'** and this will move all 4 motors back approximately 1mm.

We highly recommend you try to stay in this area. You can back the camera back 1mm or 1.5mm max or move it in as needed, but it should not be used for more than ~2000 steps or you will pull the camera so far back that it will unset springs or camera will pull from the light gasket.

Important note: Do not run backfocus out more than ~**2000** steps. If you need that much movement, we recommend you readjust your optical train with spacers to get more precise and within the target zone. We have not set limits here initially, so take care of this.

The EAT Photon Cage is <u>3mm</u> thick and we recommend +<u>1mm</u> initial backfocus!

Running First Tests

Being new, and having just installed it to initial setup, you may want to put your camera into a 2 second loop and adjust or rough in the device tilt. Here is how the device works.

You need to make a tilt adjustment to the left side, so you input 50 and click 'Left Only' and it will move both left motors OUT 50 steps, and the right side moves IN 50 steps equally.

You need to make a tilt adjustment to the top left corner, so input 25 and click 'Top Left' and it will move the top left motor OUT 25 steps, and the Bottom right will move IN 25 steps to keep it at same location.

Only one adjustment needs to be made, and it will compensate the others accordingly.

Backfocus will adjust all 4 motors equally IN and OUT accordingly. Positive numbers move OUT, Negative numbers will move IN.

Limits

Try to observe basic limits here. Backfocus will move approximately 1.8 microns per step. 550 steps is equal to approximately 1mm. Tilting is half that since we are rocking the sensor from a central point… so approximately .6 microns for a full frame sensor.

Backfocus range/limit: Try to stay within the 0-2000 range here. Under 1500 is even better.

Tilt range/limit: Try to keep within a 550 differential between sides. Not always possible, but if you must go over 1000 steps on opposing corners, something else is likely wrong!

Power Suggestions:

The device is designed to save to memory after every movement, so losing power, it should boot and remember last position. We do offer saving to EEPROM and loading, but it is not necessary. If possible, we recommend running power from a switchable 12v power supply such as a power box so when not in use, you are not feeding 12v to the motors. This may increase longevity and produce less heat when not needed 99% of the time. <u>Always have USB connected before powering and after powering off.</u>

Hocus Focus:

With HF, I have found when it suggests sensor modeling movements, they can be followed closely with a 1:1 ratio. If it suggests moving Top Left 12 steps, I use that as a guide, and it does fairly well. All things considered you have correct focuser step size input.

Visit Website: www.asgastronomy.com

Need Support? Join our Facebook group or send us an email: sales@asgastronomy.com