

Askar

WAF 电动调焦器

详细版使用说明书
Detailed User's Manual

www.sharpstar-optics.com

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1. Important Notes

Before using the Askar WAF, please ensure that you have read this manual thoroughly and in full. Strictly follow the instructions and guidelines provided to ensure safe and stable operation of the device.

1.1 Load Capacity Limit

The rated equivalent load of the WAF is 20 kg. Fitting accessories exceeding the rated weight is strictly prohibited to prevent equipment damage.

1.2 Power Supply Specifications

This unit is supplied with a 12V power cable. Please use a power adapter that meets the specified requirements. The use of incompatible power supplies is strictly prohibited.

1.3 Abnormal Condition Warning

If the device emits continuous, high-pitched beeping alarms during operation, immediately disconnect the 12V power supply cable and inspect the load and focusing status. Sustained overload operation will cause permanent damage to the equipment.

1.4 No Disassembly by Unauthorized Personnel

Do not disassemble the unit unless you are an authorized service technician. In the event of a malfunction requiring repair, please contact the official Sharpstar Optics after-sales support team.

2. Product Introduction

The Askar WAF is a high-precision, professional focusing device designed specifically for astronomical observation and deep-sky astrophotography.

Featuring a universal structural design with a multi-functional adjustable socket, the WAF is compatible with the vast majority of telescope focusers on the market, offering broad compatibility.

The quick-release design enables fast installation and removal without complex tools or tedious steps, greatly simplifying the equipment setup process.

Fully supports ASCOM Alpaca and all ASCOM Alpaca-compatible third-party software (e.g., N.I.N.A.), enabling autofocus for deep-sky astrophotography with mainstream imaging software. No additional driver is required – the WAF is plug-and-play with N.I.N.A., greatly improving imaging and observation efficiency. The device also supports the INDIGO protocol system; when using that system, please install the corresponding driver in advance.

Built with a high-torque, high-precision stepper motor and a precision worm-and-gear transmission, the WAF delivers ample torque for focusing. It accurately executes minute step movements, achieving micron-level positioning accuracy, meeting the stringent precision requirements of professional astrophotography.

Optimized and upgraded for scenarios with multiple accessories and heavy equipment, the WAF supports a maximum load of 20 kg, outperforming comparable products. The entire mechanism runs with low noise and no stuttering, providing smooth, stable focusing and long-lasting durability.

The device is equipped with a 12V power port and a Type-C data port, supporting both wired and wireless operation modes to flexibly adapt to different usage scenarios and equipment setups.

In wired mode, simply connect the Type-C cable directly to a computer – no local network required. Truly plug-and-play, simple and efficient.

Wireless mode offers greater flexibility; control can be performed from a mobile phone or computer, enabling remote control within a local network.

On the mobile side, the dedicated Askar APP allows wireless control – precise and responsive focusing, stop on release, with independently adjustable travel and step size. One-tap focusing completes the operation. During visual observation, there is no need to touch the device, making outdoor use flexible and hassle-free.

The APP features personalized management functions, supporting custom device naming and multi-device grouping for unified equipment control. It also supports step parameter fine-tuning, travel reversal, and other custom settings, adapting to individual habits to create a personalized focusing experience.

The entire unit features a metal body with classic matte black as the main color, complemented by a fine sandblasted texture for a skin-friendly grip. The body is laser-engraved with the exclusive "Askar | WAF" logo – simple and elegant, combining professional quality with strong brand identity.

3. WAF Specifications

Motor Type: Worm-gear stepper motor

Gear Reduction Ratio: 1:99

Minimum Resolution: 0.0182°

Maximum Output Torque: 20kgf·cm

Equivalent Load: 20kg

Output Speed: 2.6rpm

Power/Data Interface: DC-044 12V / Type-c

Input Current: 1A min

Body Dimensions: 101mm×47mm×43mm

Body Weight: 373g

Communication Protocol: ASCOM Alpaca and Indigo

Supported Software: Askar APP, ASCOM Alpaca third-party platform software (e.g., N.I.N.A.)

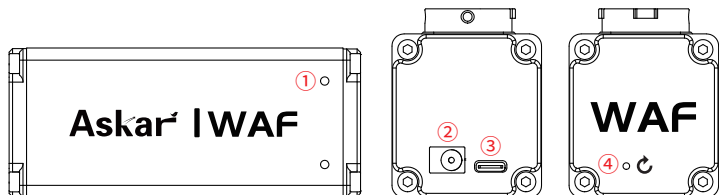
* We will continue to expand the compatible communication protocols and supported software. For updates, please follow Sharpstar Optics official website.

4. Compatible Telescope Focuser Models

The WAF features a universal structural design with a multi-functional adjustable socket, compatible with the vast majority of telescope focusers on the market. Supported models include:

Brand	Focuser Model
Askar / Sharpstar	Full series of focusers
Sky-Rover	Full series of focusers
Sky-Watcher	Newtonian series, DOB series focusers
Others	German TS refractor focusers, Astro-Tech focusers

5. Introduction to Appearance and Functions



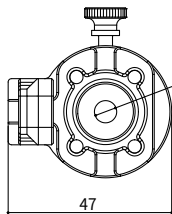
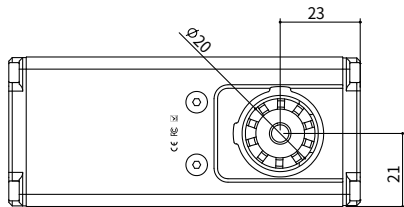
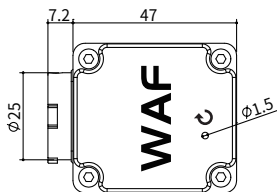
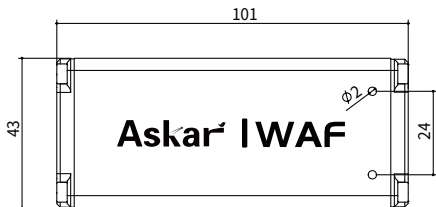
① **Status indicator:** After powering on, the status indicator will show a steady green light when the device is properly connected. If the device emits a continuous, sharp beeping alarm and the indicator turns red, immediately disconnect the 12V power supply, check the load and focuser operation. After troubleshooting, power on the device again.

② **12V power input port**

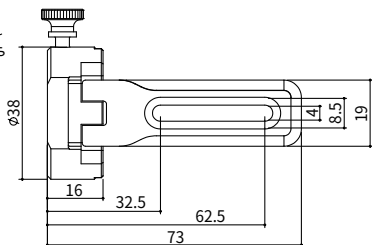
③ **Type-C data interface**

④ **Reset button:** Use the included network reset pin to press and hold the reset button for 3 seconds to reset the network. The device will emit two beeps to indicate that the network reset is complete.

6. Product Dimensions (Unit:mm)



$\phi 5, \phi 6, \phi 7$
Three specifications
are available for
replacement



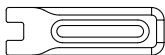
7. Package Contents



WAF body



2mm / 3mm hex key



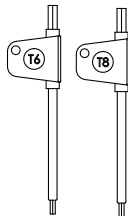
Connecting bracket



M4×10
black cap head
screws*2



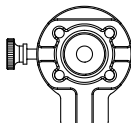
Network
reset pin



T6 / T8 Torx wrench



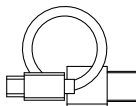
Gear mount
(5mm inner bore)



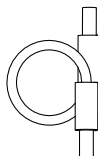
Socket
(6mm inner bore)



Gear mount
(7mm inner bore)



Type-C cable (1m)



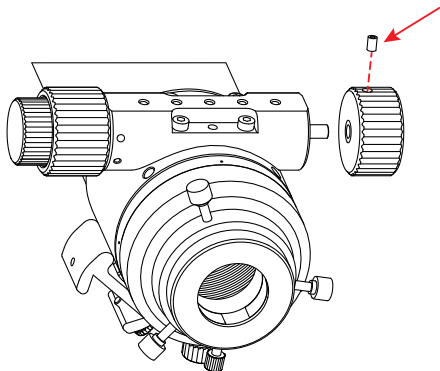
12V cable (1m)



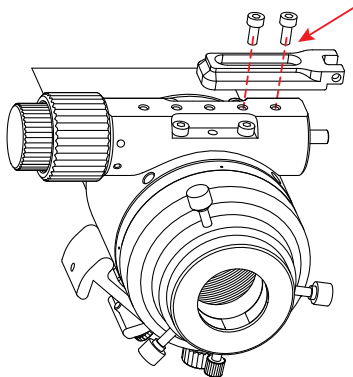
User manual

8. WAF Installation Instructions

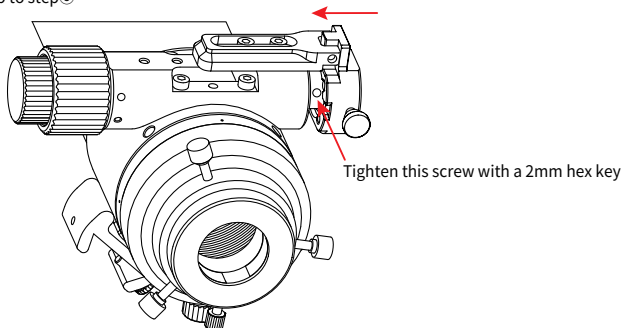
- ① Use the appropriate wrench to remove the coarse focus knob from your telescope focuser



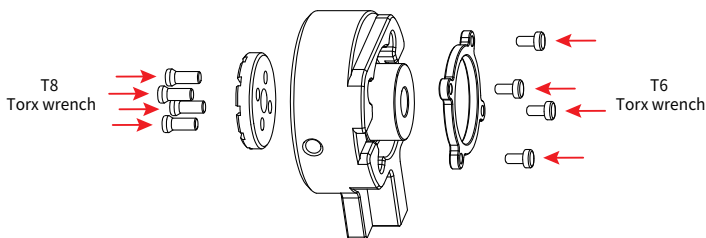
- ② Insert the M4 screws into the indicated holes on the connecting bracket without fully tightening



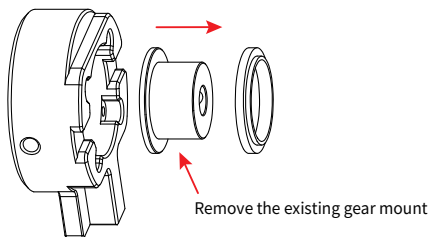
- ③ Select the appropriate gear mount size for the socket, insert the socket into the focuser shaft, and tighten the locking screws using a 2mm hex key
- *The package includes three gear mount sizes $\varnothing 6$ 、 $\varnothing 7$ 、and $\varnothing 8$. The unit is factory-pre-installed with the Sharpstar universal $\varnothing 6$ model. If replacement is needed, proceed to step ④; if not, skip to step ⑥



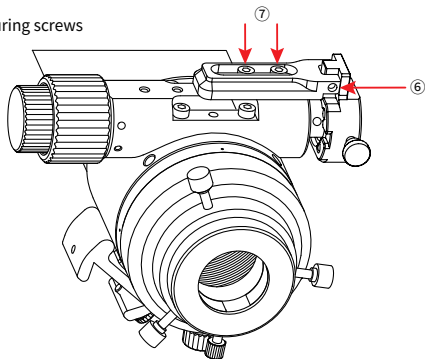
- ④ To replace the gear mount, use a T6 Torx wrench to remove the four external securing screws on the socket, then use a T8 Torx wrench to remove the four internal securing screws



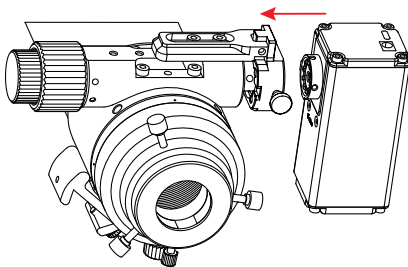
- ⑤ Remove the existing gear mount and install the matching gear mount according to the actual shaft size of your focuser



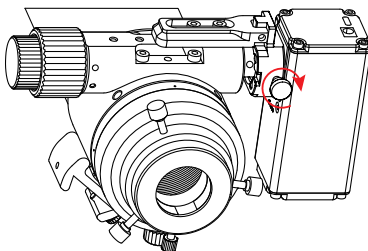
- ⑥ Use a 2mm hex key to tighten the locking screws between the socket and the connecting bracket
- ⑦ Tighten the M4 securing screws



- ⑧ Insert the WAF body into the socket in parallel or perpendicular orientation, and adjust the coarse focus knob until the body fits securely against the socket



- ⑨ Tighten the securing screws. Hardware installation of the WAF is now complete



9. Operation Guide

The WAF supports software control via mobile and PC devices, enabling parameter settings and focusing for deep-sky astrophotography. The WAF is compatible with the Askar APP, developed by Sharpstar Optics. In addition, it supports ASCOM Alpaca and a wide range of third-party software that is compatible with ASCOM Alpaca (e.g., NINA). This allows the WAF to meet various control and imaging needs across different scenarios.

The following sections describe the two operation modes: wired mode (NINA) and wireless mode (Askar APP).

9.1 Wired Mode – NINA

9.1.1 Download and Installation

9.1.1.1 Download and Install NINA

Go to the Sharpstar Optics official website → Product page of the WAF → Download → Download and install NINA.

*If NINA V3.0 or higher is already installed locally, no re-download or re-installation is required.

9.1.1.2 Additional Software

For other third-party software that supports ASCOM Alpaca or is ASCOM Alpaca-compatible, users need to download and install them from the respective official channels themselves.

9.1.2 Preparation

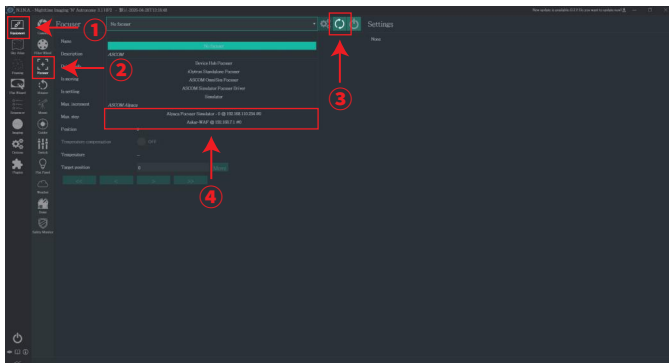
Before using the NINA autofocus function, please complete the telescope setup by properly connecting the camera, the WAF, and other devices, and enable the mount tracking mode. Then, manually adjust the telescope focuser to bring a star to approximate focus, so that the star image appears reasonably sharp.

9.1.3 Connecting the Device

Open the main interface of NINA, go to ① Devices — ② Electronic Focuser

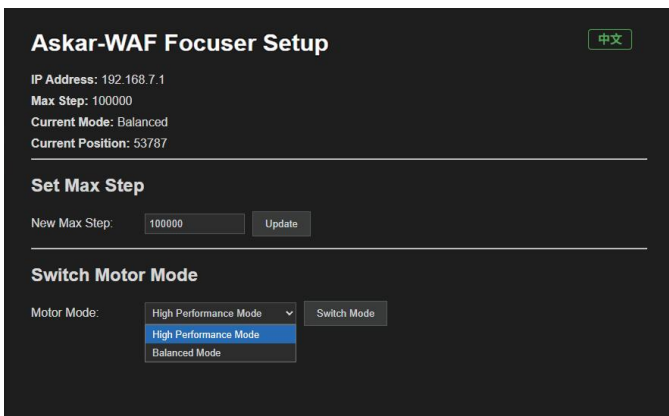
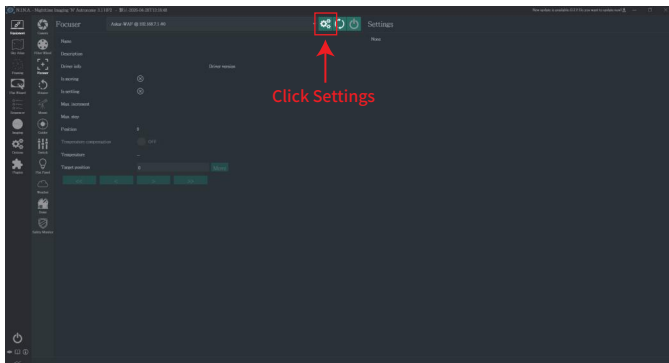
③ click Scan Devices.

④ In the ASCOM Alpaca device list that appears, select Askar-WAF.



9.1.4 Parameter Settings

After selecting the device, click Settings and wait for the parameter configuration interface to load. Here you can modify the Maximum Travel, Operation Mode, Reverse Motion, and switch the language.



The parameter configuration interface will appear after the page loads

9.1.4.1 Modifying the Maximum Travel

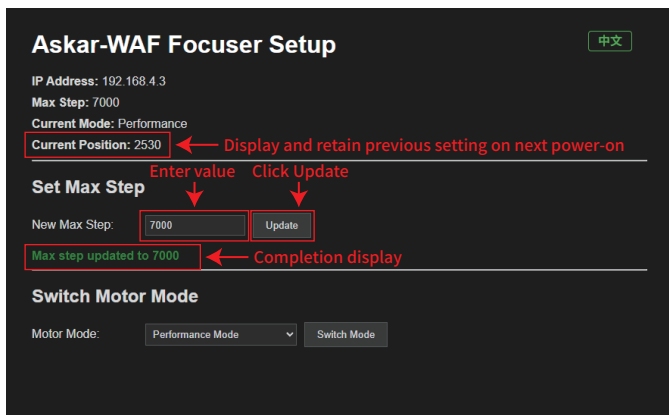
① The WAF factory default total travel is 100,000 steps. After power-up, the device initially positions itself at the midpoint (50,000 steps). You can change the maximum travel as needed, with a settable range of 100 to 1,000,000 steps.

② Set the maximum travel parameter according to the actual focuser travel of your telescope.

(Reference conversion: Step 19,800 = one full rotation of the WAF output shaft = one full coarse-focus rotation of the focuser.)

③ Enter the desired maximum travel value (Max Step) and click Update. A green prompt reading "Maximum travel has been updated to" will appear, indicating the setting is complete. You may then close the configuration page. The new value will be used as the maximum travel the next time the device is powered on (see Figure 1).

④ If a red prompt appears, adjust the maximum travel parameter according to the on-screen instructions. To confirm whether the modification was successful, refer to the criteria described in step ③ (see Figure 2).



(Figure 1)

Askar-WAF Focuser Setup

[中文](#)

IP Address: 192.168.4.3

Max Step: 6000

Current Mode: Performance

Current Position: 2530

Set Max Step

New Max Step:

Value must be between 2530 and 1000000



Switch Motor Mode

Motor Mode:

Performance Mode



(Figure 2)

9.1.4.2 Operation Mode

The device offers two operation modes: Balanced and High Performance, which can be switched as needed. Upon successful switching, a green prompt reading "Mode switch successful" will appear, indicating the setting is complete. You may then close the configuration page.

- **Balanced Mode:** Rated load capacity is 15 kg. Operation is smooth and stable. Suitable for most regular observation and astrophotography scenarios. This is the recommended mode for everyday use.
- **High Performance Mode:** Rated load capacity is 20 kg. Designed for heavier equipment. In this mode, the motor carries a higher load and generates some heat during operation.

Askar-WAF Focuser Setup

中文

IP Address: 192.168.4.3
Max Step: 7000
Current Mode: Performance
Current Position: 2530

Set Max Step

New Max Step:

Max step updated to 7000

Switch Motor Mode

Motor Mode: Performance Mode

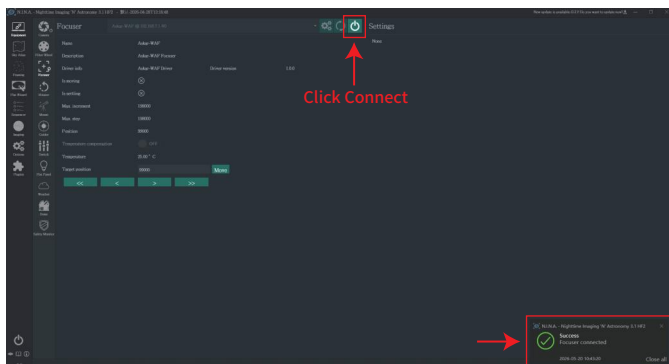
Mode switched successfully

9.1.4.3 Reverse Motion

When this function is enabled, the motor rotation direction of the WAF focuser will be reversed.

9.1.5 Autofocus Settings

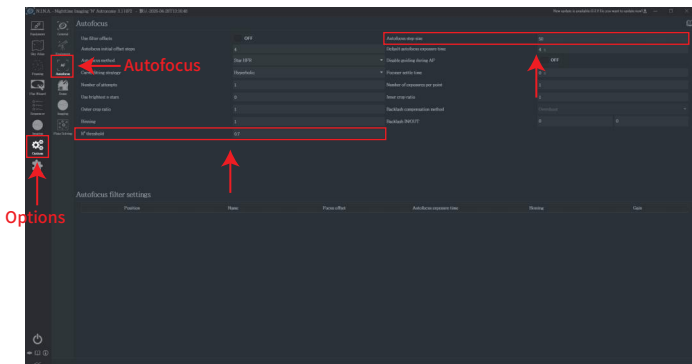
After completing the above settings, click Connect. Upon successful connection, a confirmation pop-up will appear in the lower-right corner.



9.1.5.1 Detailed Steps

After the device is connected, go to Options → Autofocus to configure the relevant autofocus parameters.

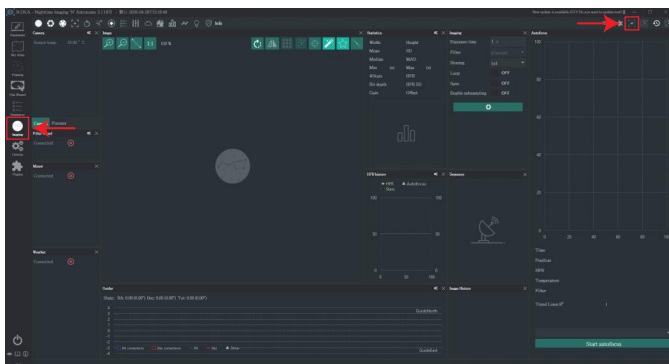
- **Adjust the R^2 threshold**: This value ranges from 0 to 1. Closer to 1 indicates higher reliability. A recommended setting is 0.8.
- **Adjust the autofocus step size**: For the first autofocus of a session, a recommended value is 1000. You can increase it (if autofocus fails) or decrease it (if you are closer to optimal focus) based on the results.



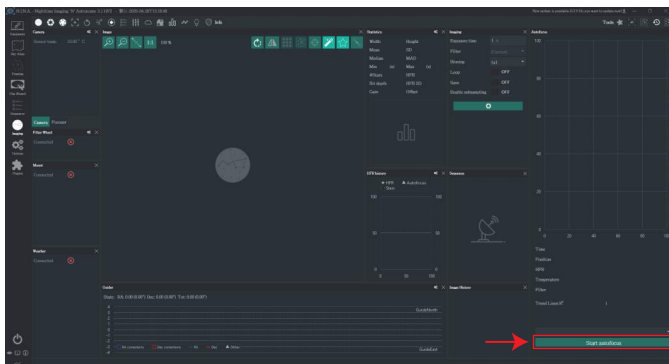
9.1.6 Autofocus

After all autofocus-related parameters are set, return to the main control panel to perform autofocus.

- ① Click the Main Control panel and open the autofocus interface.



- ② Click Start Autofocus and wait for the process to complete.



- ③ Once autofocus is finished, the WAF will automatically move to the focus position. From there, you can proceed with scheduled imaging.

9.2 Wireless Mode – Askar APP

9.2.1 Download and Install Askar APP

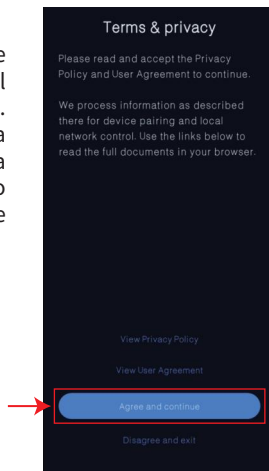
- **For Android users (8.0 or above):** Go to the official Sharpstar Optics website → Product page of the WAF → Product Download → download and install the Askar APP.
- **For iOS users (13.0 or above):** Go to the App Store, search for "Askar", and download/install the APP.

9.2.2 Preparation

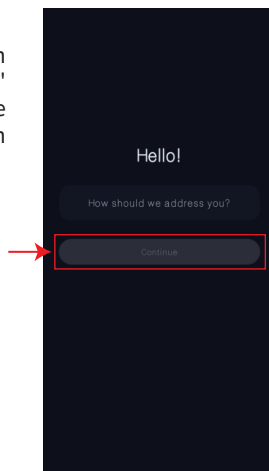
Before using the Askar APP focusing function, please complete the telescope setup by properly connecting the camera, the WAF, and other devices.

9.2.3 First Launch of Askar APP

① If you have not yet agreed to the current version's legal terms, you will enter the "Terms and Privacy" page. This page cannot be dismissed with a back gesture; you must make a selection. Tap "Agree and Continue" to save your consent and proceed to the next step.



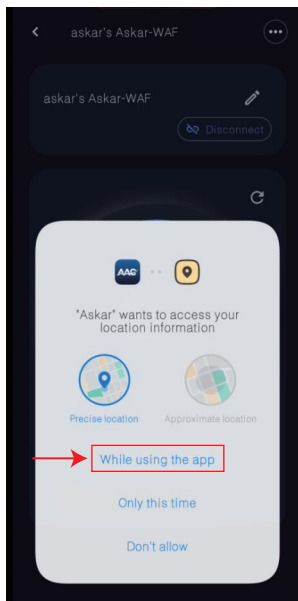
① If no username has been saved on this device, the welcome page "Hello!" will appear. Enter a valid username and tap "Enter" to go to the main interface.



9.2.4 Permission Requests

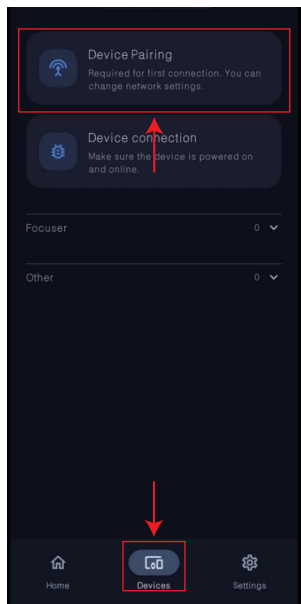
③ When opening the Device Pairing page for the first time, the APP will request permission. Select Allow. If the permission was previously denied or permanently rejected by the system, go to system settings to enable the permission for the Askar APP and try again.

④ When connecting the device for the first time, the system will request location permission. Grant the permission, then you can control the device.

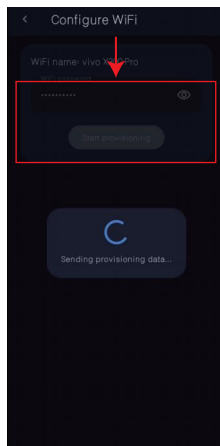
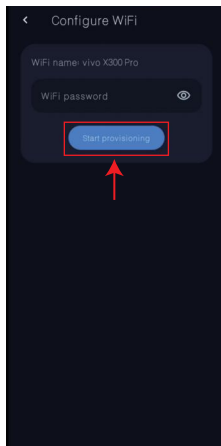
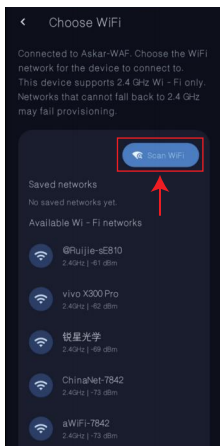


9.2.5 Device Pairing

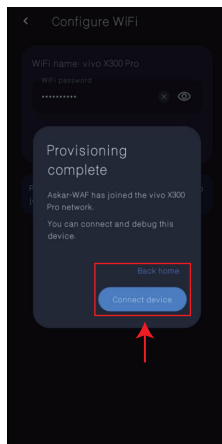
① Go to the main menu Devices page, tap Device Pairing to enter the Scan Device page. Authorize and select the device Askar WAF.



② After selecting the device, the page will switch to Select Wi-Fi. Wait for the device to return the Wi-Fi list. You can tap Scan Wi-Fi to refresh again, choose an available Wi-Fi network, enter the password, and tap Start Pairing.



③ Wait for the pairing process to complete. You can either select Return to Home to finish the pairing process, or directly tap Connect Device to start controlling the device.

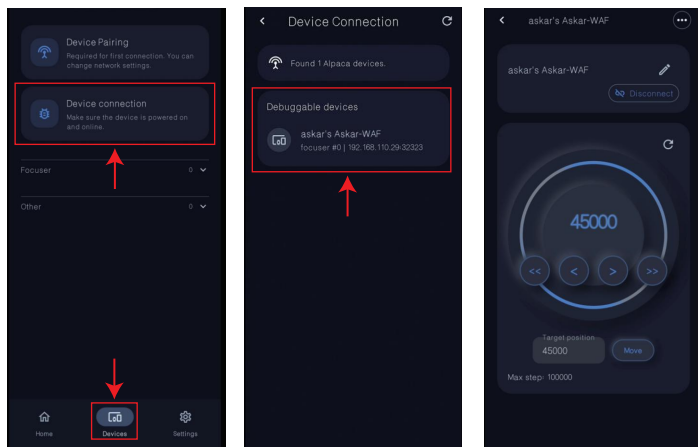


9.2.6 Device Connection

9.2.6.1 Tap "Return to Home"

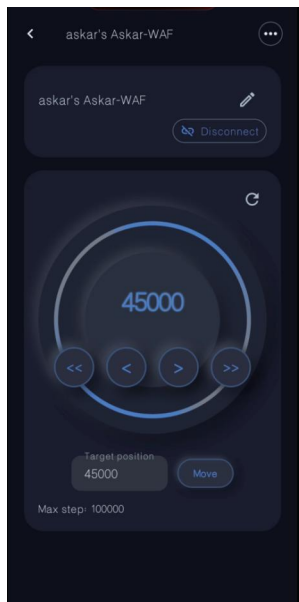
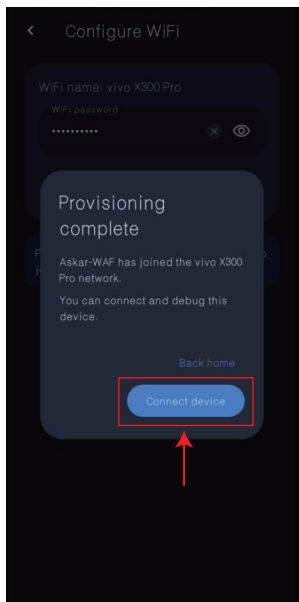
If you choose Return to Home after pairing, you can access the device control page via the following steps:

Go to the main menu Devices page, tap Device Connection to enter the device connection page. Wait for the device list to refresh, select the target device, and the corresponding control interface will appear. The username entered on the "Hello!" welcome page will become the device prefix.



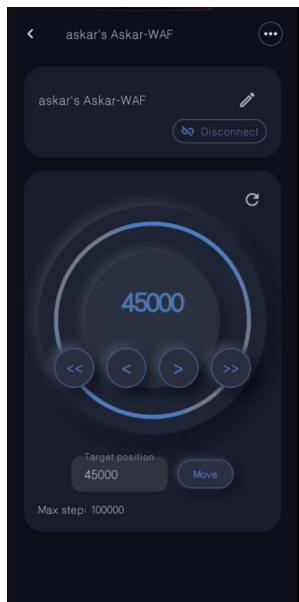
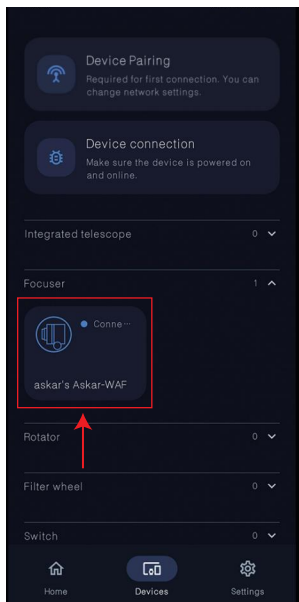
9.2.6.2 Tap "Connect Device"

After pairing, if you select Connect Device, it will directly take you to the control interface of that device.

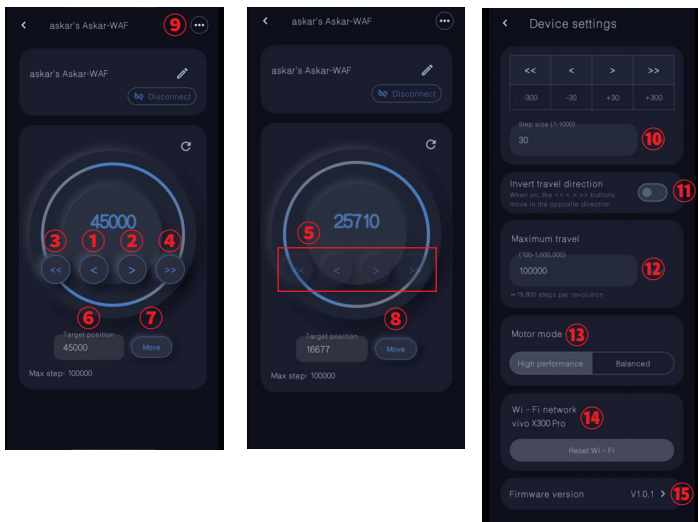


9.2.6.3 Quick Re-entry to Device

Once the device has been successfully connected for the first time, the system will automatically generate a device card on the main menu Devices page. The new card will be placed in the appropriate device category and will display the online status. For subsequent use, simply tap the WAF focuser card to quickly enter the control interface.



9.2.7 Electronic Focuser Control and Settings



① and ②: Perform single-step fine adjustments, suitable for precise focusing. Button ① rotates clockwise by default, Button ② rotates counterclockwise by default.

③ and ④: Perform continuous stepping, suitable for fast movement. Button ③ rotates clockwise by default, Button ④ rotates counterclockwise by default.

⑤: If the mechanical limit has been reached in one direction or the device is currently running, the corresponding operation buttons will be grayed out and temporarily disabled.

⑥ **Target Position:** Enter the desired target position.

⑦ **Move:** Move to the target position.

⑧ **Stop:** Tap this button to perform an emergency stop during movement.

- ⑨ **Device Settings:** Tap to enter the device settings interface.
- ⑩ **Step Value:** Adjust the step size (default 30, adjustable from 1 to 1000).
- ⑪ **Reverse Travel:** When enabled, the motor rotation direction is reversed. The four operation buttons ("<<", "<", ">", ">>") will move in the opposite direction.
- ⑫ **Maximum Travel:** Modify the maximum travel value of the device. The setting range is 100 to 1,000,000 steps.

*For specific calculation method, refer to section 9.1.4.1 Modifying the Maximum Travel

- ⑬ **Motor Mode:** Switch between High Performance Mode and Balanced Mode.

- **Balanced Mode:** Rated load capacity is 15 kg. Operation is smooth, and stable. Suitable for most regular observation and astrophotography scenarios. This is the recommended mode for everyday use.

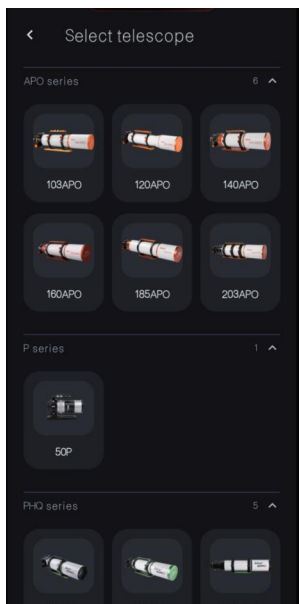
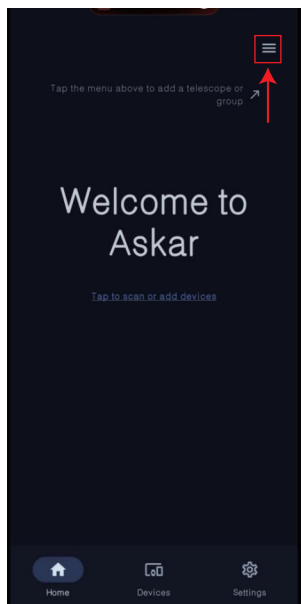
- **High Performance Mode:** Rated load capacity is 20 kg. Designed for heavier equipment. In this mode, the motor carries a higher load and generates some heat during operation.

- ⑭ **Reset Wi-Fi:** Reconfigure Wi-Fi settings for pairing.
- ⑮ **Firmware Version:** Perform OTA firmware updates.

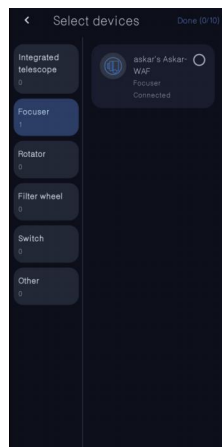
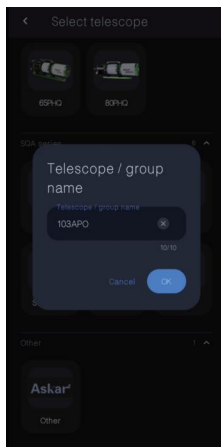
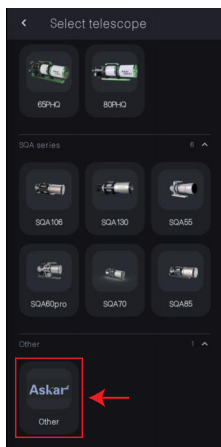
9.2.8 Custom Settings

9.2.8.1 Device Grouping

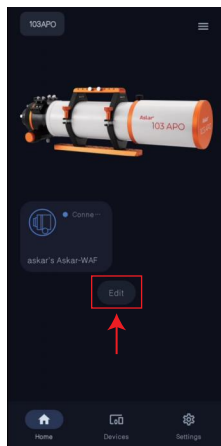
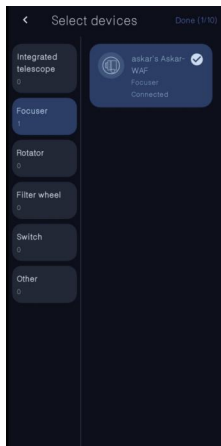
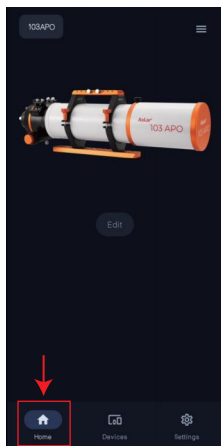
① On the main menu Home page, tap the three horizontal lines in the upper right corner to enter the Select Telescope page.



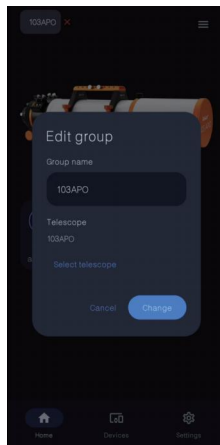
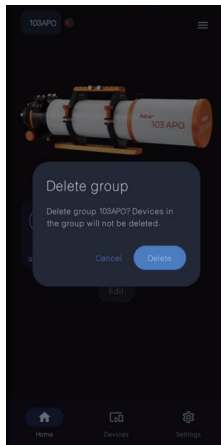
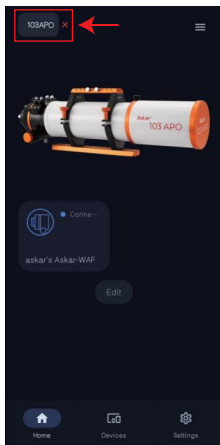
② Select an Askar telescope or customize your own. Choose Others and enter a group name. Within the group, you can Select Devices. After selection, tap the Done button in the upper right corner to return to the Home page and view the device card.



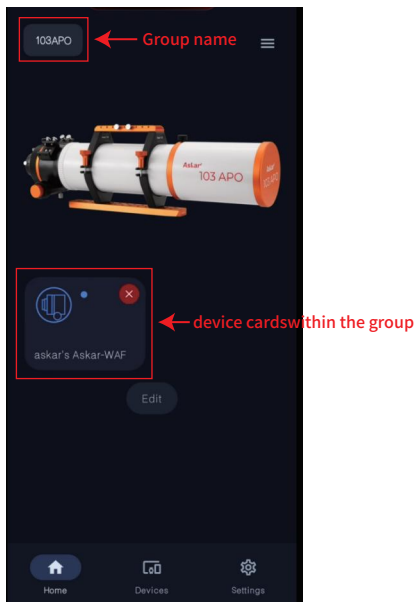
③ On the main menu Home page, view the group cards. Tap the Edit button inside a group card to re-enter the Select Device page and adjust group members. Selected devices will be displayed within the group.



④ Long press the group name at the top of the group card to enter edit mode. Tap the red X button on the right to delete the corresponding group. Tap the group name area to edit the group information.

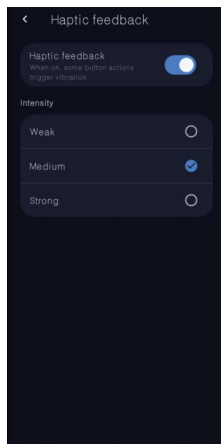
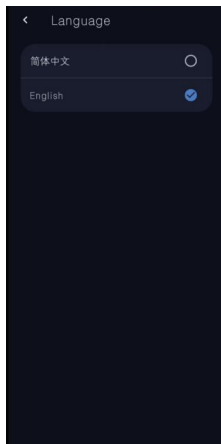
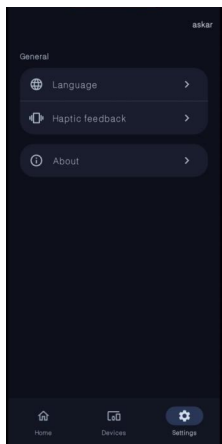


⑤ Long press any device card within the group to enter the edit mode for devices in that group. You can delete devices or adjust their order within the group.

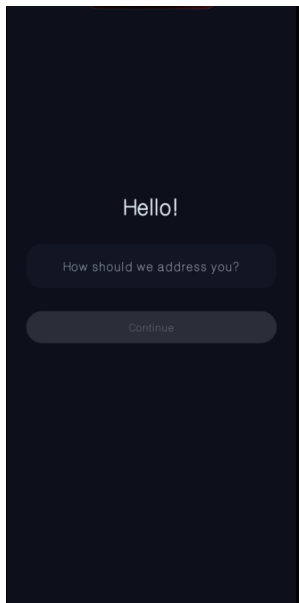
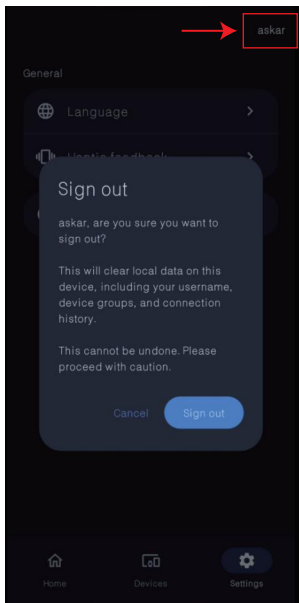


9.2.8.2 Settings Interface

- **Language:** Supports switching between Chinese and English.
- **Haptic feedback:** Freely enable/disable vibration and adjust vibration intensity.



- **Logout:** Long press the username in the upper right corner to bring up the logout confirmation dialog. After confirmation, the local cache will be cleared and the welcome page will be displayed.



9.2.9 Troubleshooting

9.2.9.1 Wi-Fi Pairing Failure

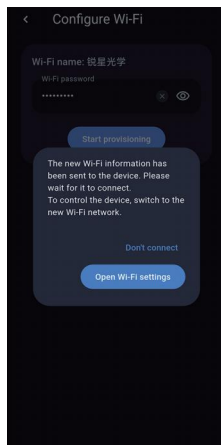
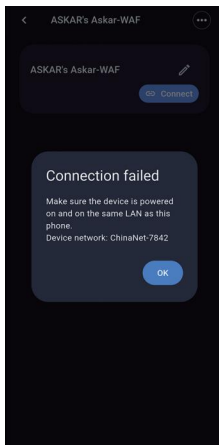
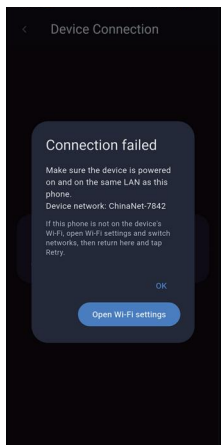
Symptoms: No feedback for a long time or a failure notification pops up after submitting Wi-Fi information.

Solutions: First check whether the Wi-Fi username and password are correct, and move the device closer to the router. If the problem remains unresolved, press and hold the Reset button for 5 seconds to reset the network, then redo the Wi-Fi pairing after the device restarts.

9.2.9.2 Connection Failure

Symptoms: Failed to connect to the device, which may result from the software and the device not being connected to the same local area network.

Solutions: Follow the on-screen instructions to open Wi-Fi settings, and switch the current Wi-Fi network to match the LAN the device is connected to.





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