ZWO-AM3

User Manual

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Scan the QR code to watch the video

Preface

Thank you for purchasing the **ZWO AM3 Strain Wave Gear Mount**. After years of research, ZWO developed strain wave gears to meet the astrophotography needs of low periodic error, stable transmission, and high torque output. Each mount has a PE curve for performance measurement. In addition, the belt drive is adopted to achieve 300:1 reduction to achieve high-precision control. The AM3 uses updated technology, an integrated manufacturing process, and modern industrial design concepts. It is lightweight and stable while in use. It does not blindly pursue a lightweight design, but focuses, more importantly, on stability and durability during use. A Strain Wave GearGerman equatorial mount with a lightweight design, a load capacity that can meet the capacity requirements of most astrophotography setups. The AM3 equatorial mount has the capabilities of fast response, accurate tracking, convenient operation, and wide compatibility, which can meet the needs of astronomical observation and astronomical photography, and provide better assistance for astronomy enthusiasts on their star exploration journey.

The purpose of this manual is to introduce the use of the equatorial mount to users in the form of text descriptions and illustrations, and to remind users of possible improper operations or dangerous situations. Please make sure to read this manual carefully before using the equatorial mount, and strictly follow the instructions in the manual carefully. Any equipment damage and personal injury caused by improper operation are the responsibility of the user. ZWO AM3 Strain Wave Gear Mount software and hardware are developed and designed with independent intellectual property rights, which are perfectly compatible with ASIAIR, and support ASCOM, INDI and other platforms.

Tips

This manual can guide the user to use the AM3 Strain Wave Gear Mount safely and efficiently.

Before using the equatorial mount, please make sure to read the following tips carefully, and

follow the instructions in this manual during actual use.

1.When using AM3, please do not directly observe or image the sun with naked eyes through telescopes or finder glasses, without using specially designed solar filters. This will cause permanent and irreversible damage to the observer's eyes, and damage to property and equipment. With solar observing and imaging, always use specially designed solar filters.

2.Please carefully select a suitable tripod according to the size and weight of the telescope and then determine if your setup needs a counterweight. Without a counterweight bar and counterweight installed on the AM3 Strain Wave Gear Mount, the center of gravity of the telescope may deviate from the tripod and cause the tripod & telescope to tip over. Please test the center of gravity of the telescope in all directions in advance to avoid this situation, causing equipment damage or personal injury.

3.After the use of the AM3, please reset the mount's position to zero (home position), and then power down the mount. Failing to do this step will cause the home position and GOTO function to be inaccurate at the next start up, which might further cause equipment damage or personal injury. If the mount is not at home position at power down, then by the next time it is powered on, please try to return it to home position first before you do any other operation.

4. Please do stop unsupervised children from using the mount or touching the mount. This will help avoid an accidental rollover or personal injury. In addition, small parts are included with this mount which may also cause suffocation or other injuries to children.

5. Do not place the equatorial mount in a high-humidity and high-salt environment. This will cause corrosion of the mount's components, which may cause the equatorial mount to run poorly or reduce the accuracy of the mount, and may cause short circuits and permanent damage.

6.Do not use corrosive solutions to clean the mount, so as not to corrode the surface oxide layer and damage the mount. Also exposing the mount to the sun for long periods of time may cause the appearance of the oxide layer to discolor.

7.Do not attempt to disassemble the mount. This may damage the mount, reduce the accuracy of the mount, or even cause personal injury to the user.

8.The ZWO AM3 Strain Wave Drive Mount is a precision instrument. Please handle it with care to avoid damage to the mount and reduce the accuracy.

9.The operational temperature of the ZWO AM3 Strain Wave Drive Mount is -15℃-40℃, please do not use the mount outside this temperature range. Doing so may cause the equipment to fail to operate normally and may cause equipment damage.

Included Items

1. Case x1

2. AM3 mount x1

3. 2m USB2.0 cable (Type-B to Type-A) x1

4. AM3 Periodic error report x1

5. Quick Guide Brochure x1

6. Hand Controller x1

7. 2m Hand Controller Cable x1

8. M6 Allen key x1

9. M4 Allen key x1

1. Product introduction

As the second strain wave drive mount released by ZWO, the AM3 integrates lightness, precision, intelligence, and high performance into one. It meets the needs of astrophotographers and also the market trend of portability prior, which makes it a revolutionary outbreak product compared to traditional mounts.

The mount's features are as follows:

1. High precision: AM3 is equipped with a special harmonic reducer for astronomy to achieve high-precision control, and the periodic error is stable within ±15 arcseconds. It can stably transmit large torque output, and at the same time measure the PE error curve of each machine to ensure performance.

2. High load: the body weight is 3.9kg, and the load capacity is up to 8kg. If the counterweight is added, it can reach 13kg.

3. Independent intellectual property control system: The software and hardware control system with completely independent intellectual property rights is maintained and upgraded by a professional team to ensure the stability of the system.

4. Dual mode: AM3 has two modes: equatorial mount and alt-azimuth, suitable for visual use and photography.

5. No restrictions on areas of use: AM3 is designed with a pitch angle of 0-90 degrees, and can also be used in equator and polar regions.

6. Hand Controller + APP control: Through the mobile phone, you can get access to the functions of Tonight's Best, target GOTO, real-time star database and so on. There is no need to

connect to a computer. What's more, the mount and hand controller can also be upgraded online through your mobile phone.

Other advantages:

1. Fully sealed structure design: Prevents the strain wave gear from rusting, dust and dew.

2. Convenient home position design: The mount can return to the home position quickly and easily at any position.

3. Power-off brake: Prevents the telescope and equipment from falling and resulting in damage or injury during a power failure.

4. ASIAIR, PC use seamless connection: ASIAIR can connect and control AM3 through wireless or wired way, and the PC supports ASCOM and INDI to control.

2. Performance Parameters

AM3	Description
Mount type	German Equatorial Mount
Mount mode	Equatorial/Alt-Azimuth
Drive	Strain Wave Gear + synchronous belt (300:1 reduction ratio)
Periodic error	<±15''
PE duration	288s
Drive (RA)	Stepper motor + synchronous belt + 14 type 100 reduction ratio harmonic + brake
Drive (DEC)	Stepper motor + synchronous belt + 14 type 100 reduction ratio harmonic + brake
Load	8kg (w/o counterweight) / 13kg (with counterweight) @20cm
Mount weight	3.9 kg
Latitude adjustment range	0°-90°
Azimuth adjustment range	±6°
Dovetail	Losmandy & Vixen
Interface thread for counterweight bar	M12 *1.75 coarse teeth
Stepper motor resolution	0.17''
Max slew speed	6°/S
Slew speed	0.5x, 1x, 2x, 4x, 8x, 20x, 60x, 720x, 1400x
Power port	DC5.5-2.1mm (12V, not less than 3A)
Power consumption	12V/0.4A (Standby) 12V/0.6A (Tracking) 12V/1.7A (GOTO)
Guide interface	ST4
Communication Interface	USB/BT
Zero position	Mechanical
Operating temperature	-15℃-40℃
Power-off brake	Yes

3. How to Use

3.1 Introduction to the equatorial mount

① **Finder shoe slot mounting holes:** Can be used to install finder shoe or ASIAIR.

② **Power switch:** Turn the power on or off.

③ **Counterweight screw hole:** Unscrew the cover to connect the optional counterweight bar and counterweight.

④ **Pitch angle gear adjustment screw:** A screw is located on either side of the mount. Loosen them with a hexagonal wrench and then adjust the pitch angle to a certain degree from 0 to 90.

⑤ **Pitch angle tension grip:** Loosen the knob to adjust the pitch angle. Don't forget to tighten it after use.

⑥ **Pitch angle fine-tuning knob:** Rotate it clockwise to get the mount pitch up, counterclockwise to get the mount pitch down.

⑦ **Azimuth fine-tuning knob:** Rotate the knobs on both sides to adjust the azimuth base.

⑧ Dovetail saddle plate tension knob: Can be used to adjust the width to fit Vixen and Losmandy style dovetails.

⑨ **Auto guide:** Can be used to connect a ST4 guide cable.

⑩ **USB 2.0 interface:** Can be used to control the mount and upgrade the firmware. You can also connect USB devices, including your computer to it.

⑪ **Bluetooth indicator:** You can choose to connect the mount via Bluetooth on your phone. This Bluetooth indicator will be useful for you to confirm whether the mount is connected.

⑫ **HC interface:** Can be used to connect the hand controller.

⑬ **Power in:** 12V/3A-6A, DC D5.5x2.1mm (Positive inside and negative outside). The power voltage should not be less than 10.8v. Otherwise the buzzer inside the mount will beep to alert the user. 12V power output port: After the main body is connected to the power supply, it can be connected here to supply power to devices such as AISAIR.

⑭ **Mount mode indicator:** Red light for equatorial mode, green light for alt-azimuth mode. It will flash red and green in turn when the time and location information are not synchronized. Once synchronized, it will show the right light color of the current mount mode.

⑮ **Pitch angle scale: Indicates the current pitch angle from 0° to 90°.**

⑯ **Dovetail saddle plate:** Compatible with both Losmandy and Vixen style dovetails.

Pitch angle scale: 0~90 degrees.

3.2 Introduction to hand controller

Light Indicator: Indicates high or low sidereal tracking rate of the mount. High rate when the light is on.

Directional Control Joystick: The joystick can be used to slew the two axes. Press down the joystick knob to switch between high and low slew speed. There are 1, 2, 4 and 8 x sidereal rate at low speed, 20 to 1440 x sidereal rate at high speed.

Tracking button: Click to enable or disable tracking. When the tracking is on, the indicator will flash red or green.

Cancel button: Long press for 3 seconds to cancel the current function.

Mode switching: When AM3 is powered off, long press the cancel button until you get the AM3 mount powered and the light indicator switches the color. The mount will be successfully switched to another mode then.

How to identify the Altazimuth/ Equatorial mode and switch to a different mode?

The default setting of AM3 is Equatorial mode. During the first 5 seconds after the mount boots up:

Light indicator turns red - the mount is in Equatorial mode.

Light indicator turns green - the mount is in Altazimuth mode.

If you forget the hand controller's WiFi password, you can press and hold the Tracking and Cancel buttons together until the mount boots up and keep pressing for 5 seconds after it. Loosen them when the high-speed indicator light flashes. The WiFi password will then be restored to the default setting: 12345678

3.3 Mounting the equatorial mount

3.3.1 Mount installation

*Tripod model: ZWO carbon fiber TC40

Unfold the tripod

Secure the Installation Disk:

Use a hexagonal wrench to attach 3 x M6 screws to fix the mounting plate on the main body of the AM3.

Install the body on the tripod:

Place the main body of the equatorial mount on the tripod, install the multi-function support rod in the positive direction (as shown in Figure 1 below), and turn the knob clockwise to lock it.

3.3.2 Handle Controller Connection

Use the coiled cable to connect the hand controller to the AM3 mount body. The hand controller has a WiFi hotspot, which can be connected to use wireless control of the equatorial mount.

3.3.3 Bluetooth connection

The AM3 has the new feature of Bluetooth. If you forget to bring the hand controller, you can control the mount via Bluetooth on your phone. Here are the steps:

Launch ASI Mount App, go Mount setting and then choose Bluetooth to connect. Follow the prompts. The Bluetooth indicator will be off after Bluetooth connection succeeds.

3.3.4 Pier extension (optional) installation

First, install the pier extension onto the tripod.

Then install the mount onto the pier extension and tighten the knobs.

Installation completes.

3.3.5 Counterweight (optional) installation

How to choose whether to install a Counterweight?

If the combined weight of the telescope is less than 8KG, the equatorial mount is not required to have a counterweight installed. If the combined weight of the telescope reaches 8KG or more, it needs to be installed with a counterweight. The total weight of the telescope should not exceed 13KG. In order to ensure the stability of the equipment, it is recommended to use a counterweight when the total weight of the telescope reaches 8KG, and the interface thread of the counterweight

Counterweight installation steps

1. Find the mounting screw hole for the counterweight at the bottom of the AM3 mount body.

The screw hole will have a silver color plug in.

2. Turn the plug counterclockwise until fully unscrewed.

3. Install the counterweight bar and tighten clockwise, then install the weight.
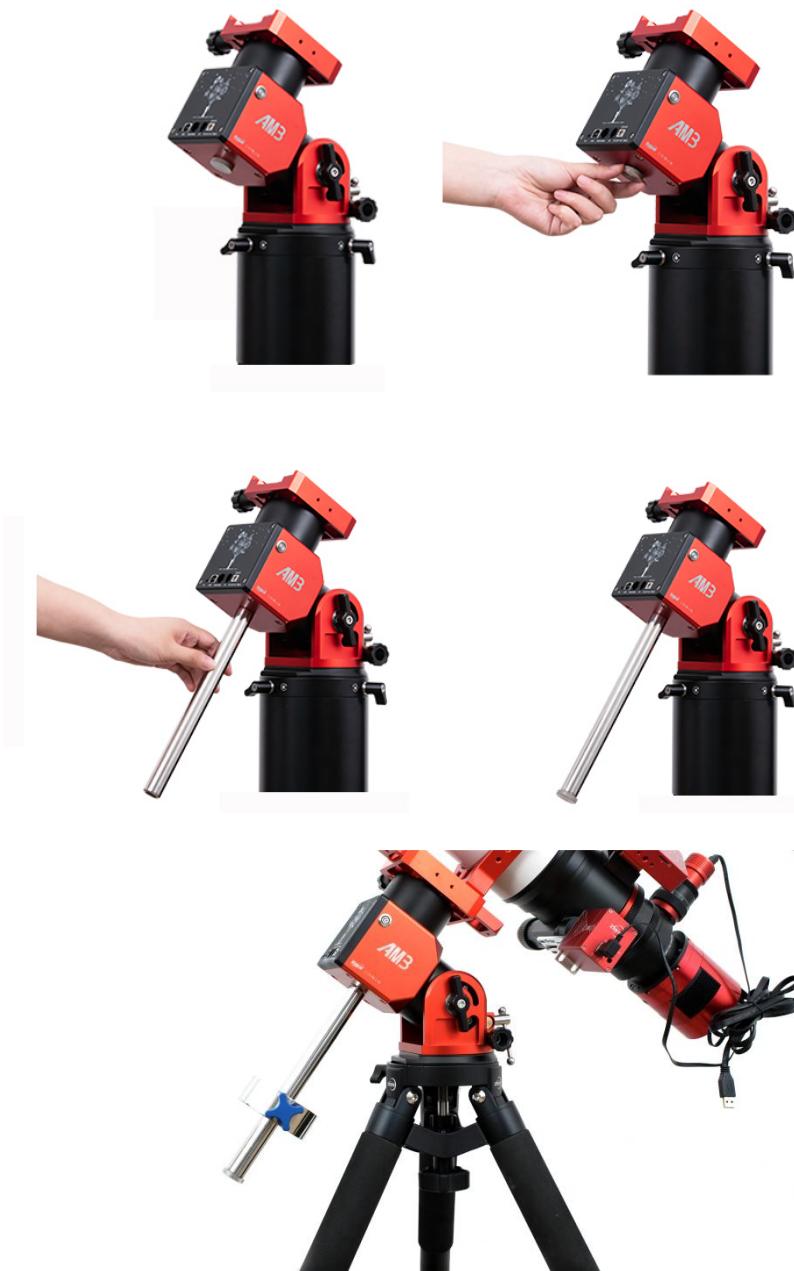
3.3.6 ASIAIR (optional) installation

Remove or buy a finder mirror slot and put it on the side of the dovetail slot, ASIAIR can be

installed on the side of the dovetail slot or on the main mirror.

3.4 Use of equatorial mount

3.4.1 How to adjust the pitch angle from the first gear to the second gear?

Equatorial mount gear introduction:

The pitch angle adjustment of the equatorial mount AM3 is divided into two gears, the first gear pitch angle range: 0~60°; the second gear pitch angle range: 45°~90°. When the equatorial mount is in the first gear, the maximum adjustment angle can only reach 60°. You need to use a hex wrench to loosen the [pitch angle gear adjustment screws] on both sides of the main body, and then turn the equatorial mount to the second gear (45° position). After completion, tighten the screws on both sides, and continue to adjust the Pitch Angle Fine-Tuning Knob to 90°. We recommend you to do this when the mount is not carrying something.

To adjust the pitch angle from 0° to 90°, the steps are as follows:

Loosen the tension grips on both sides, rotate the altitude adjustment grip clockwise till you can clearly see the hex screws appearing out of the screw holes (approximately 45° latitude scale in Gear 1).

Use the hex wrench to anticlockwise rotate the two hex screws. Make sure they are totally loose before you go to next step.

Pull the mount head, you'll notice the two hex screws are sliding to the bottom place of the inner slideway, while the latitude scale is currently pointing at 45°. Retighten the hex screws on both sides.

Now the mount is at Gear 2, you need to re-tighten the two hex screws to avoid looseness and any possible damage. Gear 2 gives an adjusting range of the latitude scale from 45° to 90°. Don't forget to lock the tension grip after you complete adjusting the latitude scale.

To switch from Gear two to Gear one, just take the above steps in reverse.

3.4.2 How to adjust the azimuth scale?

Loosen the Azimuth locks, then rotate Azimuth adjusting knob to adjust the Azimuth scale.

3.4.3 How to switch the equatorial mode to alt-azimuth mode?

The indicator light is red for equatorial mount mode, and the indicator light is green for alt-azimuth mode.

Tip: Before switching the mode, turn off the power button (shutdown) of the equatorial mount.

Hand Controller Switch

Step 1: Adjust the pitch angle to 90 degrees (refer to 3.4.1 for the steps);

Step 2: Switch from the equatorial mode to alt-azimuth mode

Connect the hand controller, long press the Cancel Button, then turn on the AM3 mount power until the indicator light turns green, then release the Cancel Button to enter the alt-azimuth mode.

Switch from the alt-azimuth mode to equatorial mode

Connect the hand controller, long press the Cancel Button, then turn on the AM3 mount power until the indicator light turns red, then release the Cancel Button to enter the equatorial mode.

Note 1:

After the mount boots, the light indicator will remain the color of the current mode for 5 seconds, then flashes red and green in turn. At this time, you'll need to connect the mount to ASIAIR or any other astrophotography software in your laptop to sync the local time and coordinate information. Otherwise, the mount will not be able to GOTO nor track targets. After synchronization, the indicator light will return to the corresponding position.

Note 2:

When installing the telescope in theodolite mode, please point the telescope lens to the left, as shown in the figure below (when the theodolite is in zero position, the dovetail groove elastic

knob is facing upwards). If the telescope is installed in the opposite direction, it will cause GOTO

and tracking errors when the theodolite tracks the target.

Right installation way:
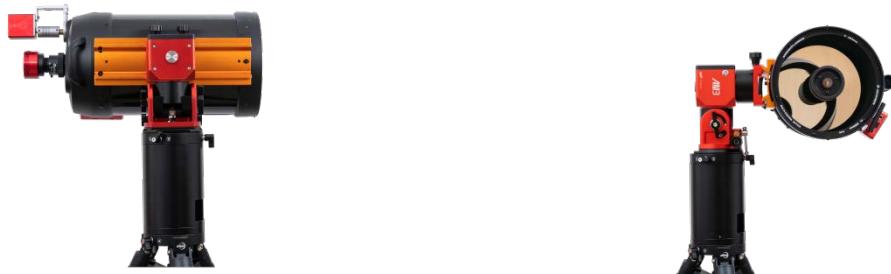
Wrong installation way:

3.5 How to connect the computer to control the equatorial mount?

Preparation: Connect the equatorial mount to the power supply, and use the ZWO USB2.0 data

cable to connect the USB port on the equatorial mount to the USB interface on the computer.

Open the official website http://zwoasi.com/software, select [Technical Support] > [Software].

Click to download [ASCOM driver (optional)]---ASCOM platform①, and then download the

ASCOM driver② .

After the download is complete, double-click to install the ASCOM platform and ASCOM driver,

and complete the operation according to the prompts.

Install the application software that supports ASCOM driver, such as: MaxIm DL, NINA, SGP, etc.,

can control the AM3 equatorial mount. Select ASIMount ① under the corresponding software

equatorial mount, then click 【Properties.】 ②, a new dialog box will pop up.
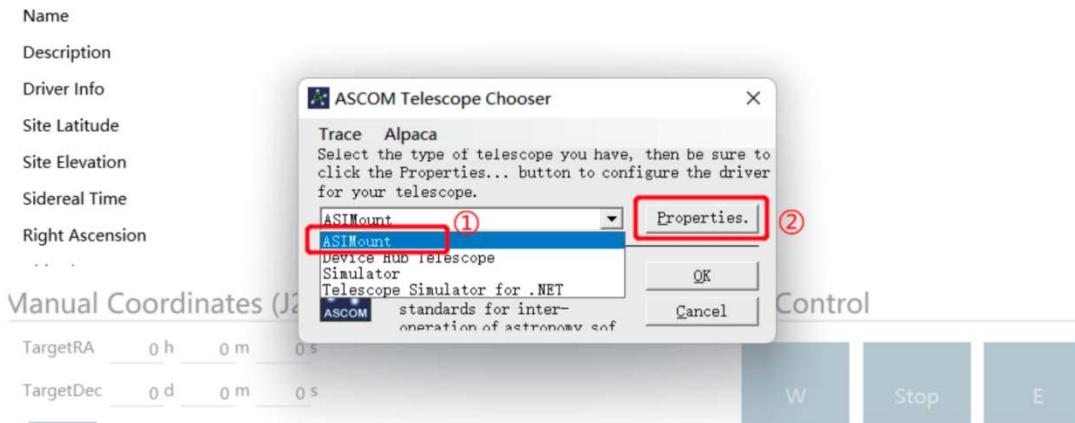
Click the drop-down menu button ① in the new window , select an interface* ② , and then click

[Connect] ③ to connect the mount and the computer.
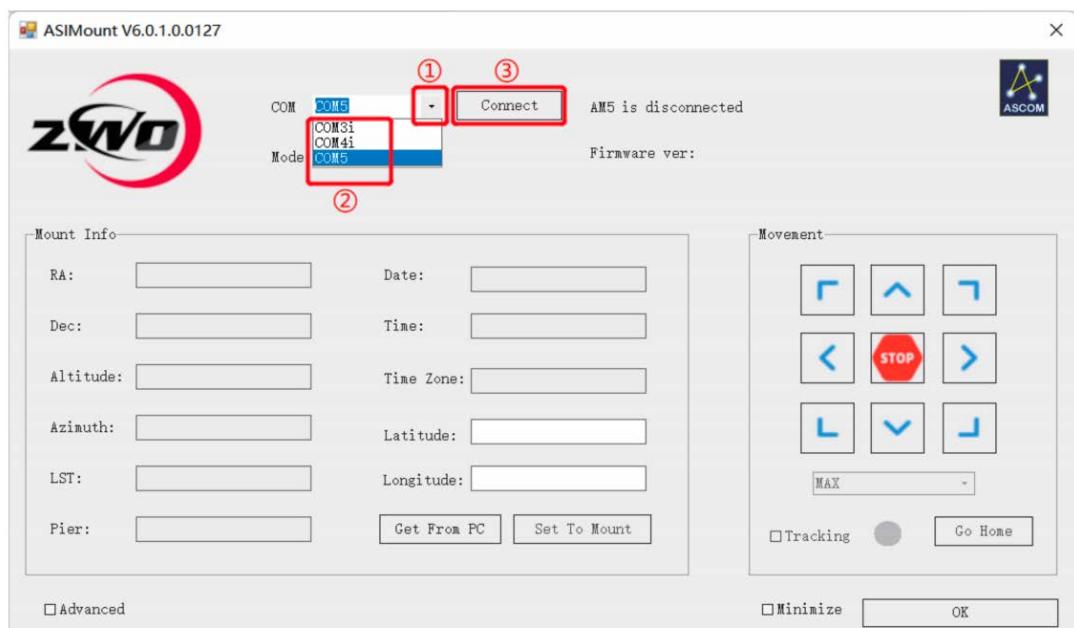
*Note: The selected interface serial number can be found in the computer management, as shown

in the figure below; you can also try to connect one by one.
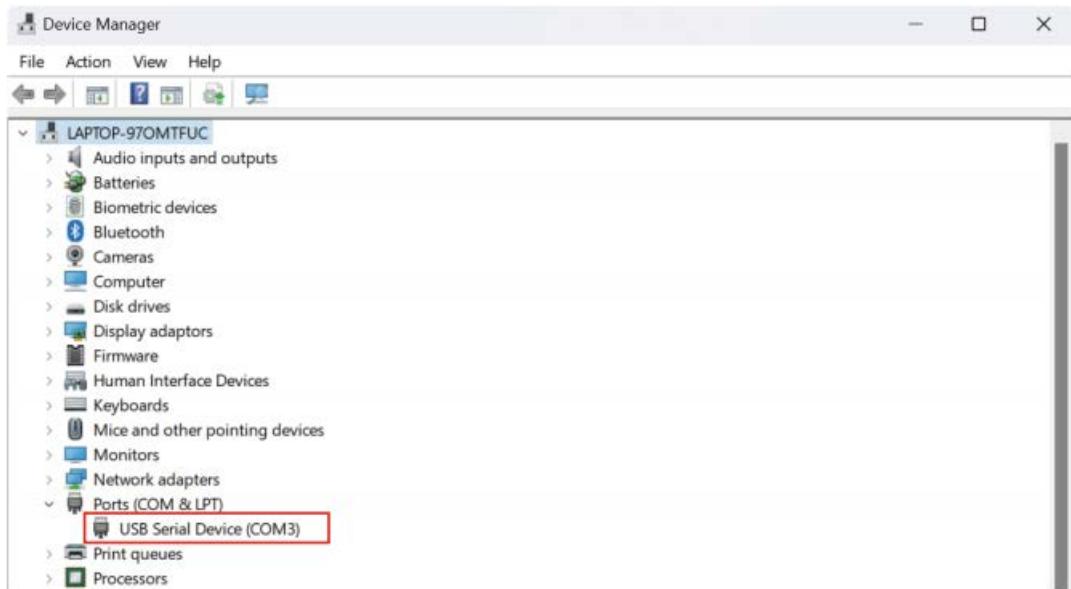
The connection is successful! Press and hold the bearing button to control the movement of the equatorial mount.
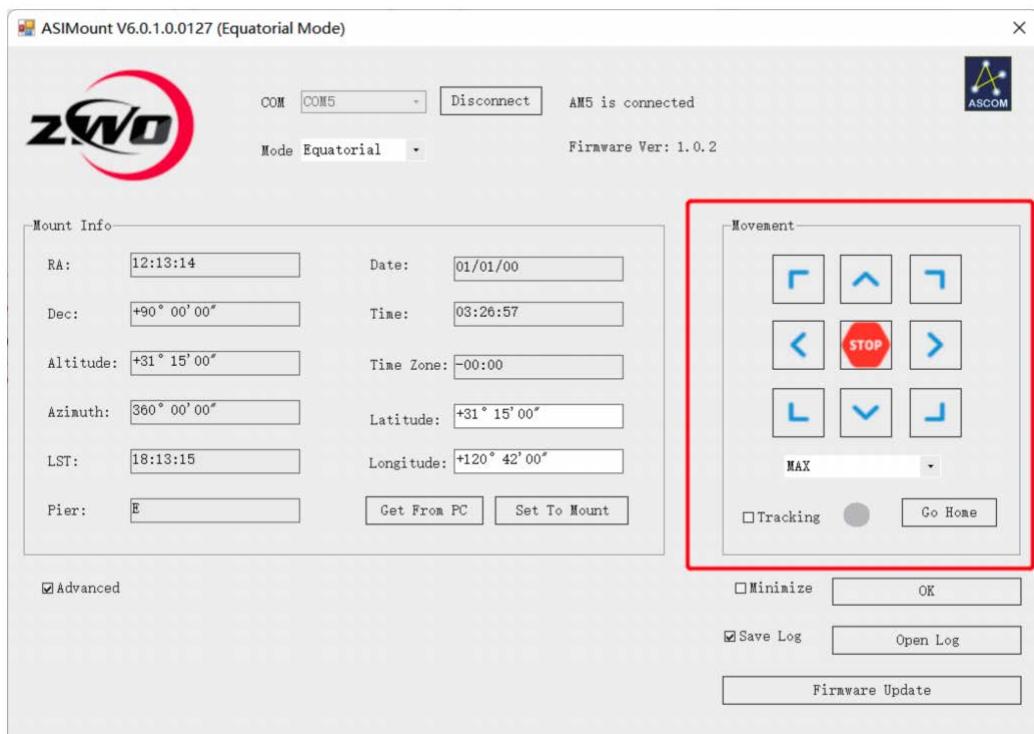

3.6 How to use ASIAIR to control the equatorial mount?

Fix the ASIAIR on the mount body

After the whole system is powered on, select the corresponding ASIAIR wireless signal in the

wireless LAN of the mobile phone.

Open the ASIAIR APP to enter the equatorial mount selection page, select OnStep beta, (Should

be AM3 Mount) and then click the button to start the application. The serial port will show that it

is connected , and the parameters of the corresponding equatorial mount will be displayed on the

page.
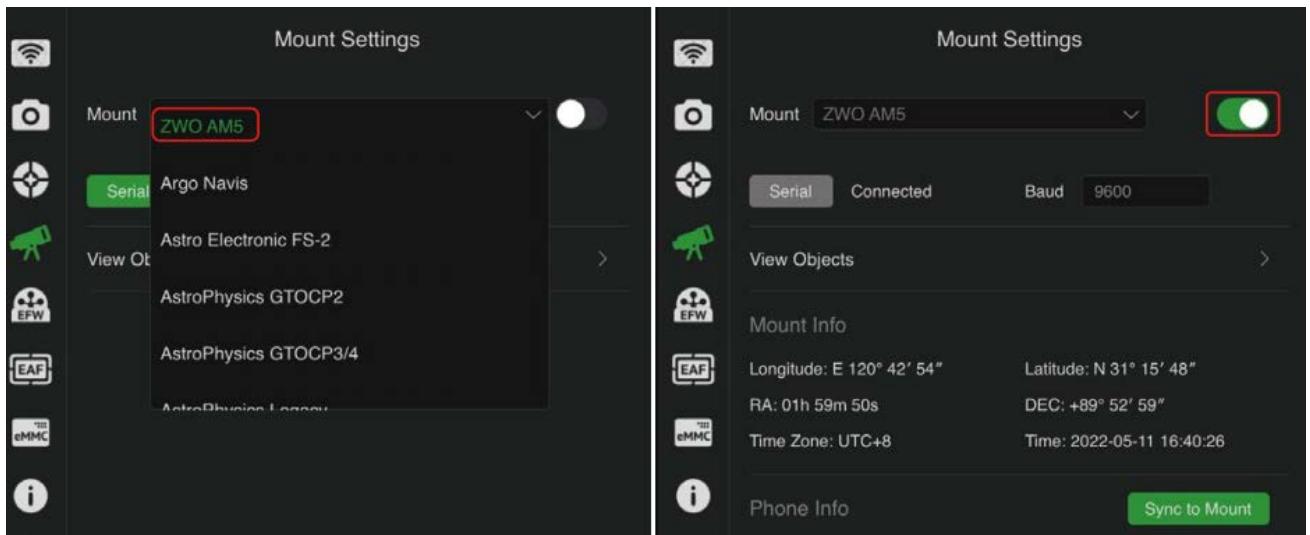
Return to the main page of the APP to set or turn on each device, you can control the equatorial

mount through ASIAIR.
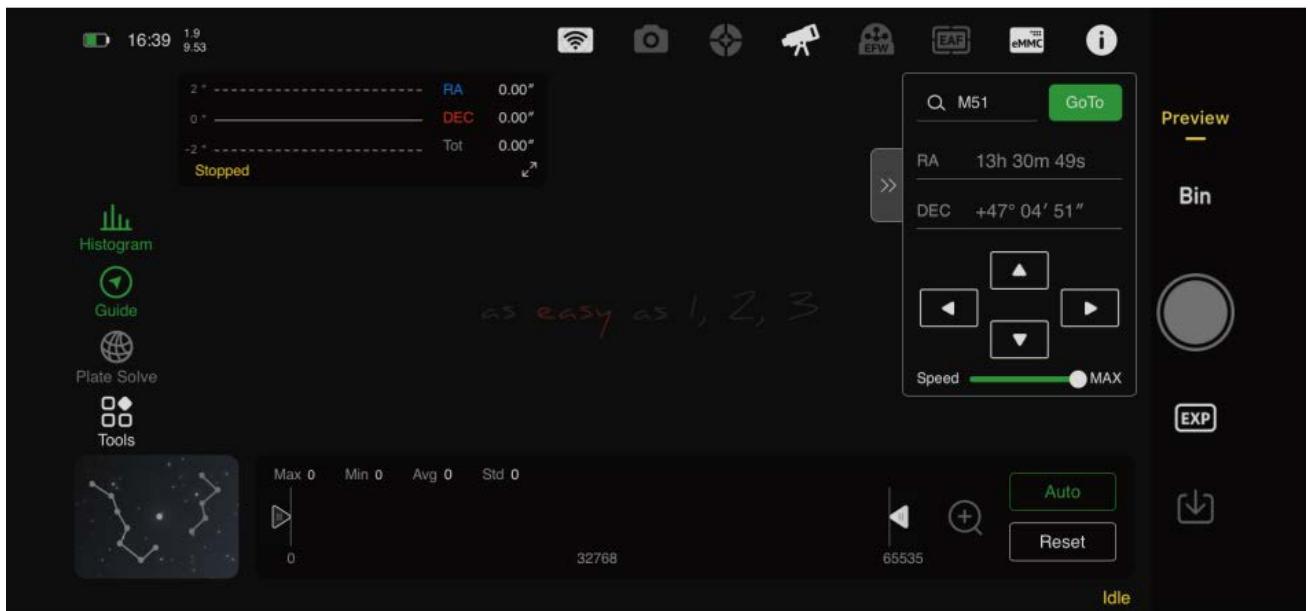
4. Structural Dimensions

比例: 1: 2

5. After sales

https://www.zwoastro.cn
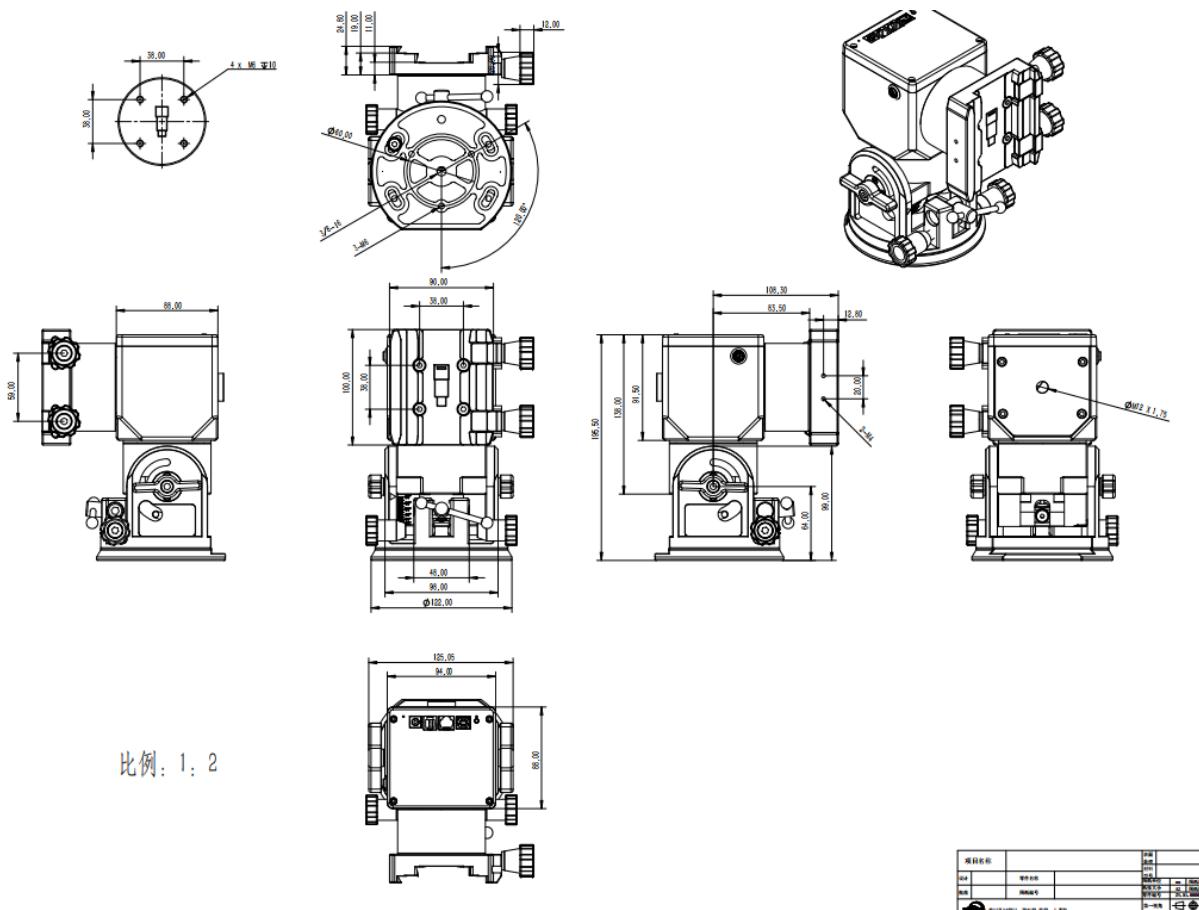
For software upgrade, please download the update directly from the following official website, "

Official Website Homepage - Technical Support - Software ".

https://www.zwoastro.com/downloads

For repairs and other services, please contact us.

Email address: info@zwoptical.com

1. For products that are normally repaired or replaced within the warranty period, the user will

bear the cost of sending them back. When sending back the product, the user should note the

real cause of the product damage and provide corresponding valid proofs, such as pictures or

videos. For products that need to be replaced after being confirmed by ZWO in writing, the user should return the fully packaged product, together with all accessories, manuals, etc., to the address designated by ZWO.

By sending back the product, the user agrees to pay the maintenance fee that may be incurred during the product maintenance process, which is not covered by the warranty service, and ZWO will return the product after payment.

2. For products that need to be sent back for after-sales service, ZWO will provide the corresponding RMA code for reference. ZWO will not accept any product sent back without an RMA number without ZWO's written confirmation.

3. If the user purchased the ZWO product from a ZWO agent, he can directly contact the ZWO agent to obtain relevant after-sales service.

6. Warranty

1. ZWO provides 2-year free warranty service for the products purchased by users from the company, and the warranty period starts from the day after the user receives the product; for AM3 equatorial mount products, the warranty period starts from the activation date of the user's equipment.

2. If the user encounters the following damage-on-arrival (DOA) situations and contacts ZWO within the corresponding period, and issues product purchase invoices and relevant certificates, ZWO will provide free postage service and provide the following products after-sales replacement (or partial replacement), repair or return (or partial return) service:

1) Product quality problem: If the user finds a quality problem with the product within 180 days

from the date of receipt of the product and contacts ZWO, ZWO will provide a free replacement service if the product itself is confirmed to have quality problems or defects after testing by the ZWO customer service center;

2) Product transportation problem: After receiving the product, the user finds that the outer packaging of the product has obvious signs of water soaking or serious backlog and deformation, and shall provide ZWO with pictures of the outer packaging of the product and receipt of the goods within 3 days from the date of receipt of the product After verification by the ZWO customer service center, it is confirmed that the product is directly shipped to the user or agent by ZWO, then ZWO will provide relevant return and exchange services; if the product is directly sold or shipped to the user by the ZWO agent , the ZWO agent will be responsible for providing relevant return and exchange services.

3. If the product occurs in the following situations, it is not within the scope of warranty service, and ZWO can provide maintenance services for users:

1) The product exceeds the warranty period;

2) The product is exposed to liquid and corroded by moisture;

3) The product is damaged by external force (such as scratches on the surface, deformation of the product shell, broken USB port, etc.);

4) Dismantling, third-party maintenance, modification and refurbishment, flashing (downloading wrong firmware) without express written authorization from ZWO;

5) The product system is changed or the warranty label is lost or changed;

6) Product quality problems caused by failure to install according to product usage requirements or instructions;

7) Physical damage and failure of the product caused by irresistible external forces (such as floods, fires, earthquakes, lightning strikes and other strong vibrations or extrusions);

8) Damage caused by improper user operation during shooting or use;

9) There is no valid product purchase invoice and warranty certificate;

10) The product purchased by the customer is a second-hand product.

Quality problems with accessories or other parts of the product are not a condition for returning the host, and users can request replacement of new accessories separately.

FCC Statement

Any Changes or modificationsnot expressly approved by the party responsible for compliance couldvoid the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1)This device may not cause harmful interference,and (2) this device must accept any interference received, including interference that may causeundesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device,pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protectionagainst harmful interference in a residential installation. This equipment generates, uses and canradiate radio frequency energy and, if not installed and used in accordance with the instructions,may cause harmful interference to radio communications. However, there is no guarantee thatinterference will not occur in a particular installation. If this equipment does causeharmful interference to radio or television reception, which can be determined by turning

theequipment off and on, the user is encouraged to try to correct the interference by one or more ofthe following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver isconnected.

—Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.