Wanderer ETA M54

Electronic Tilt/Back Focus Adjuster

User Manual（2025.3.19）

Contents

1. Introduction

Wanderer ETA M54 (Electronic Tilt Adjuster) is an innovative electronic tilt and back focus adjuster that allows users to precisely, quickly, and remotely adjust the camera's tilt and back focus.

The specifications of the Wanderer ETA M54 are shown in the table below:

Power	Powered by USB (5V 0.5A)
USB	USB2.0 Type-B （Cable included）
Weight	470g
Payload	⩽3kg
Back Focus(Focuser Travel) Consumption	5 mm when directly connected to OAG via screws
Travel	1.2mm
Accuracy	0.002mm （2 microns）
Motor	0.3 microns/step
Operating temperature	-25℃-50℃

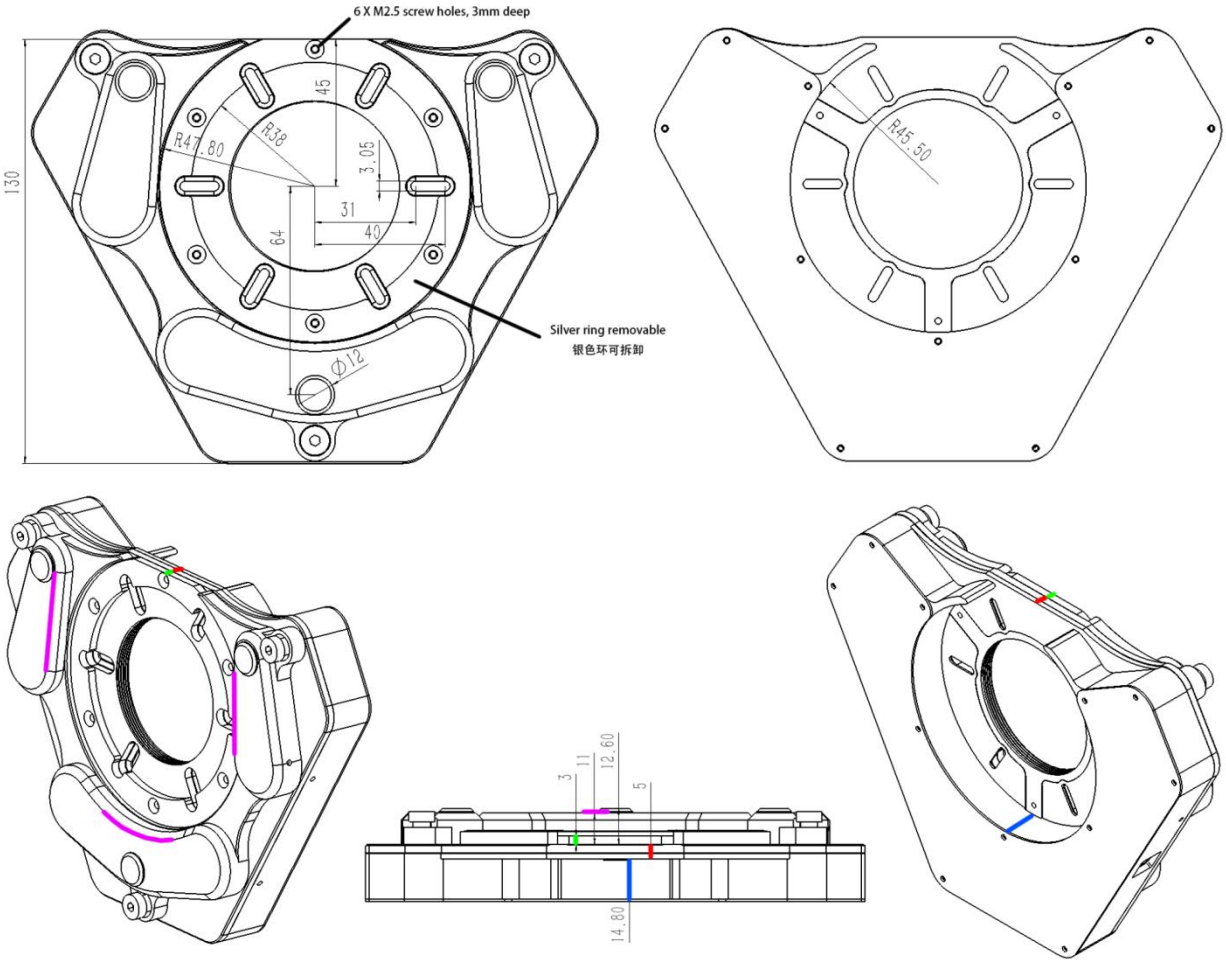

Figure 1

2. Installation Guide

The Wanderer ETA features a lightweight and ultra-thin design, which limits its load capacity. It is **only suitable for** installation in front of the camera, filter wheel, or OAG and is **not suitable for** use in front of heavy field flatteners, reducers, or focusers. Additionally, please ensure that the total weight of the equipment behind the Wanderer ETA does **not exceed 3kg**, as exceeding this limit may compromise its rigidity.

2.1 Installation method 1: Connect to OAG using screws

The telescope side of the Wanderer ETA is equipped with an M54 female thread. For the camera side, the Wanderer ETA features six evenly spaced slots at 60-degree intervals (see Figure 1). These slots allow M2.5 or M3 screws to pass through, enabling secure attachment of the Wanderer ETA to an OAG (see Figure 2).

Figure 2

Please read the following carefully to ensure your OAG can be connected to Wanderer ETA.

Necessary Condition 1: The thread holes on the telescope side of the OAG must be M2.5 or M3, with a hole circle radius between 31mm and 40mm. Additionally, the hole positions must align with the

slot angles provided by the ETA. For example, the red-marked dimensions in Figure 3 meet the installation requirements.

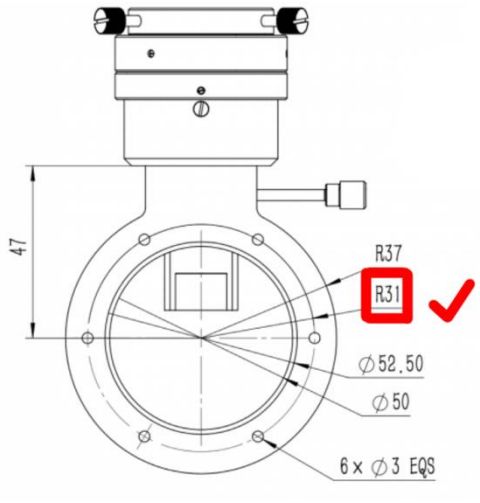

Figure 3

Necessary Condition 2: The distance from the optical axis center of the OAG to the bottom protrusion of the OAG focuser must be at least 45mm. For example, the red-marked dimensions in Figure 4 meet the installation requirements, whereas the red-marked dimensions in Figure 5 do not.

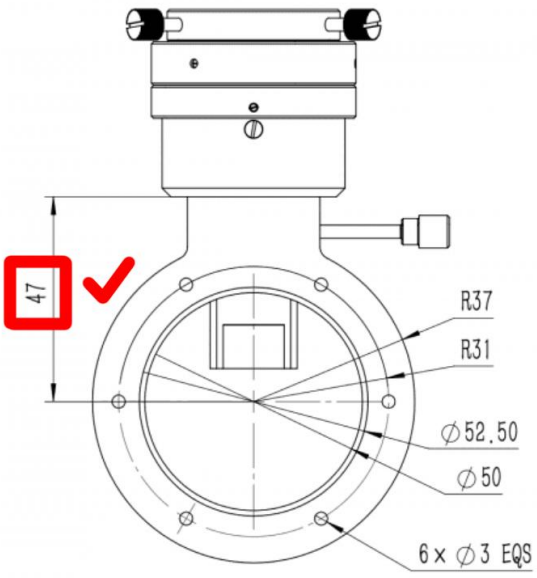

Figure 4

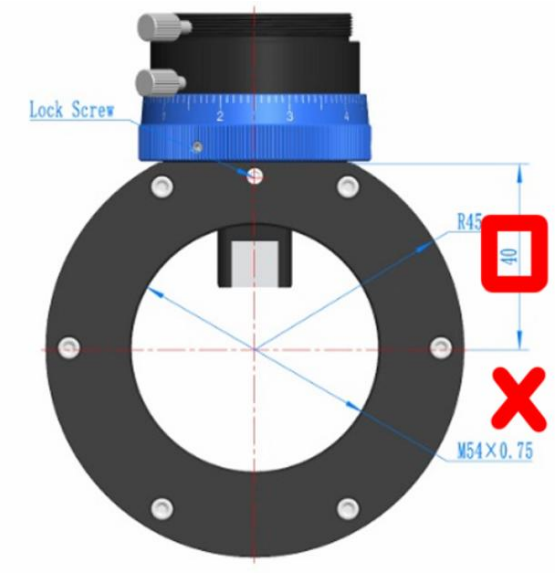

Figure 5

Necessary Condition 3: The outer diameter of the OAG must be less than 91mm.

Based on these three necessary conditions, the table below summarizes the compatibility of commonly available OAG models with direct screw connection to the Wanderer ETA:

OAG Model	If Wanderer ETA can be mounted on it via screws	Note
ZWO OAG-L	Yes	/
QHY OAG M/L (Pro)	Yes	/
QHY OAG S	No	Necessary condition 2 not met
Touptek OAG-X	Yes	/
Touptek OAG-L	Yes	OAG focuser heightening bracket required
Player One FHD-OAG MAX	Yes	Need to raise the OAG focuser
Player One FHD-OAG MINI	No	Necessary condition 2 not met
Pegasus Indigo OAG	No	Necessary condition 1 not met

If your OAG has a filter wheel installed behind it, you must also meet Necessary Condition 4: The total back focus distance of the equipment between the ETA and the filter wheel must be at least 16mm. For example, as shown in Figure 6, this setup meets the installation requirement, whereas the setup in Figure 7 does not.

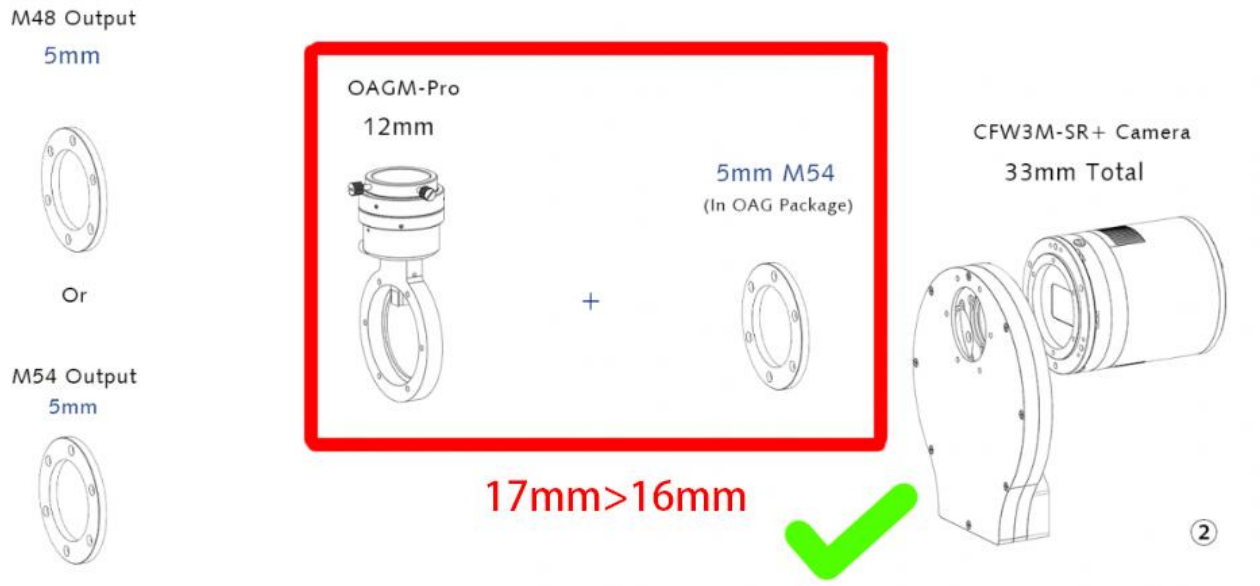

Figure 6

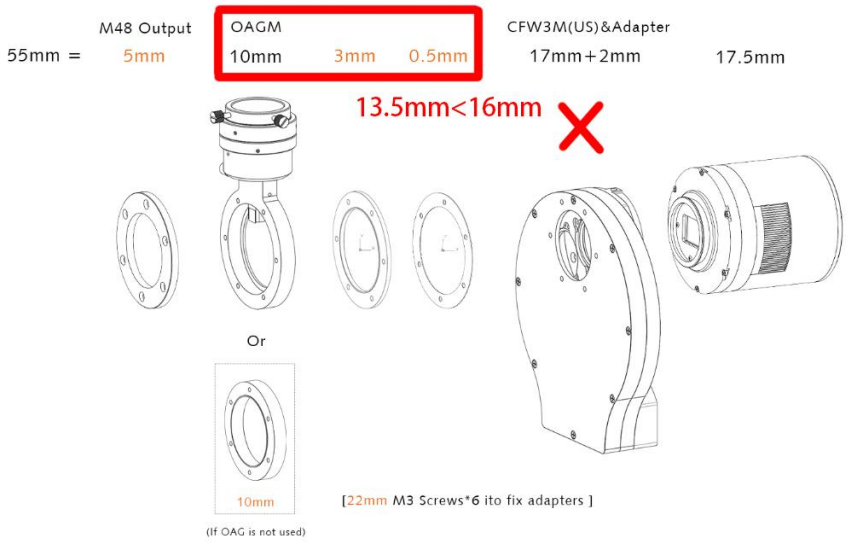

Figure 7

When using screw connections to attach the ETA to an OAG, **the 55mm back focus distance is generally maintained in most cases**. Below is an installation guide for common 55mm back focus solutions from major brands:

As shown in Figure 8, for **ZWO** full-frame and APS-C 55mm back focus solutions, you only need to replace the tilt adapter (highlighted in red) with the Wanderer ETA while keeping the 55mm back focus unchanged.

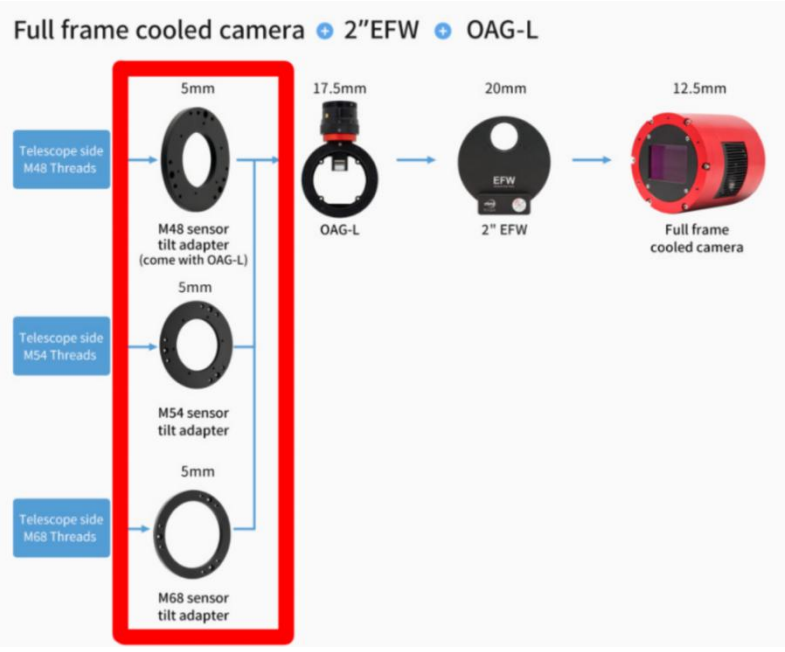

Figure 8

As shown in Figures 9 and 10, for **QHYCCD** full-frame and APS-C 55mm back focus solutions, replacing the tilt ring (red box in Figure 9 and 10) with the Wanderer ETA will also maintain the 55mm back focus.

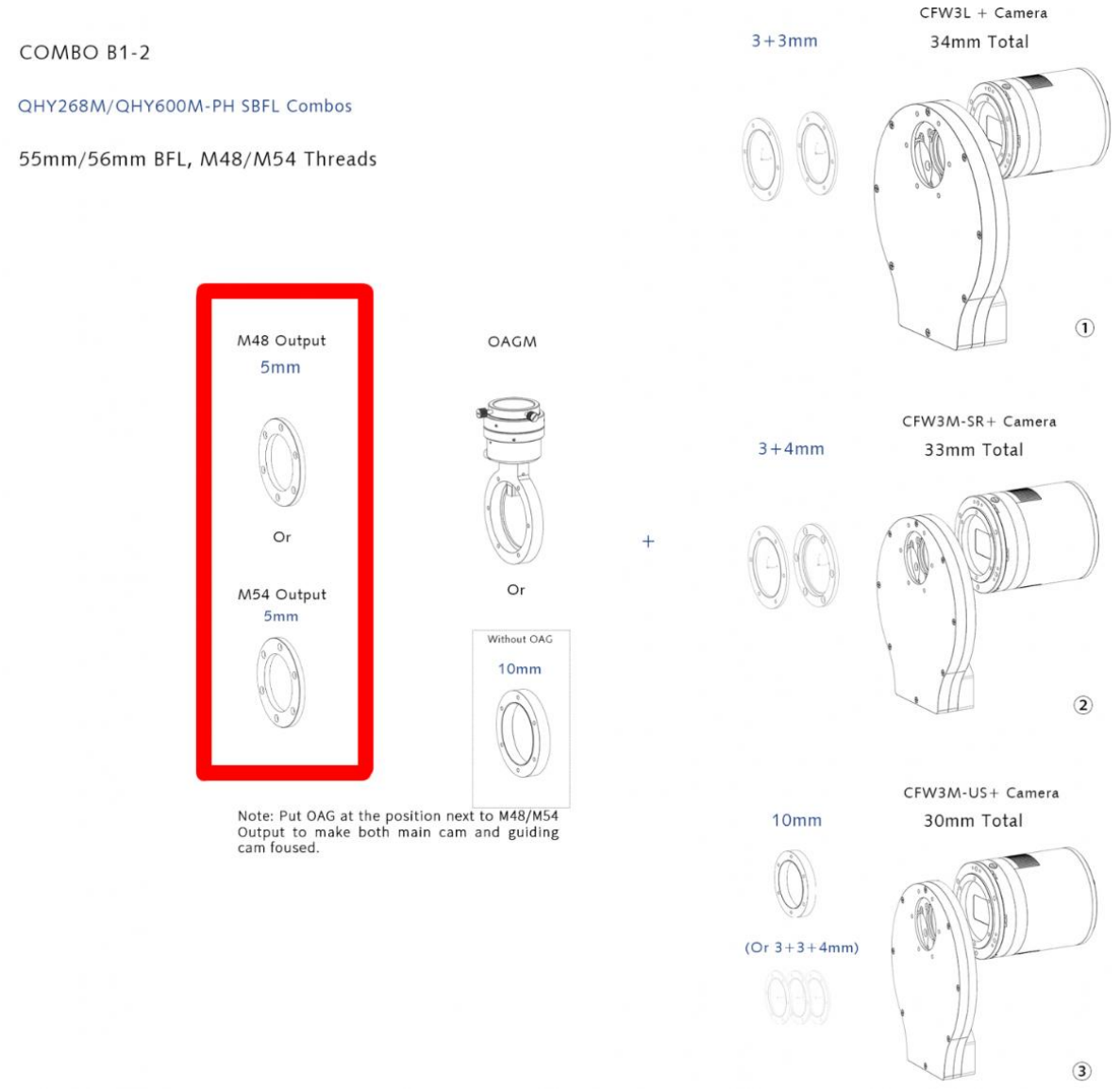

Figure 9

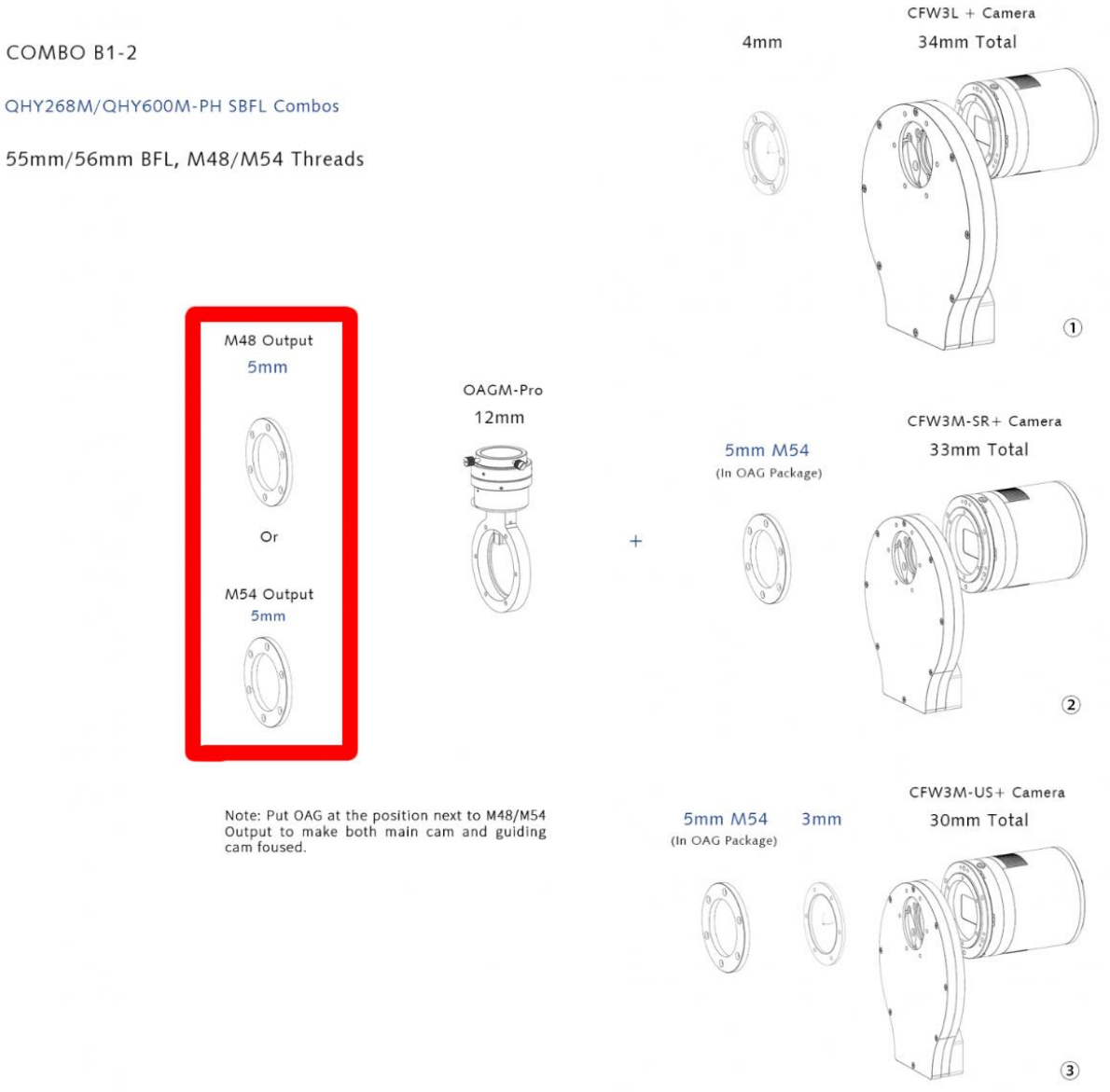

Figure 10

As shown in Figure 11, for **ToupTek ATR series** 55mm back focus solution, you need to remove the camera's front adapter ring to reduce its default back focus from 17.5mm to 12.5mm. Then, install the ETA directly in front of the OAG (red box in Figure11). Do not remove the OAG's built-in 6mm thick M48/54/68 adapter ring, which is fixed by six screws. Instead, symmetrically remove four screws and use them to attach the ETA to the OAG to avoid loosening the screws that secure the prism.

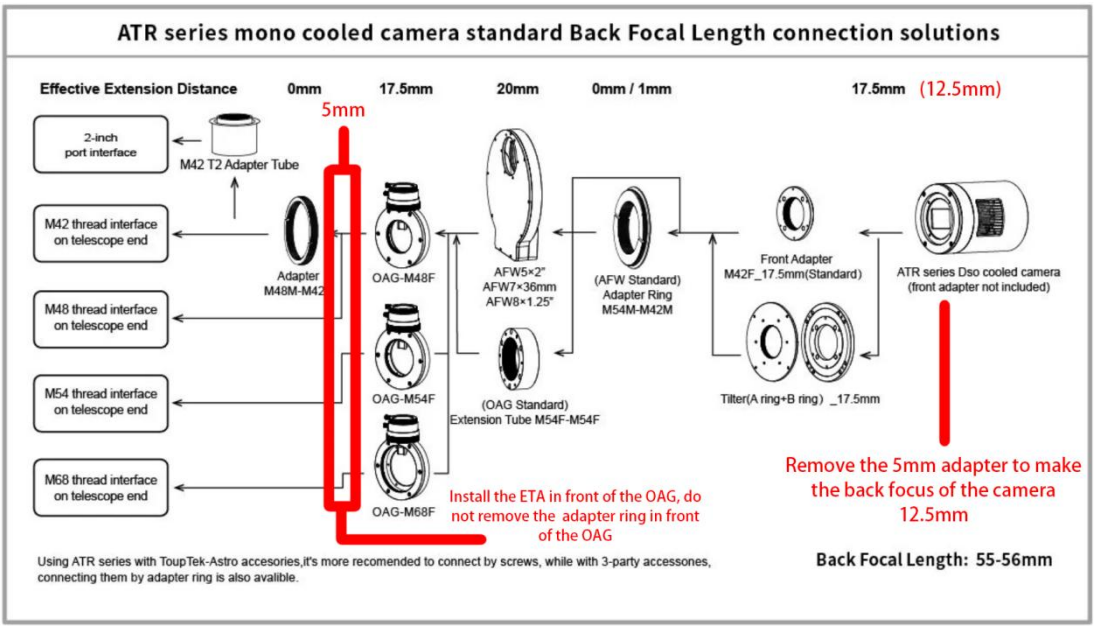

Figure 11

As shown in Figure 12, for **ToupTek SkyEye series** full-frame cameras with a 55mm back focus solution, you only need to remove the adapter ring indicated by the red arrow and install the ETA directly in front of the OAG (red box in Figure12). Again, do not remove the OAG's built-in 6mm thick M48/54/68 adapter ring, which is fixed by six screws. Instead, symmetrically remove four screws and use them to secure the ETA to the OAG, ensuring that the prism remains properly secured.

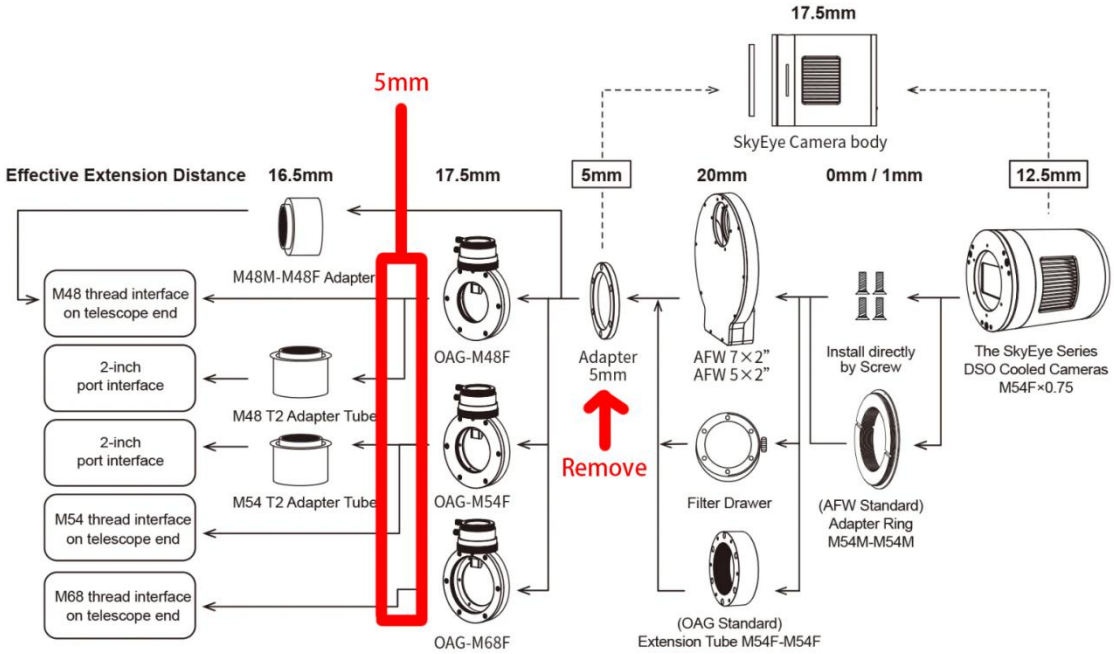

Figure 12

As shown in Figure 13, for the 55mm back-focus solution of **Player One**'s full-frame and APS-C cameras, you need to remove the 5mm tilter ring in front of the camera, reducing the default back-focus from 17.5mm to 12.5mm. Then, mount the ETA directly in front of the OAG (red box in Figure 13). Please note that the OAG's built-in adapter ring should not be removed.

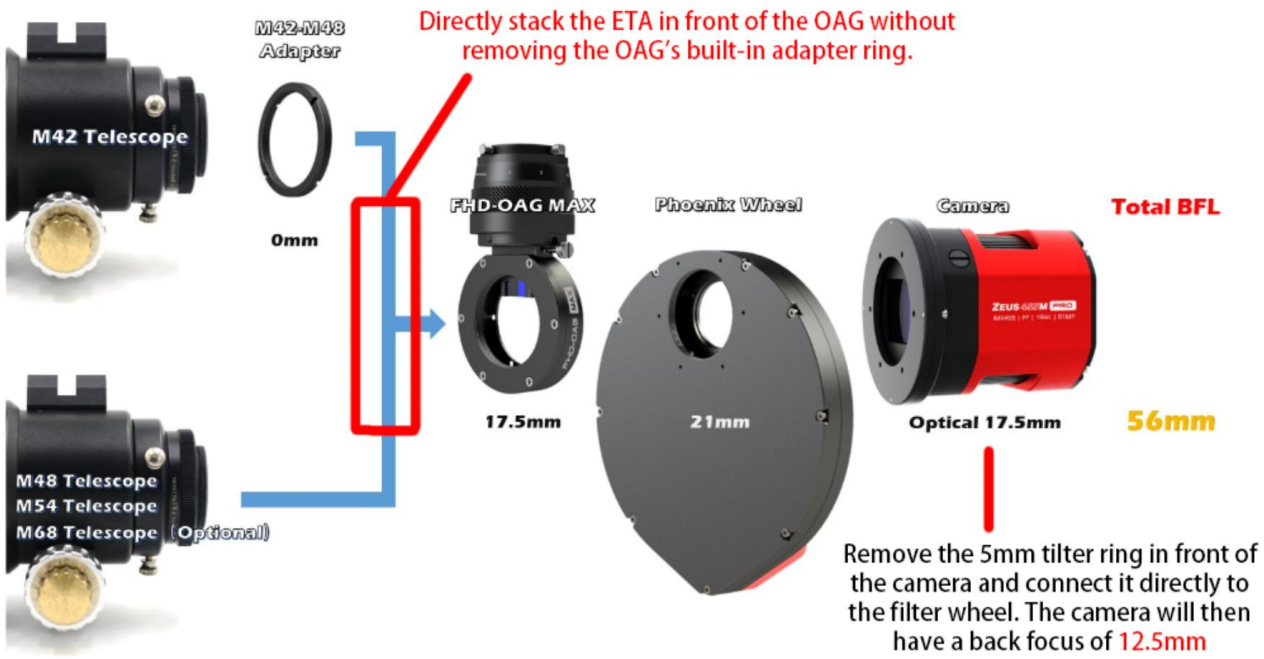

Figure 13

2.2 Installation method 2: Connect to the camera using screws

The telescope side of the Wanderer ETA is equipped with an M54 female thread. On the camera side, the Wanderer ETA features six evenly spaced slots at 60-degree intervals, allowing M2.5 or M3 screws to pass through for direct connection to the camera (see Figure 14). This installation method is suitable for users who do not use a filter wheel. Please ensure that your camera's screw hole positions are compatible with the ETA before installation.

Figure 14

2.3 Installation method 3: Connect with threads

The telescope side of the Wanderer ETA is equipped with an M54 female thread. For the camera side, if you need to use a threaded connection, you can purchase the "Camera Side M54 Female Adapter for Wanderer Electronic Tilt Adjuster M54". After securing the adapter to the ETA with screws, the back focus distance occupied by the Wanderer ETA will be 10mm. At this point, the Wanderer ETA will have M54 female threads on both sides.

Please note, when connecting, use an M54 male thread adapter ring with a thread length of 4mm or less, as longer threads may damage the ETA.

3.Software

3.1 Install WandererEmpire

Visit the official website WandererAstro to download the WandererEmpire software (Figure 15).

Figure 15

3.2 Connect to Wanderer ETA

After installing WandererEmpire, double-click to open the software. In the left-side menu, select the "Wanderer ETA" option (Figure 16).

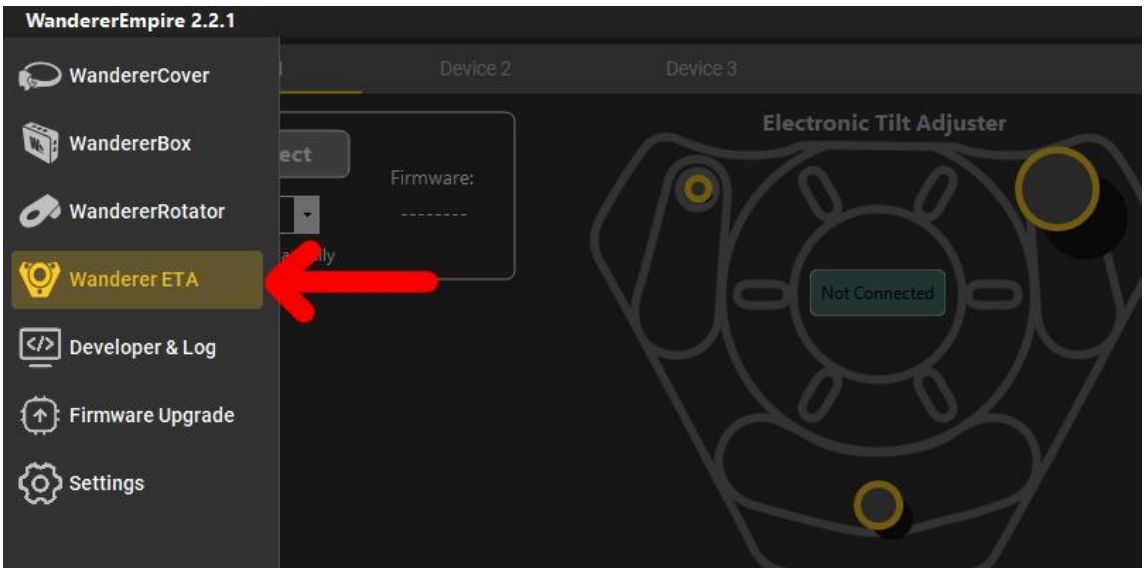

Figure 16

At the top of the interface, you will see options labeled "Device 1," "Device 2," and "Device 3." This indicates that WandererEmpire supports simultaneous connections for up to three Wanderer ETAs. If you need to operate more than three ETAs on a single PC, please contact us (Email: skywatcherwsl2000@gmail.com, Frank Wang).

If you know the COM port of the ETA (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 17).

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. If your computer has multiple COM ports, this process might be slow and could result in connection failures. Once WandererEmpire automatically identifies the correct COM port, it is recommended to enable "Select COM Manually" and select the identified COM port to speed up future connections.

Figure 17

3.3 Control Interface Overview

Please refer to Figure 18:

At the top of the interface, there is a visualization of the current status of the ETA, 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 ETA. You can click the buttons to roughly control the movement of the adjustment points or enter a target millimeter value and click the "Move" button. The minimum input resolution supported is 0.001 millimeters, and the input range is 0-1.2 millimeters. You can also click the "Zero" button to quickly return the adjustment points to 0mm.

On the bottom 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 ETA at different orientations of

the telescope. Click  to record the current values of the three adjustment points for future use.

Click  to move the ETA to the preset values for the three adjustment points.

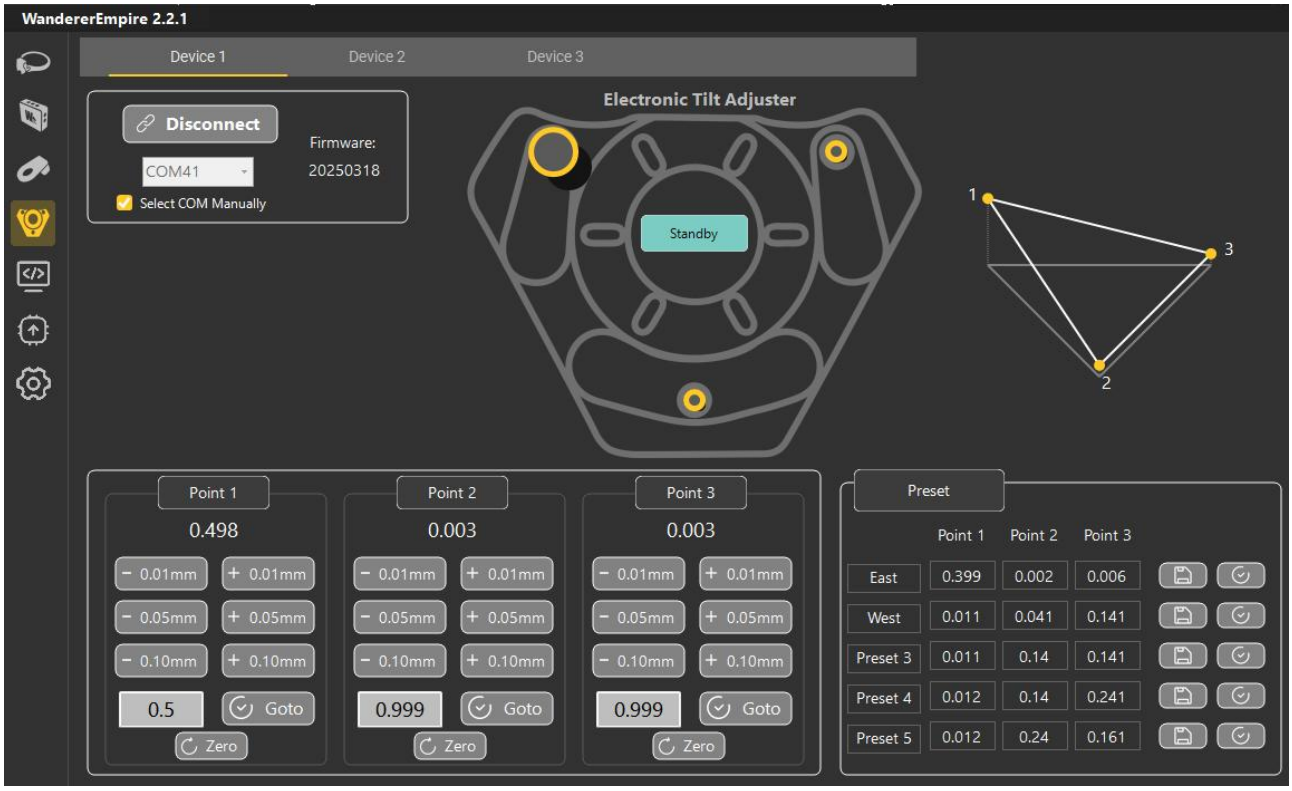

Figure 18

4.Firmware Upgrade

The firmware upgrade feature has been integrated into WandererEmire. Click on the left-side menu to access the firmware upgrade interface (Figure 19). We recommend carefully reading the firmware upload tutorial on the right side of the interface.

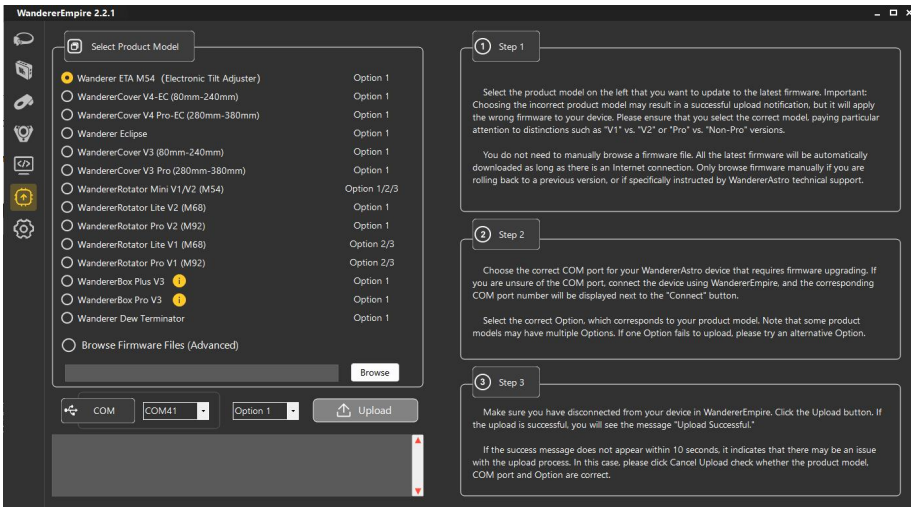

Figure 19

On the left side of the interface, select the corresponded product model (Figure 20).

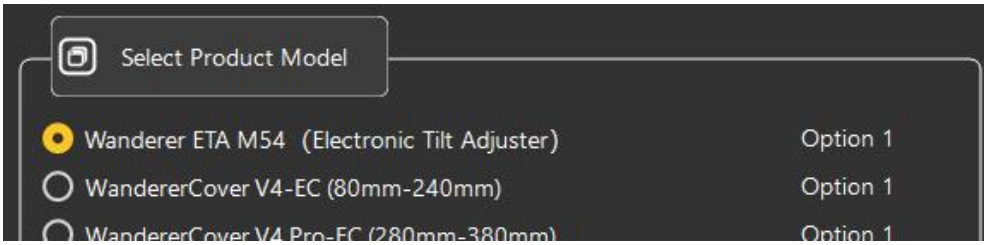

Figure 20

Below, select the correct COM port (if unsure, refer to **Chapter 3.2** to find your ETA COM port) and Option 1 (Figure 21). 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 ETA in WandererEmire**, or it will result in an error indicating a failure to open the COM port.

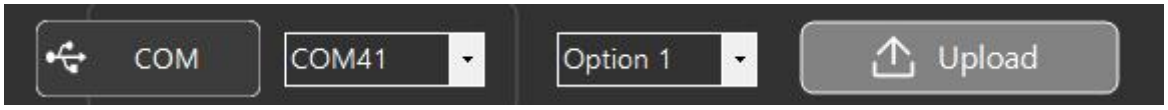

Figure 21