

Wanderer FETA M92

Focuser & Electronic Tilt/Back Focus Adjuster

User Manual (2026.8.23)



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1. Introduction

Wanderer FETA M92 is an innovative electronic focuser and tilt (or back focus) adjuster that allows users to accurately and automatically adjust the camera's focus, tilt, and back focus.

The specifications of the Wanderer FETA M92 are shown in the table below:

Power	12V 1A (10-15V allowed)
USB	USB2.0 Type-C with screws
Weight	750g
Telescope Side Connection	M92*1 female threads or bolted connections
Camera Side Connection	M92*1 female threads or bolted connections
Payload	≤8kg
Back Focus(Focuser Travel) Occupancy	15mm between the mounting surface of M92*1 Female Threads on both sides (See Figure 1); 20mm total thickness
Travel	4mm
Steps per Millimeter	236467
Effective Positioning Accuracy	0.2μm
Zero	Fixed mechanical zero; Can be calibrated automatically
Operating temperature	-30°C -50°C

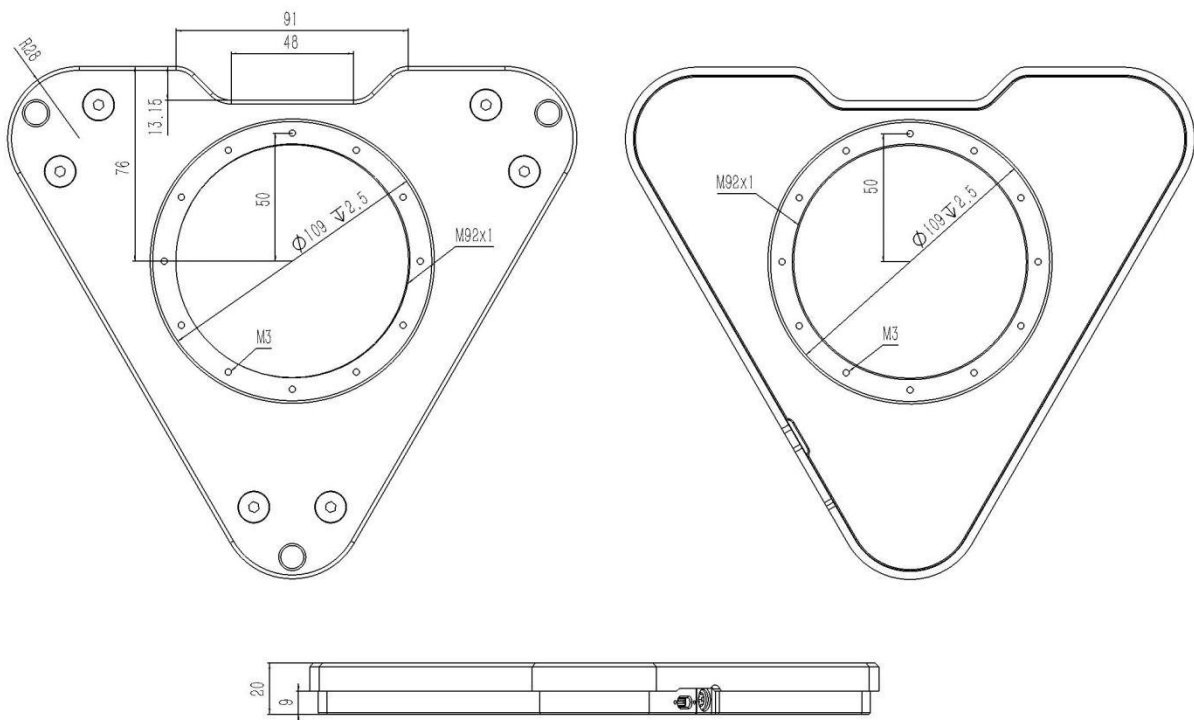
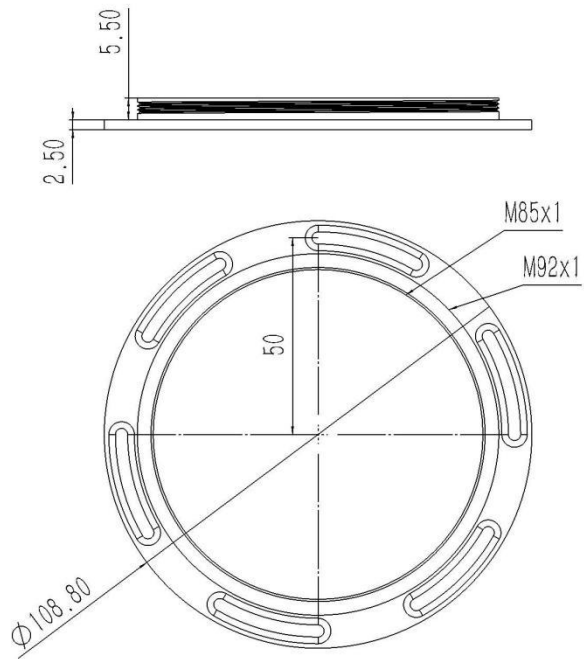


Figure 1

Included Adapter 1

(It turns either side of FETA M92
to M92 male or M85 female)



Included Adapter 2

(It turns either side of FETA M92
to M85 male)

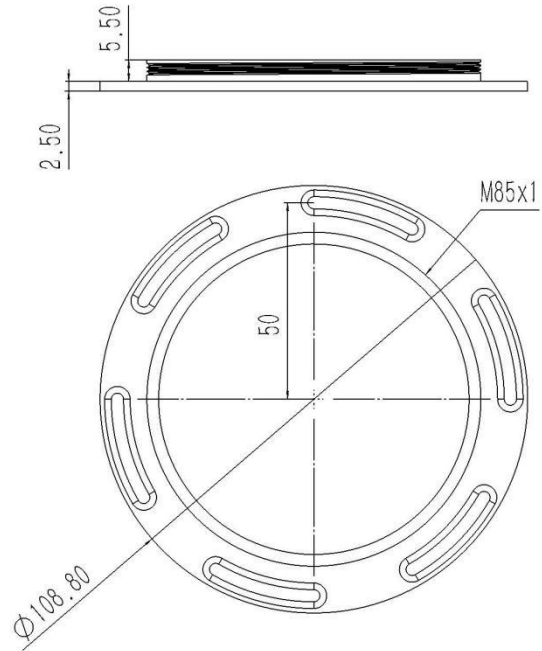


Figure 2

2. Installation

The Wanderer FETA M92 features a lightweight and ultra-thin design, making it suitable for a wide range of telescopes, from small petzval refractors to large scientific reflectors. The FETA M92 supports a payload of up to 8 kg, calculated with the center of gravity located 100 mm from the FETA M92. The FETA M92 features both threaded and bolted mounting options on both sides, providing flexible and secure installation for a variety of telescope configurations. The connection interfaces on both sides are identical. However, when using the ETA as an electronic tilt adjuster, **you must still distinguish between the Telescope Side and the Camera Side during installation**, which is labeled on FETA M92.

2.1 Threaded Connection

Both sides of the Wanderer FETA M92 are equipped with an $M92 \times 1$ female thread. The maximum allowable thread engagement is 7 mm. If the M92 male thread of your accessory is longer than 7 mm, you must use appropriate spacers to limit the thread engagement to 7 mm or less.

When calculating the back focus, please note that the distance between the M92 mounting surfaces on both sides is 15 mm, rather than the FETA M92's overall body thickness of 20 mm. This is because each M92 mounting surface is recessed by 2.5 mm from the main body (Figure 3). However, if the outer diameter of the stop ring on your M92 male-threaded accessory is larger than 109 mm, you need to include that 2.5mm when calculating. Please refer to the dimension drawing for details.



Figure 3

2.2 Bolted Connection

Both sides of the FETA M92 are equipped with twelve M3 threaded holes. The maximum allowable screw engagement is 5 mm. These mounting holes allow you to install custom adapters on either side of the FETA M92. Please note that the surface containing the M3 mounting holes is recessed by 2.5 mm and has an outer diameter of 109 mm. Please refer to the dimension drawing for detailed measurements. WandererAstro also provides a lot of optional bolted adapters for you to connect to different systems:

2.3 Included M92 and M85 adapters

FETA M92 includes two adapters in the package.

One allows you to convert either side of the FETA M92 to an M85 male thread. Simply secure the adapter with the M3 screws provided in the package. You can adjust the rotational angle at which the adapter is fixed, allowing you to control the final orientation of the device when tightening the threaded connection.



Figure 4

The other adapter allows you to convert either side of the FETA M92 to an M92 male thread or an M85 female thread. When used as an M92 male adapter, secure the adapter with the provided screws. When used as an M85 female adapter, thread the M92 male thread on the adapter into the M92 female thread on the FETA M92 body. You can also secure the adapter with screws, just as you would when using it as an M92 male adapter, but this will add an extra 5.5 mm to the back focus.

Both adapters have an effective thickness of 2.5 mm, which fits into the recess of the FETA M92 body. This means that when both two adapters are installed, the effective back focus of the FETA M92 is 20 mm.

2.4 Optional Adapters

Optional adapters are available for Moravian C3, C4 and C5 systems, Takahashi Epsilons, and other optical systems, making it easy to integrate FETA M92 into your existing setup. More mounting solutions are continuously under development.

The following is a list of available optional adapters by the release of FETA M92. Please visit our website for the latest available adapters.

[Bolted M68 Female Adapter for Wanderer FETA M92](#)

[Bolted M72 Female Adapter for Wanderer FETA M92](#)

[Wanderer FETA M92 Bolted Adapter for Moravian C3 M68 Adapter/OAG MKII](#)

[Wanderer FETA M92 Bolted Adapter for Moravian C5 M85 Adapter/OAG MKII](#)

[Wanderer Saddle Replacement Kit for Takahashi Epsilon E130](#)

[Wanderer Saddle Replacement Kit for Takahashi Epsilon E160](#)

[Wanderer FETA M92 Adapter Kits for Takahashi Epsilon 180](#)

[Wanderer FETA M92 Adapter Kits for Takahashi FSQ106](#)

3. Software

3.1 Install WandererEmpire

Visit the official website [WandererAstro](https://wandererastro.com) to download the WandererEmpire software (Figure 5).



Figure 5

3.2 Connect to Wanderer FETA M92

After installing WandererEmpire, double-click to open the software. In the left-side menu, select the "Wanderer ETA" option (Figure 6).

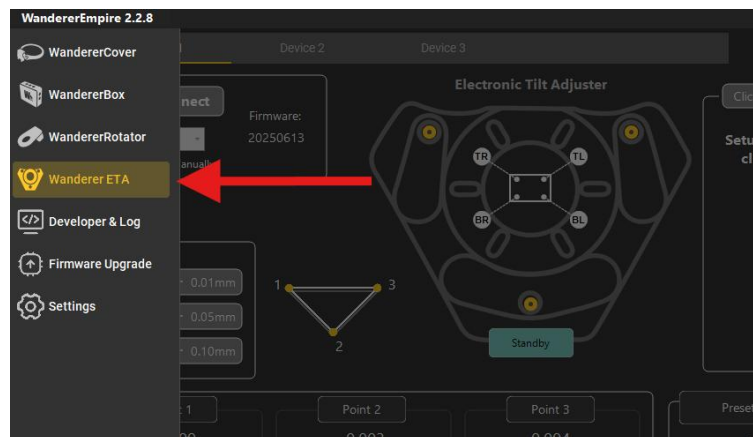


Figure 6

At the top of the interface, you will see options labeled "Device 1," to "Device 6". This indicates that WandererEmpire supports simultaneous connections for up to 6 Wanderer FETA M92s. If you need to operate more than 6 FETAs on a single PC, please contact us (Email: info@wandererastro.com, Frank Wang).

If you know the COM port of the FETA M92 (the COM port can be found in Device Manager; Wanderer devices have a CH340 suffix), select "Select COM Manually" and choose the COM port from the dropdown menu on the left (Figure 7).

If you are unsure which COM port to select, deselect "Select COM Manually" and click Connect. WandererEmpire will sequentially search for the COM port and connect automatically.

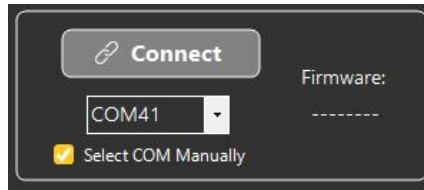


Figure 7

3.3 Control Interface Overview

Please refer to Figure 8:

At the top of the interface, there is a visualization of the current status of the FETA M92, helping users make judgments during adjustments.

On the bottom left of the interface, there are controls for three adjustment points. Points 1, 2, and 3 correspond to the numbered indicators on the FETA M92. You can click the buttons to roughly control the movement of the adjustment points or enter a target millimeter value and click the "Goto" button. The minimum input resolution supported is 0.001 millimeters, and the input range is 0-4 millimeters. You can also click the "Zero" button to quickly return the adjustment points to 0mm.

On the right, there are five sets of customizable presets. You can enter custom preset names, such as "East," "West," etc., to record the corresponding tilt values of the FETA M92 at different orientations of the telescope. Click  to record the current values of the three adjustment points for future use. Click  to move the FETA M92 to the preset values for the three adjustment points.

On the bottom right is the focuser control section. It shows the current equivalent position, which is essentially the average position of the three adjustment points. It also shows the available travel. When the positions of the three adjustment points are the same, the available travel reaches its maximum. The more the device is tilted, the less travel is available for the focuser. This is because the focuser and tilt adjuster share a maximum total travel of 4 mm.

The upper-right corner is designated for the automatic tilt adjustment feature. Please refer to the Chapter 4 for detailed information about this function.

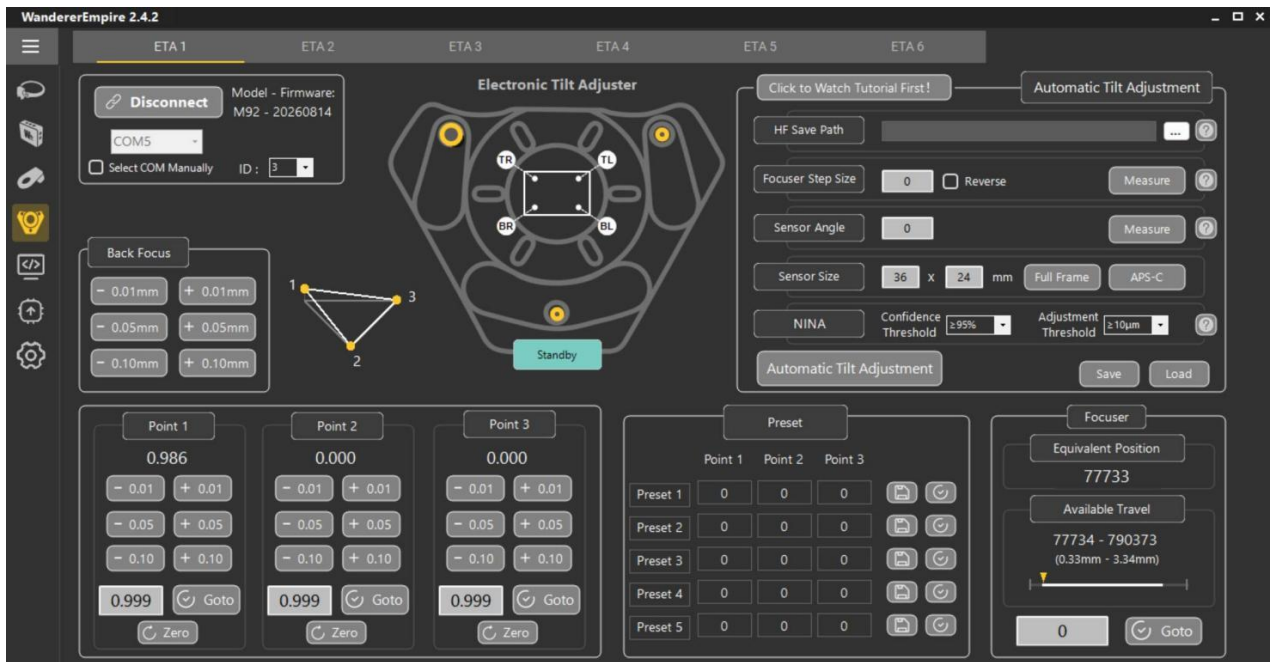


Figure 8

3.4 ASCOM Focuser Driver

By installing the WandererEmpire software mentioned in the previous section, you have also installed the ASCOM focuser driver for FETA M92. Taking NINA as an example, you can find Wanderer FETA M92 (1) – (6) in the Focuser section, corresponding to Device 1 – 6 in the WandererEmpire software(Figure 9). Select the driver and click Connect. Before doing this, please make sure that the device can be connected successfully in WandererEmpire.

Please note that the focuser position of the FETA M92 in ASCOM is divided by 10. Therefore, it is normal for the position to be displayed as 10,000 in WandererEmpire but 1,000 in ASCOM.

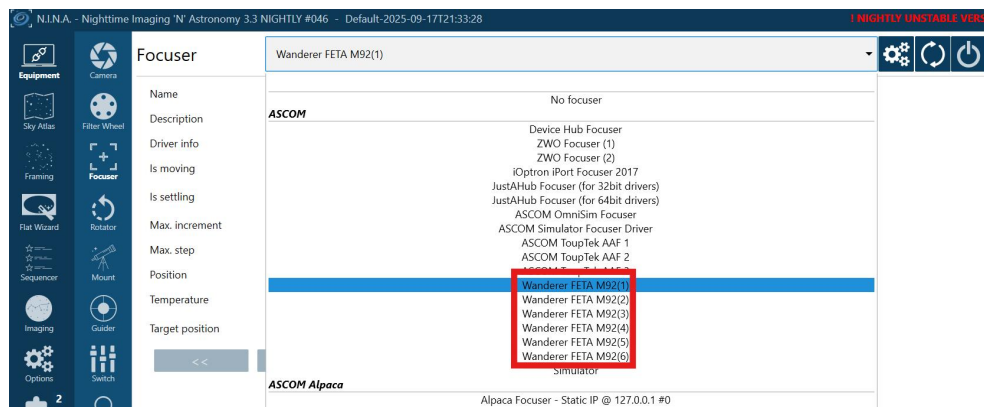


Figure 9

4. Automatic Tilt Adjustment

Please note that due to the limitations of the optical system itself, the FETA M92 can only correct tilt; it does not guarantee perfect star shapes because it is also affected by the collimation of your telescope.

[Video tutorial for automatic tilt adjustment](#)

4.1 Configuration

Automatic tilt adjustment is only available in NINA and requires the Hocus Focus plugin to be installed. After installing the plugin, go to NINA > Options > Imaging > Image Options and change the settings for Star Detector from the default "NINA" to "Hocus Focus". (Figure 10)

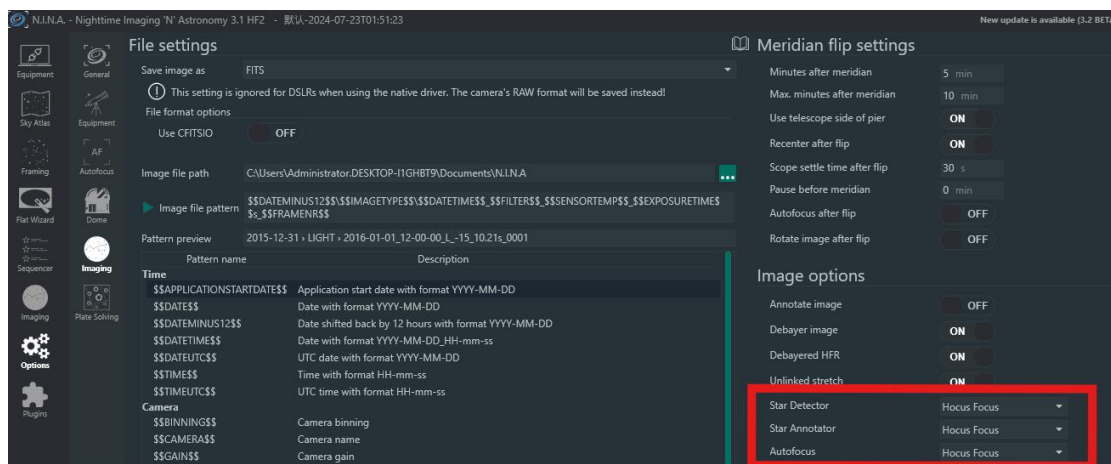


Figure 10

Next, you need to specify a save path for the Hocus Focus plugin. Enable the "Save" option by going to NINA > Plugins > Installed > Hocus Focus > Options > Autofocus, then browse and select a folder to store the result files generated by the Aberration Inspector (Figure 11). It is recommended to choose a folder with sufficient disk space, as these files can be quite large.

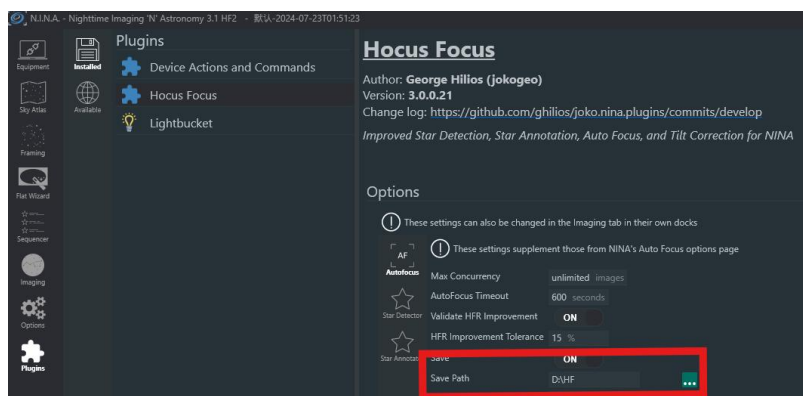


Figure 11

You are now ready to run the Aberration Inspector tool provided by the Hocus Focus plugin. The Wanderer FETA M92 will adjust its three tilt correction points automatically based on the inspection results. To achieve the best results, ensure that the Aberration Inspector is properly configured and used correctly.

To run automatic tilt adjustment, you also need to configure the correct parameters in WandererEmpire, similar to how you would set step size and backlash when configuring a focuser.

In the upper right corner of the WandererEmpire interface, you will find the control area for automatic tilt adjustment(Figure 12). The software provides instructions to help guide you through the setup. It will be explained in more detail below:

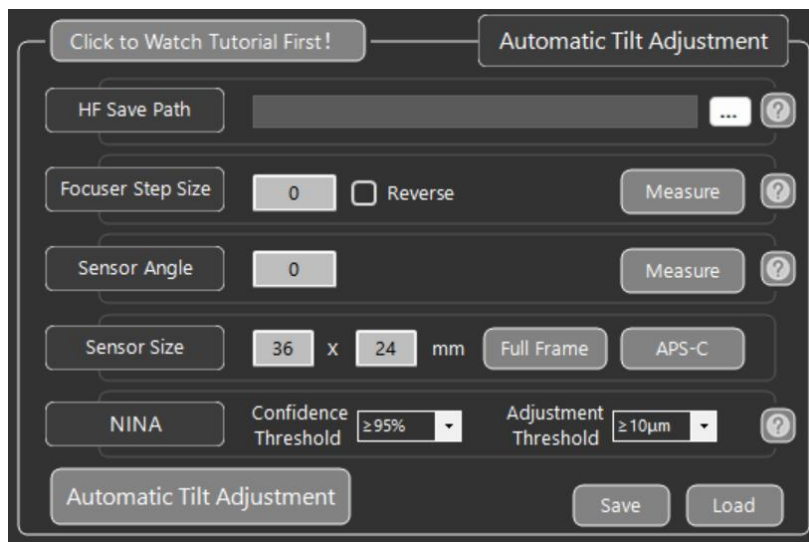


Figure 12

Step 1: Set the Hocus Focus Save Path. This path must match the save directory you configured for Hocus Focus in NINA, as WandererEmpire reads Aberration Inspector data from that folder to perform automatic tilt correction.

Step 2: Set the Focuser Step Size. For FETA M92 please fill in 0.04 and do not check Reverse.

Step 3: Set the Camera Sensor Angle, which is the rotation angle of the FETA M92 relative to the camera sensor. The angle value ranges from 0 to 360 degrees. Click Measure to let WandererEmpire decide it. **An incorrect Upside Down setting will become obvious during the tilt adjustment process, as the results will worsen rather than improve.**

Step 4: Enter the correct Camera Sensor Size; incorrect values will result in invalid or inaccurate adjustment results.

Once all parameters are set, click the "Automatic Tilt Adjustment" button. Before each adjustment run, execute Aberration Inspector in NINA. Before the FETA M92 moves, a dialog will appear showing adjustment confidence. Ideally, this value should be above 90%. If it is lower than 90%, the result may not be reliable. There could be many causes, such as poor star detection, environmental issues or poor camera sensor coplanarity.

After the FETA M92 completes the tilt adjustment, run Aberration Inspector again to verify the result. Repeat the process until it is optimal. Typically, the Adj Microns values(Figure 13) at all four corners can be reduced to within 5-10 microns. Please note that Adj Microns equals Adj Steps multiplied by the step size. If you don't see the Adj Microns field in the Aberration Inspector results, it's because you haven't entered the focuser step size in Aberration Inspector-Options.

As mentioned earlier, an incorrect sensor angle setting can lead to incorrect adjustments. In such cases, you will observe increasingly poor tilt results, and the FETA M92 will eventually report that it is out of adjustment range. If this happens, you need to go back to WandererEmpire and verify the setting.



Figure 13

4.2 NINA Sequence Integration

[Video tutorial for NINA integration of FETA](#)

By installing the WandererEmpire software, you've already installed our NINA plugin for FETA M92. After entering NINA advanced sequence page, you can see the instructions on the right(Figure 14).

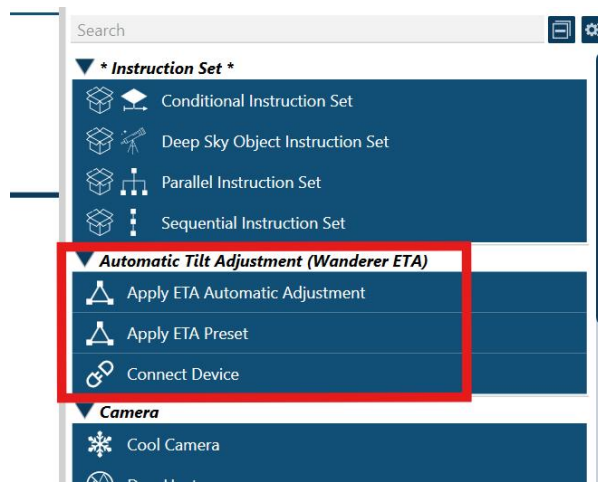


Figure 14

This plugin provides three sequence instructions:

1. Apply ETA Automatic Adjustment: Triggers automatic tilt adjustment in Wanderer Empire. This instruction must be used in conjunction with the Hocus Focus – Run Aberration Inspector instruction in Advanced Sequencer. You must insert the Run Aberration Inspector instruction BEFORE inserting Apply ETA Automatic Adjustment in the Advanced Sequencer. In Wanderer Empire, you can configure the confidence threshold and adjustment threshold for the Hocus Focus results to ensure reliable and optimal performance.
2. Apply ETA Preset: Sometimes, you may need to apply different ETA presets after a meridian flip, target change, or CAA rotation. This instruction is designed to simplify and automate these scenarios.
3. Connect Device: This helps you to connect the FETA M92 at the beginning of a sequence.

5. Firmware Upgrade

The firmware upgrade feature has been integrated into WandererEmpire. Click on the left-side menu to access the firmware upgrade interface (Figure 15). We recommend carefully reading the firmware upload tutorial on the right side of the interface.

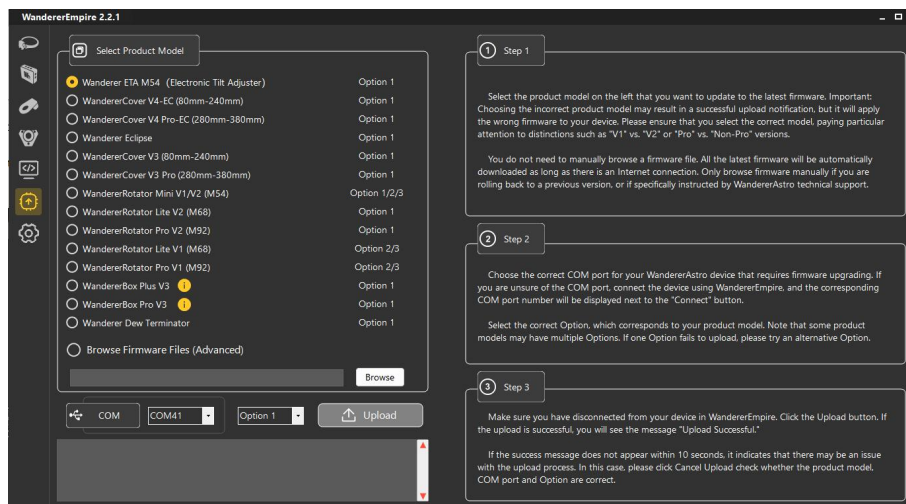


Figure 15

On the left side of the interface, select the corresponding product model (Figure 16).

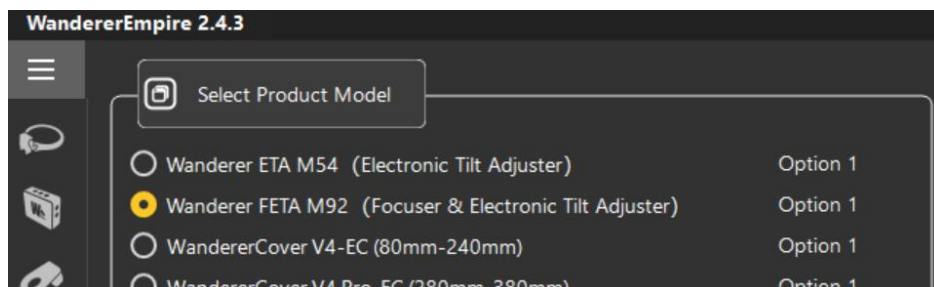


Figure 16

Below, select the correct COM port (if unsure, refer to **Chapter 3.2** to find your FETA COM port) and Option 1 (Figure 17). Click "Upload". Upon successful upload, the dialog box will confirm that the upload was successful. **Please note that before the upload, you need to disconnect from the FETA M92 in WandererEmpire**, or it will result in an error indicating a failure to open the COM port.

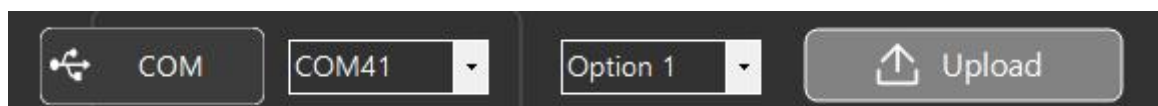


Figure 17