Seestar S50 Pro

User Manual

ZWO × Seestar

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Preface

Thank you for purchasing the Seestar S50 Pro Smart Telescope.
Since the launch of the Seestar series in 2023, ZWO's smart telescopes have quickly gained popularity among astronomy enthusiasts worldwide for their ease of use, portability, and affordability. Building on the success of the original Seestar, ZWO has continued to refine and enhance the product, introducing the Seestar S50 Pro with improved performance and expanded capabilities. Designed for a broader range of astronomy enthusiasts, the Seestar S50 Pro makes exploring and capturing the beauty of the night sky easier and more enjoyable than ever.

Seestar is ZWO's brand of smart astronomical equipment. The Seestar S50 Pro is an all-in-one smart astrophotography solution that integrates an alt-azimuth mount, telescope, astronomy camera, wide-angle camera, filters, onboard controller, and image processing into a single compact and elegantly designed device. With the Seestar app, users can quickly locate and track celestial objects, view the live image through the telescope, and access information about their observation targets. This intuitive workflow makes it easy for users to enjoy astronomical observation, astrophotography, and astronomy outreach activities.

The purpose of this manual is to provide users with instructions for operating the Seestar S50 Pro Smart Telescope through clear text and illustrations, while highlighting potential hazards and improper operations that should be avoided. Please read this manual carefully before using the telescope and follow all instructions provided. Failure to operate the product properly may result in damage to the device or personal injury, for which the user assumes full responsibility.

Important Reminder

This manual provides guidance for safe and efficient use of Seestar. Before using the device, please thoroughly read the following reminders and strictly adhere to the instructions during use. This manual may be updated. For the most recent instructions, please refer to the online manual available at https://www.zwoastro.com/

1. Do not observe the sun directly without using the solar filter, as this will cause irreversible damage to the device.

2. Minors must use this product under adult supervision.

3. To charge this device, only use chargers from reputable manufacturers. ZWO is not responsible for damage caused by unqualified chargers. (Charger requirements: supports USB BC1.2; supports 5V 2A in normal mode and up to 12V 3A in fast charge mode).

4. Products that have been disassembled or modified without authorization will not be covered by the warranty.

5. This product is a precision electronic instrument. Do avoid exposure to water or dust, and store it properly when not in use.

6. Do not allow the lens to come into contact with glass windows, fabric, eyeglass cloth, or liquids. Only use specialized optical lens wipes for cleaning.

7. We recommend using the product under an environmental temperature range of -10°C ~ 40°C.

8. Do not use chemical solvents (e.g., alcohol, thinner) or other stratified cleaning fluids to clean the product or its accessories.

9. Keep the product away from open flames to prevent battery explosion.

10. Battery capacity may degrade at lower temperatures due to the natural properties of lithium batteries, which is normal.

11. Store the product in a clean, dry place (recommended storage conditions: temperature below 60°C, humidity below 50%). During thunderstorms or prolonged periods of non-use, please turn off and properly store the device.

12. Do not use the product in weather conditions where wind speeds exceed Force 3 on the Beaufort scale.

13. Seestar products are available in Mainland China and International versions. The Mainland China version can currently be activated only in Mainland China, Hong Kong SAR, and Macao SAR. Activation is not supported in other regions, and products activated or used outside the supported regions are not eligible for warranty service.

1. Product Overview

1.1 Overview

The Seestar S50 Pro combines accessibility, portability, intelligent automation, and professional-level performance in a single compact device. It simplifies the traditionally complex workflow of astrophotography, making it an ideal choice for beginners while providing powerful capabilities for more experienced users. Compared with conventional astrophotography setups, the Seestar series offers significant advantages in affordability, portability, and ease of use. As a highly integrated and user-friendly smart telescope, it makes exploring and capturing the beauty of the night sky easier and more accessible than ever.

1.2 Key Features

1. **Lightweight and Portable:**The Seestar S50 Pro integrates the telescope, electronic focuser, astronomy camera, wide-angle camera, ASIAIR smart controller, alt-azimuth mount, dew heater, and filter switching mechanism into a single compact device. Its highly integrated all-in-one design makes it lightweight, portable, and ready for observation wherever you go.

2. **Intelligent Automation:** Powered by ZWO's proprietary intelligent target acquisition algorithm, the Seestar S50 Pro automatically locates, tracks, plate solves, and focuses on celestial objects with a single tap. The entire imaging process can be completed effortlessly through the Seestar app.

3. **Multiple Observation Modes:**The Seestar S50 Pro offers four observation modes: Stargazing Mode, Milky Way Mode, Solar System

Mode, and Scenery Mode. Capture stunning deep-sky objects such as nebulae, star clusters, and galaxies, or observe and image solar system targets including the Sun and the Moon. Milky Way Mode is designed for wide-field astrophotography, making it ideal for capturing the Milky Way, star trails, and constellations. Scenery Mode lets you observe and capture birds, wildlife, and natural landscapes with ease.

4. **Intelligent Dual-Camera System:**The Seestar S50 Pro is equipped with both an astronomy camera and a wide-angle camera, each featuring its own dedicated image sensor. Supporting both photo and video capture, the dual-camera system adapts to a wider range of shooting scenarios and offers greater creative flexibility.

5. **4K Ultra HD Imaging:**Both the telephoto and wide-angle cameras support 4K Ultra HD imaging (2160 × 3840). The wide-angle camera features a 1/2-inch, 8.3 MP image sensor, while the telephoto camera is equipped with a larger 1/1.2-inch, 8.3 MP image sensor.

6. **Milky Way & Star Trail Shooting:** Equipped with a wide-angle lens featuring 6mm focal length and F1.75 aperture, it supports Milky Way and star trail photography, as well as the wide-angle stargazing image stacking function.

7. **High-Definition Imaging** : Equipped with a professional 4-element apochromatic lens, featuring an ED glass. This setup ensures high color fidelity, sharp focus, and crisp imaging by effectively converging refracted light.

8. **One-Tap NFC Connection:** Simply tap your NFC-enabled smartphone to the Seestar S50 Pro for fast and effortless pairing. NFC eliminates the need for manual device connection, allowing you to connect to your own Seestar S50 Pro quickly and securely.

9. **Equatorial (EQ) Mode:** Equatorial (EQ) Mode compensates for the

Earth's rotation during tracking, enabling longer exposure times and more stable tracking. By reducing field rotation, it helps produce sharper images with improved overall image quality.

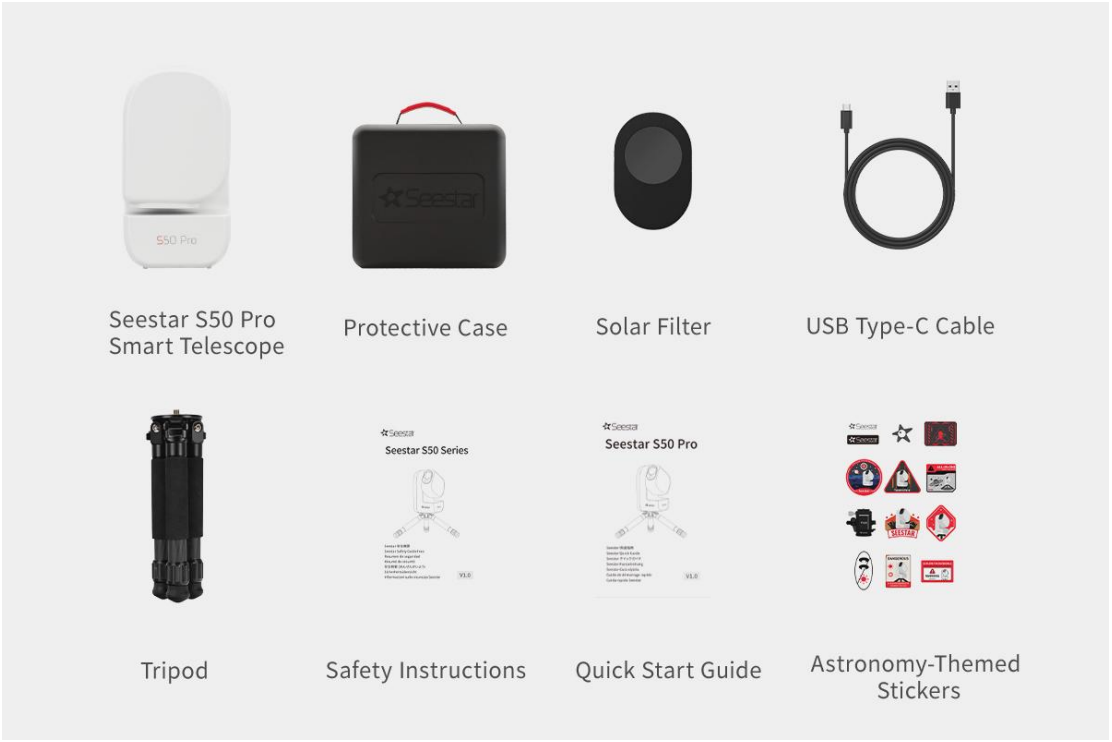
10. **Dual-Band Anti-Light Pollution Filter** : Since many users live in areas with significant light pollution, the Seestar S50 Pro includes dual-band filters (OIII 30nm/Ha 20nm). Users can manually enable the anti-light pollution filter from the App to improve image quality in challenging environments.

11. **Proprietary System** : Built on ZWO's independently developed motherboard, ensuring stable system performance. This proprietary system, along with ZWO's patented technologies, guarantees precision in imaging and system stability. Continuous App updates enhance functionality and user experience.

12. **Comprehensive Database** : Includes a robust star database, an encyclopedia of common celestial objects, and intelligent star map guidance for easy navigation.

13. **Global Astronomy Community** : Users can share their work, interact with online friends, and access real-time weather updates in a global astronomy community.

1.3 What's in the Box?



1.4 Specification

Product Model	Seestar S50 Pro
Sensor	Tele: 1/1.2" CMOS Wide: 1/2" CMOS
Resolution*	Tele: 2160 x 3840, vertical Wide: 2160 x 3840, vertical
Field of View	Tele: 2.8° Wide: 63°
Aperture	Tele: 50mm Wide: 3.4mm
Focal Ratio	Tele: F/5.2 Wide: F/1.75
Focal Length	Tele: 260mm Wide: 6mm
Optical System	4 Apochromatic
Builtin Filter	UV/IR-Cut Filter Duo-Band Filter(OIII 30nm/Hα20nm) Dark Filter
External Filter	Magnetic adsorption solar filter
Working Distance	Tele: 15m~ ∞ Wide: 0.1m~ ∞
Storage Space*	128GB

Transimission Method	Wi-Fi/ USB type-C/Bluetooth
Image Format	JPEG/FITS
Video Format	MP4/AVI
Wi-Fi	5G/2.4G
Wi-Fi Effective Transmission Distance*	≤ 10m
Bluetooth Effective Transmission Distance*	≤ 5m
Working Temperature	-10℃~40℃
Charging Ambient Temperature	0℃~40°C
Storage Temperature	-10℃~60℃
Working Humidity	20%~80%
Storage Humidity	20%~50%
Mount	Alt-Azimuth (EQ Mode supported)
Slew Rate	1X- 1440X
Zero Position	Mechanical
Battery Life*	10000mAh, Lasts up to 9 hours after a full charge (tested in ZWO laboratory)
Interface on Base	3/8-16
Weight	2.8KG (without tripod)

Power Input	Type-C, Supports DC 5V~3A； 12V~3A
Wi-Fi Reset Button	Support
Dimension	260mm x 140mm x 145mm

*[1] **Resolution:**Both the telephoto and wide-angle cameras capture images at a resolution of 2160 × 3840 (4K) at 1× magnification. Image resolution is reduced when using 2× or 4× magnification.

*[2] **Storage Capacity:**Due to system files and reserved storage space, the actual available storage is approximately 100 GB. Available capacity may change after future system updates. Please refer to the actual available storage on your device.

*[3] **Wi-Fi and Bluetooth Transmission Distance:**The transmission distances listed above were measured in an open environment free of obstructions between devices. The values are for reference only. Actual performance may vary depending on the operating environment.

*[4] **Battery Capacity and Battery Life:** Note: Battery life of approximately 9 hours was measured by the ZWO Laboratory at 25°C under laboratory conditions, with Image Enhancement and Object Tracking enabled and the dew heater turned off. The test results are for reference only. Actual battery life may vary depending on usage conditions.

1.5 Product Diagram

① Charger Port（USB Type-C）

② Power Switch & Power indicator

③ Battery indicator

④ Wi-Fi reset button

⑤ Tripod interface:（3/8"-16 thread）

⑥ Battery compartment

⑦ Telephoto lens

⑧ Wide-angle lens

1.6 Buttons and Indicators

1. Power Button

Show battery status	Short press the button while power off
Power on	Long press 2s (Short press 1s and then 2s for first-time use)
Power off	Long press 2s
Forced shutdown	Long press 6s

2. Power indicator and battery indicator

Scene	**Power Indicator**	**Battery Indicator**
Check the battery level when the device is powered off	Light off	Light off after showing the battery status
Power on	Red running light rotates clockwise for 2 cycles, followed by 1 clockwise flowing cycle until fully lit.	Show the battery status
Boot failure#	Red light blinks	Four lights blink rapidly
Powered on (Not activated)	Red light breathes rapidly	Show the battery status
Powered on (Not connected / Idle)	Red light breathes slowly until Wi-Fi is connected	Show the battery status

Powered on (Connected)	Yellow light stays on (Alt-az Mode) or green light stays on (EQ Mode).	Battery status 0-15% battery, red, 1 light blinks 16-25% battery, red, 1 light on 26-50% battery, red, 2 lights on 51-75% battery, red, 3 lights on 76-100% battery, red, 4 lights on
Power off	Red flowing light rotates counterclockwise for 1 cycle, then turns off.	Light off
Reset Wi-Fi when the device is powered on	While resetting, the yellow power light blinks; After resetting, the yellow power light is on; If fairs, the red light blinks	Show the battery status
Switch Wi-Fi when the device is powered on	Red light blinks	Show the battery status
Firmware update when the device is powered on	When the firmware upgrade begins, the yellow light blinks rapidly; once completed, the yellow light blinking stops, and the light returns to its original state.	Show the battery status
Charging, no matter whether	Powered off: Red flowing light cycles	0-25% battery, red, the 1st light blinks 26-50% battery, red, the 2nd light blinks

the device is powered on or off	while charging; turns off when fully charged. Powered on: Current operating status remains displayed; no charging indicator.	51-75% battery, red, the1st and 2nd light on, the 3rd light blinks 76-100% battery, red, 4 lights on
Device working	Enhancing (Live stacking): Yellow light breathes slowly in Alt-az Mode; green light breathes slowly in EQ Mode. Others: Yellow light stays on in Alt-az Mode; green light stays on in EQ Mode.	Show the battery status
Imaging completed	Normal: Yellow light stays on in Alt-az Mode; green light stays on in EQ Mode. Abnormal: Yellow light blinks	Show the battery status

Reasons for startup failure and solutions

○ Insufficient device battery: Please fully charge the S50 Pro before attempting to power it on.

○ Other malfunctions: Please contact after-sales technical support.

3. Wi-Fi reset button:

If Wi-Fi is not detected after startup, you can reset the Wi-Fi using this method. Press and hold the Reset button for about 3 seconds to reset the Wi-Fi.

1.7 Battery Specification and Certificate

Charging Voltage	4.2V
Rated Voltage	3.6V
Rated Capacity	10000mAh
Rated Power	36Wh

1.8 Tripod

The Seestar S50 Pro comes with an adjustable carbon fiber tripod as standard. The tripod features two leg angle positions and two-stage telescopic legs for flexible height adjustment. When fully extended with the widest leg angle, it measures **227 mm** in height and **737 mm** in diameter. When folded, it measures **275 mm** in length with a maximum diameter of **85 mm**. A **3/8-inch mounting screw** on the top of the tripod attaches directly to the threaded mounting socket on the bottom of the Seestar S50 Pro. The Seestar S50 Pro is also compatible with other photographic

tripods equipped with a **3/8-inch mounting screw**.

Note: When using **EQ Mode**, fully extend the tripod legs and set them to the widest leg angle for optimal stability.

2. For the First-Time Use Seestar S50 Pro

2.1 Set up Seestar S50 Pro

Remove the Seestar S50 Pro and accessories from the packaging. Set up the tripod on a flat surface and align the hole at the bottom of the S50 Pro with the 3/8" screw on top of the tripod. Rotate clockwise to securely tighten the Seestar S50 Pro to the tripod.

2.2 Download Seestar App

The Seestar App is a mobile Application dedicated to the Seestar series of smart telescopes. Through the App, you can capture celestial objects, stack images, perform post-processing, and quickly embark on your astrophotography journey while joining the global astronomy community to share your work.

Scan the QR code below with your phone or visit the App Store to download the Seestar App.

The minimum system and hardware requirements to run the Seestar App:

	Version	RAM	GPU
IOS/IPadOS	13.0 and above		
Android	10.0 and above	6GB	Recommend Adreno 660 840MHz and above

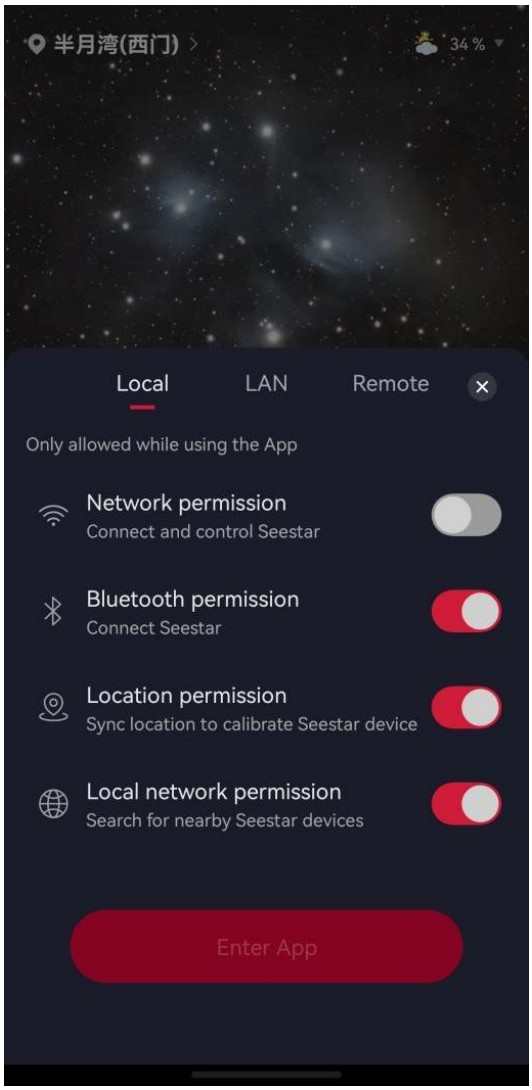
2.3 Start Connection

For first-time use, briefly press the power button on the Seestar S50 Pro body for 1 second, then press and hold for an additional 2 seconds. You'll hear a "beep-beep" sound and see the power button light up, indicating that the device has successfully powered on. For subsequent uses, simply press and hold the power button for 2 seconds to turn the device on or off.

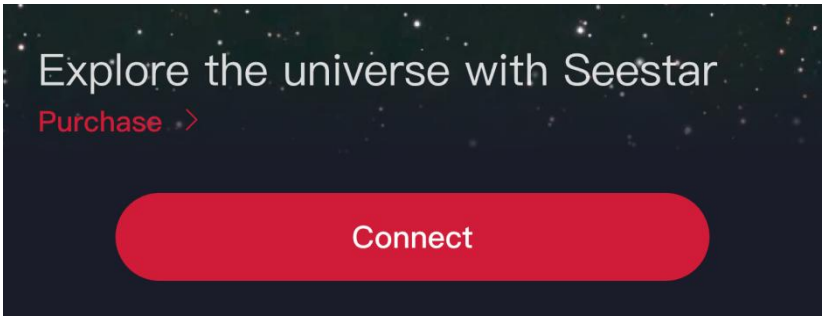
*If the battery is too low, the device won't power on, so charge it when necessary.

After a few seconds, you will hear the device announce: "Powering on, ready for connection." Bring your smartphone or tablet close to the Seestar S50 Pro and launch the Seestar App (make sure to grant the necessary

permissions when using the App for the first time).



Hit the "Connect" button.

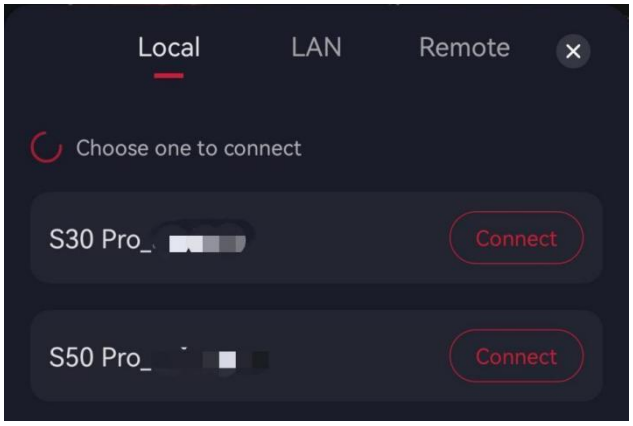


* **Note:** Ensure that Bluetooth, device connection, and network permissions are

enabled for the Seestar App to facilitate a smooth connection.

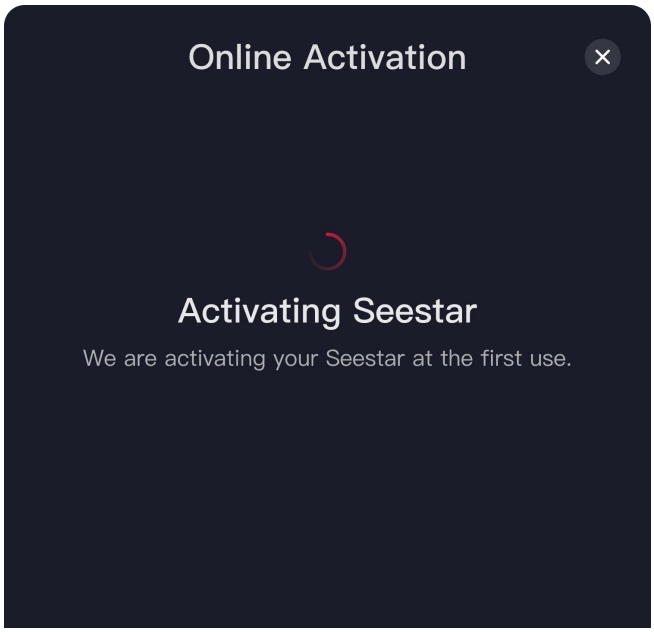
The App will then scan for nearby Seestar S50 Pro devices. Select the S50 Pro you wish to connect to, and tap "Connect"

For the first connection, follow the prompts to locate and press the reset button at the bottom of the Seestar S50 Pro to confirm the connection.

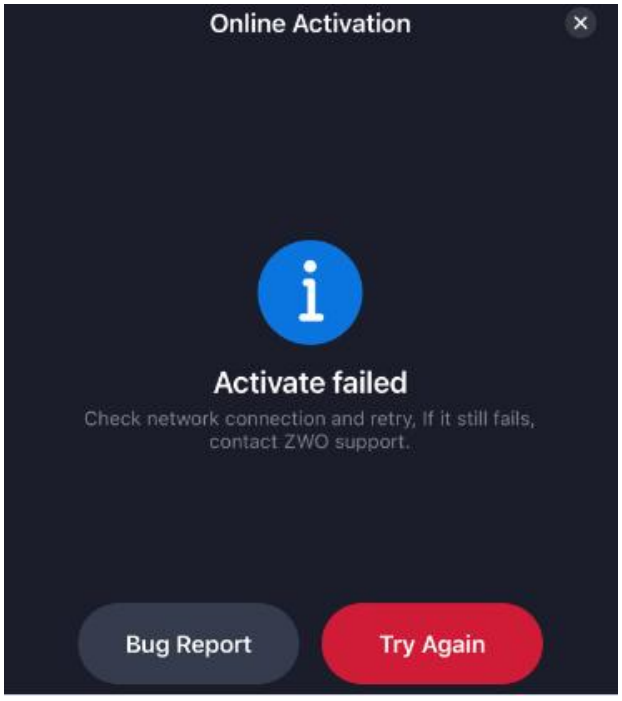


2.4 Network Activation

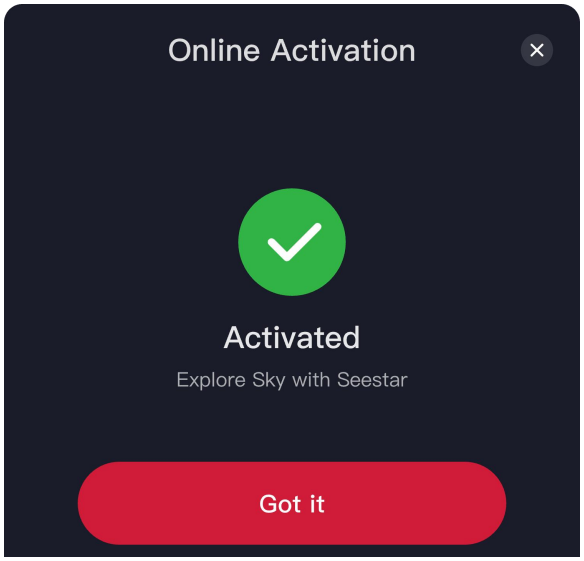
Before using the Seestar S50 Pro for the first time, the device must be activated online. Activation requires an Internet connection and a signed-in ZWO account. If you do not have a ZWO account, register one and sign in. Ensure that your smartphone or tablet has Internet access to complete the activation process.



If activation fails midway, verify that your mobile device is connected to a working network or home Wi-Fi. You can put the Seestar App in the background, manually connect your mobile device to a valid network, and then return to the Seestar App to tap the "Try Again" button and try the activation again.



Under normal conditions, the S50 Pro should activate quickly as long as the mobile device is connected to the Internet.



Important Notes:

1）Seestar products are available in China and international versions. The China version can only be activated and used in China and cannot be activated outside China. The China version is not covered by warranty service outside China.

2）Do not minimize or close the Seestar App during activation.

3）If activation fails, check your network connection and try again. If the issue persists, please contact customer support.

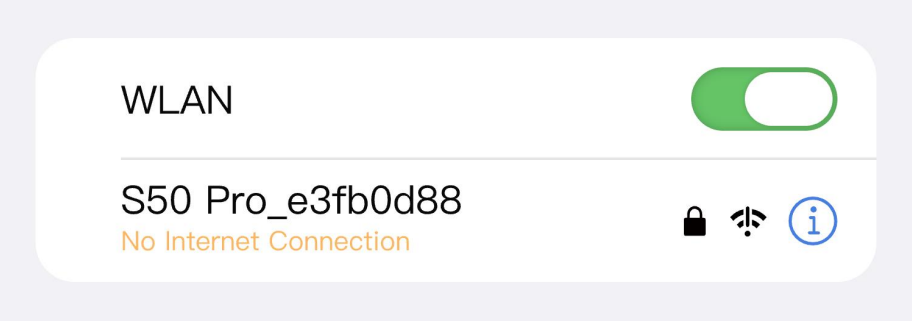
2.5 Initiating the Connection

After successful activation, your mobile device will automatically connect to the Seestar S50 Pro's built-in Wi-Fi hotspot. At this point, the mobile

network or home Wi-Fi is no longer required. The Wi-Fi hotspot connection will work even in remote areas without cellular service.

If the connection fails, follow the App prompts to retry or manually connect to the Seestar S50 Pro's hotspot.

Tip: Due to the limits of Android operating systems, Android devices cannot automatically connect to the Seestar S50 Pro's Wi-Fi hotspot and require manual setup. To manually connect, go to your phone or tablet's system settings, select Wi-Fi, and choose the hotspot with the name of your S50 Pro's serial number (e.g., S50 Pro_xxxxxx). The default password is **12345678** .



2.6 NFC Connection

After the initial activation, you can quickly connect to the Seestar S50 Pro using NFC.

1. Make sure your smartphone supports NFC and that NFC is enabled.
2. Locate the NFC sensing area on your smartphone, which is typically on the back, near the center or the top.
3. Power on the Seestar S50 Pro. After unlocking your smartphone, tap the phone's NFC sensing area against the NFC sensing area on the Seestar S50 Pro.

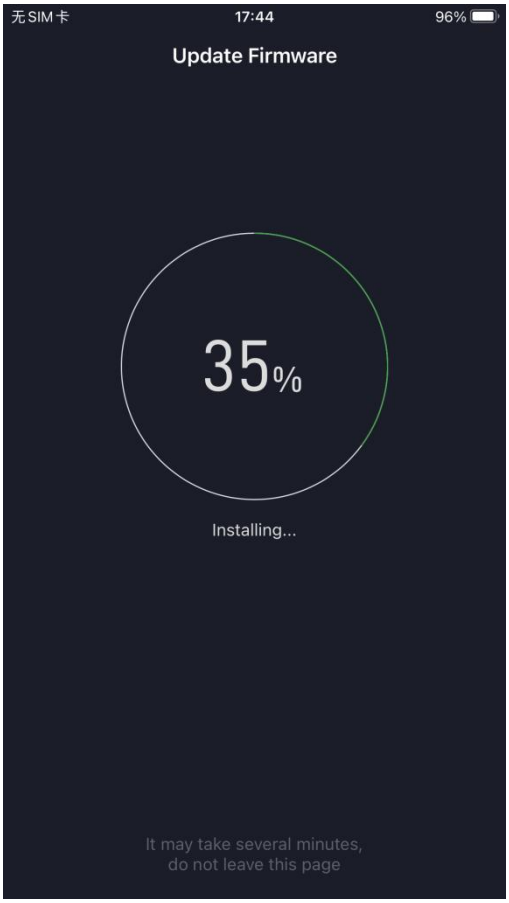
4. Once the NFC connection is detected, the Seestar app will launch automatically and connect to the device. Tap Confirm Connection to complete the connection.

Notes:

- NFC connection is available only on smartphones that support **NFC**.
- On some smartphones, the NFC sensing area is relatively small. If the sensing area is not properly aligned, the NFC connection may fail. Make sure the phone's NFC sensing area is correctly positioned.
- If you change the device's **Wi-Fi name (SSID)** or **password**, update the device's NFC information on your smartphone. Otherwise, NFC connection will not be available.

2.7 Firmware Update

Once your mobile device is successfully connected to the Seestar S50 Pro, if a firmware update is prompted, please follow the instructions to allow the update. Wait for the update process to complete before using the device. After the firmware update is finished, the S50 Pro will automatically reboot. If there is no firmware update prompt, you can skip this step.



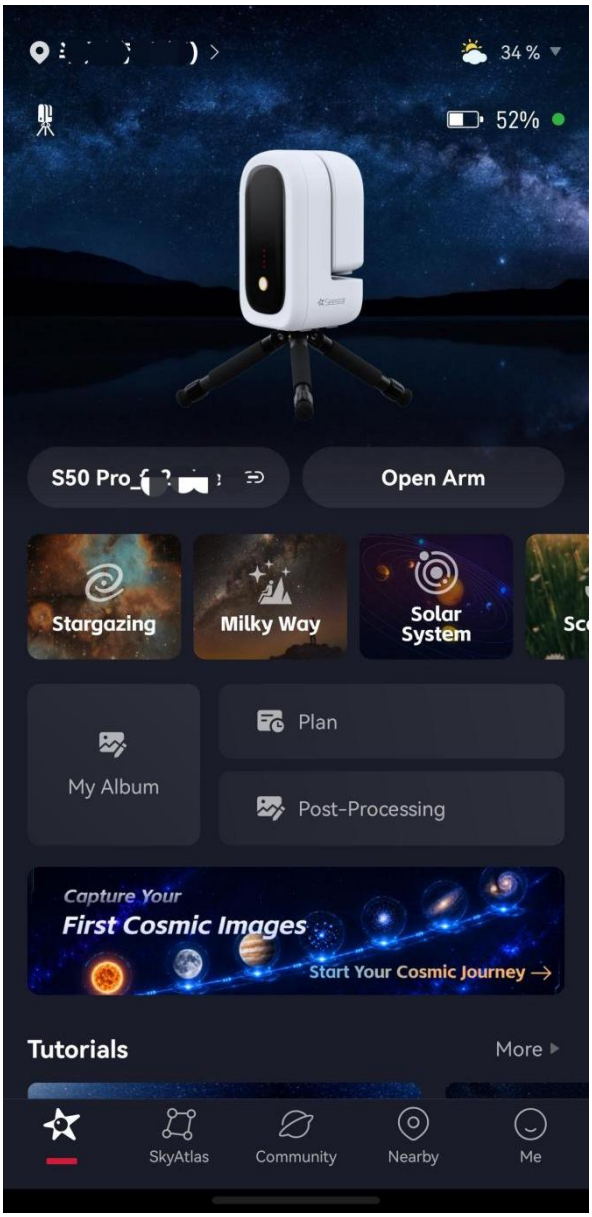
2.8 Using the S50 Pro for Photography

Below are instructions for both deep space and solar photography.

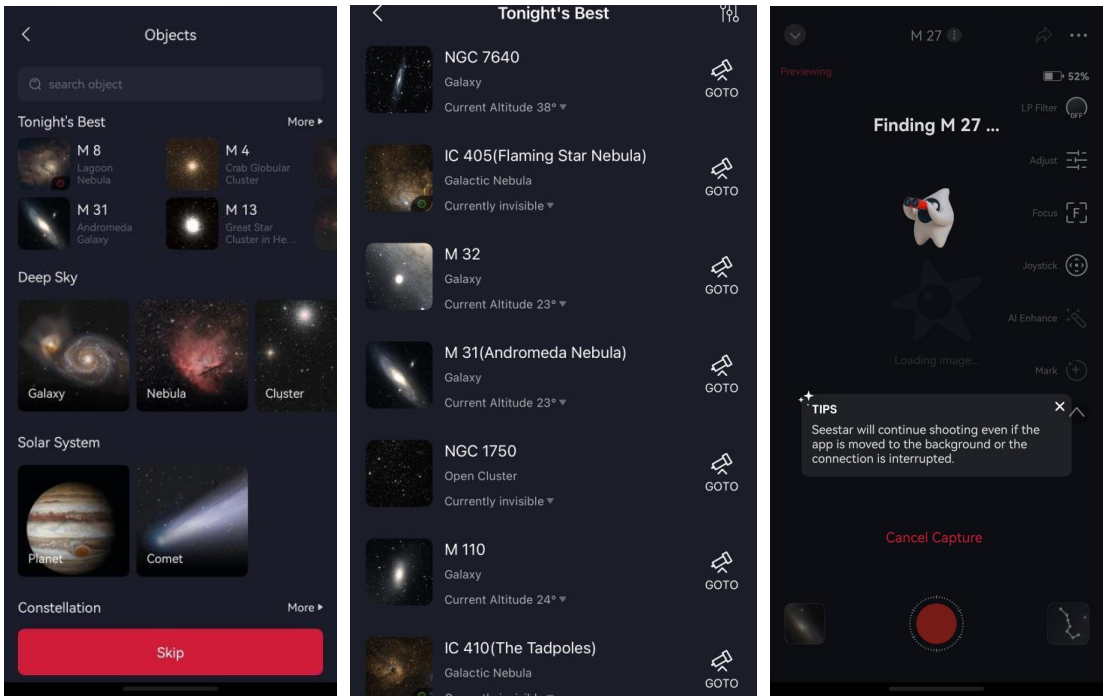
2.8.1 Deep Space Object Photography (Best Conducted at Night)

2.8.1.1 Stargazing Mode

After connecting the Seestar App to your Seestar S50 Pro, select "Stargazing" on the homepage.Stargazing Mode is designed for imaging deep-sky objects, including nebulae, galaxies, star clusters, and comets.



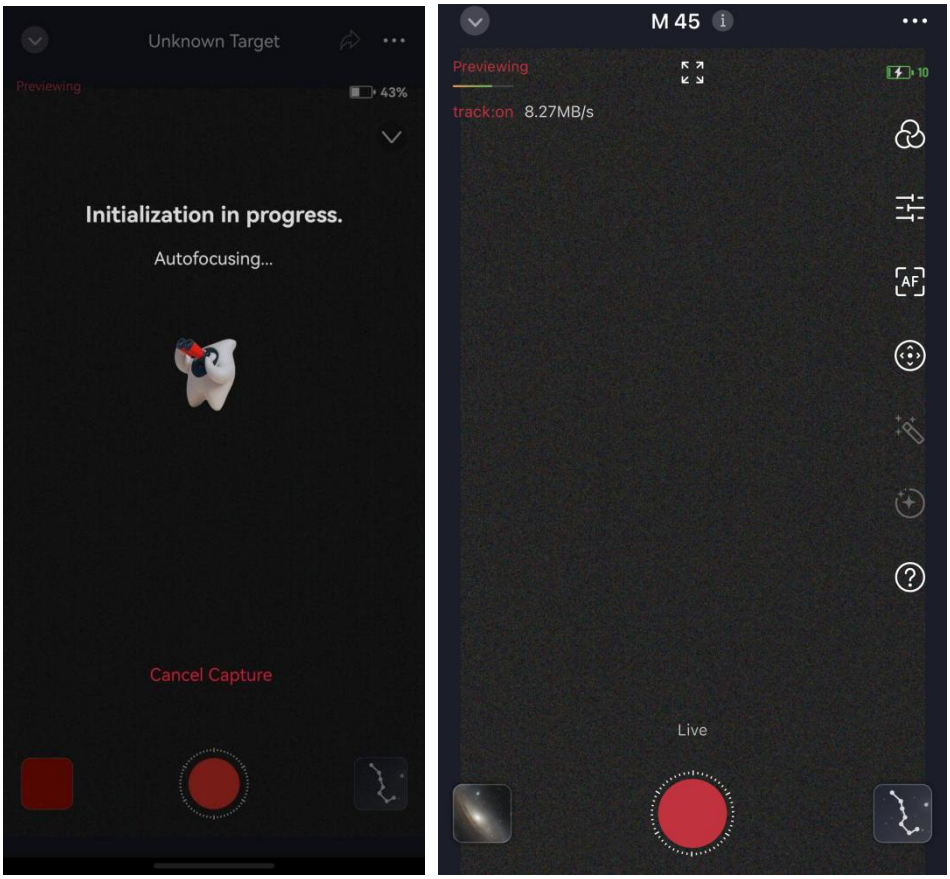
On the next page, the system will recommend "Tonight's Best" objects. It will also show the full list of deep space and solar system objects. You may choose one from these categories for imaging or observation.



Scroll up and down the list to find a target with a relatively high "Current Altitude." Click the "GOTO" button next to your selected target, and the telescope will slew toward it.

As the telescope moves, you'll notice the angle from the object decreasing, indicating that the device getting closer to the target.

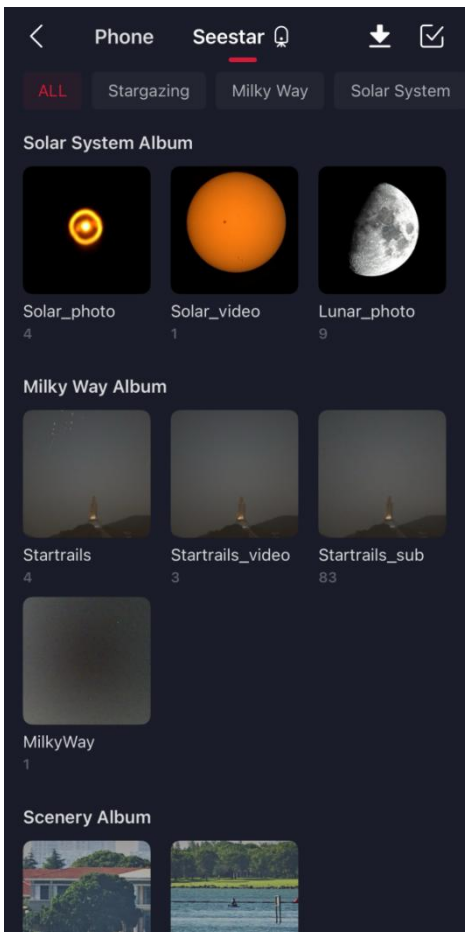
After a short wait, the telescope lens will lock onto the target, and then S50 Pro will begin its automatic initialization process, which prepares for subsequent photography. (This initialization occurs only once after powering on the S50 Pro; subsequent sessions won't trigger this step.)



Once initialization is complete, the S50 Pro will automatically start imaging. By default, the Seestar S50 Pro captures 10-second exposure frames and stacks them. You can watch the image gradually getting sharpened in the App. (The waiting time for clear images depends on weather conditions, light pollution, etc.) While it's imaging, you can exit the App and do other things. The Seestar S50 Pro will continue the current imaging task, even if the mobile device disconnects. You can reconnect the App later to view the latest progress.

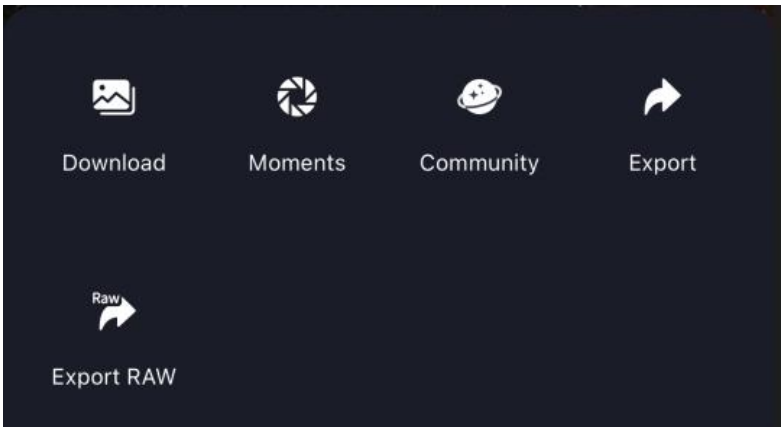
Once you're satisfied with the quality of the stacked image, click the "Stop" button to end the session. Congratulations, you've successfully captured a deep space object with your S50 Pro!

To export the image to your phone, open the album in the bottom left corner of the imaging page. Switch to the "Seestar" tab at the top to view the images stored on the Seestar S50 Pro device. Find the folder with the target you just captured, and open it.



Click on the image you just took to view it.

Hit the "Share" button and then select "Download" from the bottom menu. This will save the image to your phone's gallery for quick access.



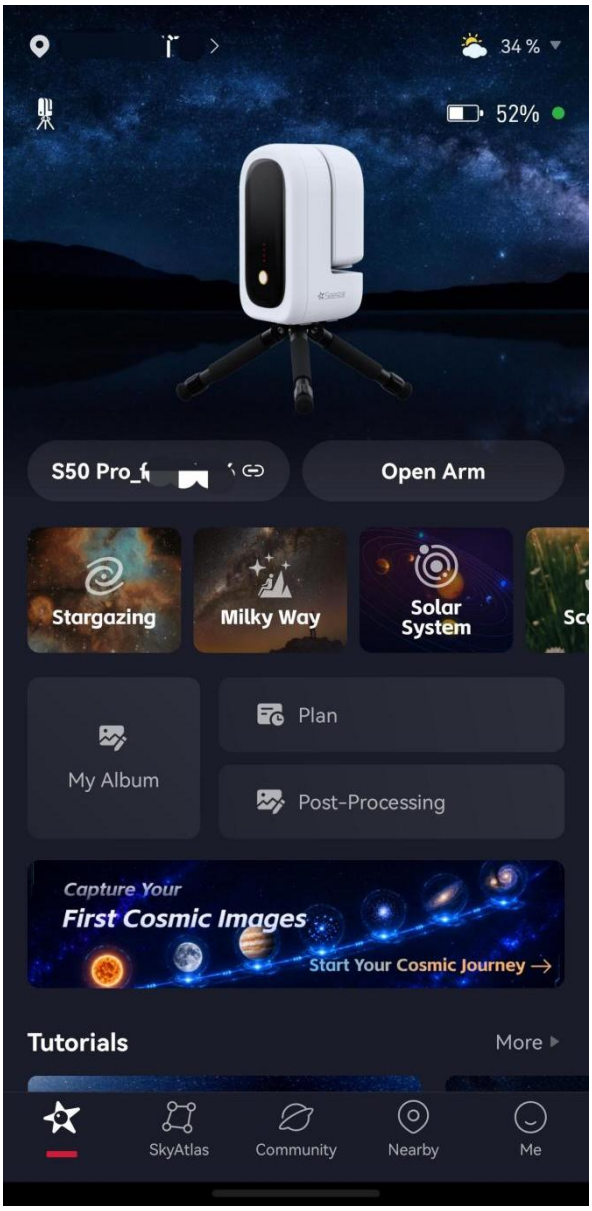
View the target photos you've captured in your phone's gallery, you may share them on social media or in the App's community to share your special stargazing experience with fellow astronomy enthusiasts.

***Tip:** You can also quickly share your photos directly to the App's community from the Seestar gallery.

Once done, you can continue to observe other celestial targets or power off the device and store it away.

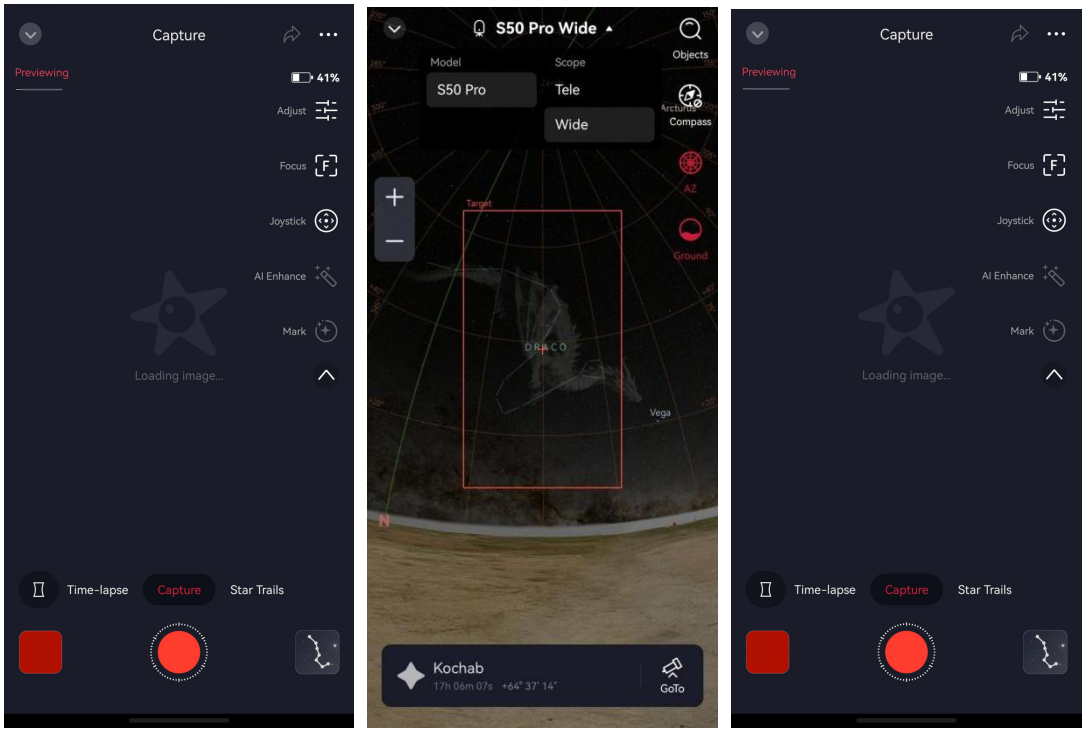
2.8.1.2 Milky Way mode

Connect the Seestar app to the Seestar S50 Pro, then select Milky Way from the Home screen. Milky Way Mode is designed for capturing the Milky Way, star trails, and constellation lines.



Tap the SkyAtlas icon in the lower-right corner to open SkyAtlas and select a target. To capture the Milky Way, for example, move the framing box over the Milky Way and adjust the composition as desired, then tap GoTo.

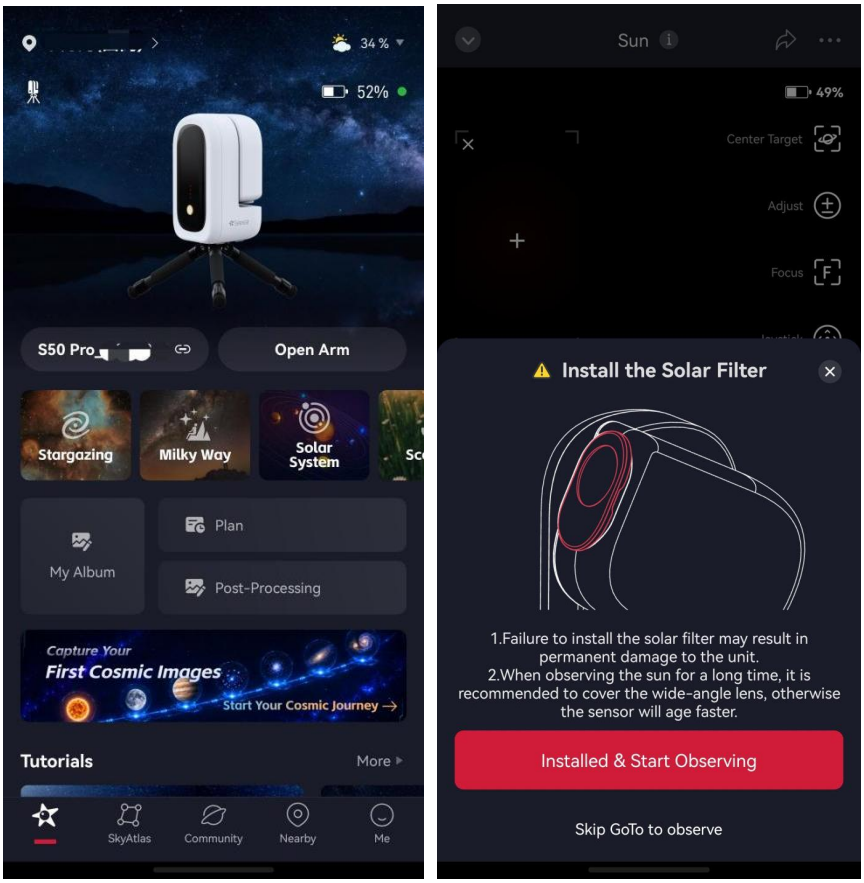
After GoTo is complete, return to the imaging screen, set the desired exposure time, make sure Photo mode is selected, and tap the Shutter button to start capturing images.



2.8.2 Solar Imaging (Best Conducted at Daylight)

Note: Before starting to capture the Sun, make sure to properly install the included solar filter. Do not proceed with the following steps without it!

Once Seestar App is connected to Seestar S50 Pro, go to the home page and select "Solar System".

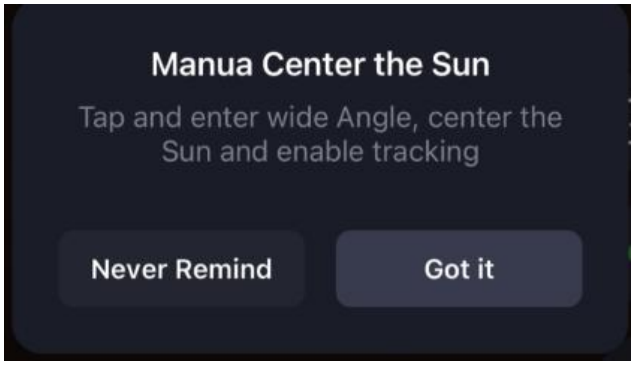


In the Solar System targets, select Sun, then click GOTO (ensure the Sun is visible in the sky). The lens will lift to a certain angle and stop. At this point, please follow the instructions in the App to install the solar filter onto the telescope lens. After installation, click "Installed & Shooting," and S50 Pro will continue its GOTO to the Sun.

To ensure maximum safety for both you and the device, auto GOTO will stop

once the lens roughly points at the Sun. Follow the App's instructions and manually adjust the lens to point directly at the Sun.

Important: Before proceeding, please confirm the solar filter is securely installed on the telescope lens.

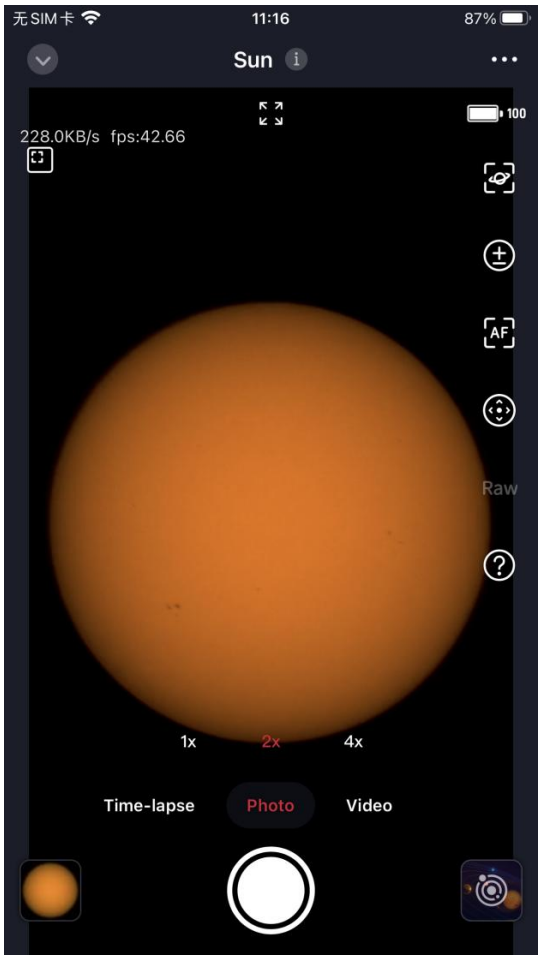


You may also use the manual method to find the Sun:

- If you cannot see the Sun's light in the telephoto view: Use the "GO" target feature in wide-angle view to bring the lens closer to the Sun, then use the virtual joystick to fine-tune the alignment. Here's how: Switch to the wide-angle view, hit once on the brightest point of the Sun, and the "GO" icon will Appear. Hit again, and Seestar S50 Pro will slew towards the targeted point. Repeat this process until the Sun is visible in the telephoto view.

- If the solar light becomes visible in the telephoto view after Auto GOTO or multiple "GO" attempts, switch to the telephoto view. Activate the virtual

joystick, set it to "Slow" speed, and manually adjust the lens to align with the Sun. Once aligned, you will see the Sun clearly in the telephoto view.



Choose the suitable magnification levels (1x/2x/4x) to observe the Sun, choose the Appropriate field of view, and tap the circular button

below to capture a photo.

After successfully photographing the Sun, if you wish to end the solar observation, use the virtual joystick to move the Sun out of the telephoto view. Only then should you remove the solar filter from the lens. Congratulations, you've successfully captured the Sun using the S50 Pro!

Caution: Never point the lens directly at the Sun without the solar filter installed.

Note: To maintain its compact and portable design, the Seestar S50 Pro uses a relatively short focal length. It is well suited for imaging deep-sky objects, the Moon, and the Sun. However, it may not capture fine planetary details, such as Saturn's rings.

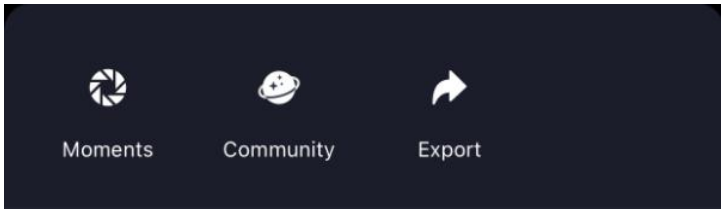
Next, let's view the photos you've just captured.

Open the album at the bottom left of the imaging interface, and switch the album tab at the top to "Saved" to view images taken with the S50 Pro. (For videos, navigate to the "Seestar" tab.) Locate the folder named with the date of the current session and open it.

Tap on the photo you've just taken to view it. Then, tap the share

icon on the bottom.

In the pop-up menu, choose to share the photo on social media or export it to other Apps, sharing this special stargazing experience with astronomy enthusiasts worldwide.



Tip: You can also directly share photos to the in-built community.

Once everything is complete, you can either continue to observe other objects or power down the device and store it properly.

2.8.3 EQ Mode Imaging

Note: This procedure must be performed outdoors in an open area with an unobstructed view of the sky and clearly visible stars.

EQ Mode compensates for the Earth's rotation during tracking, enabling longer exposure times, more stable tracking, and reduced field rotation for improved image quality.

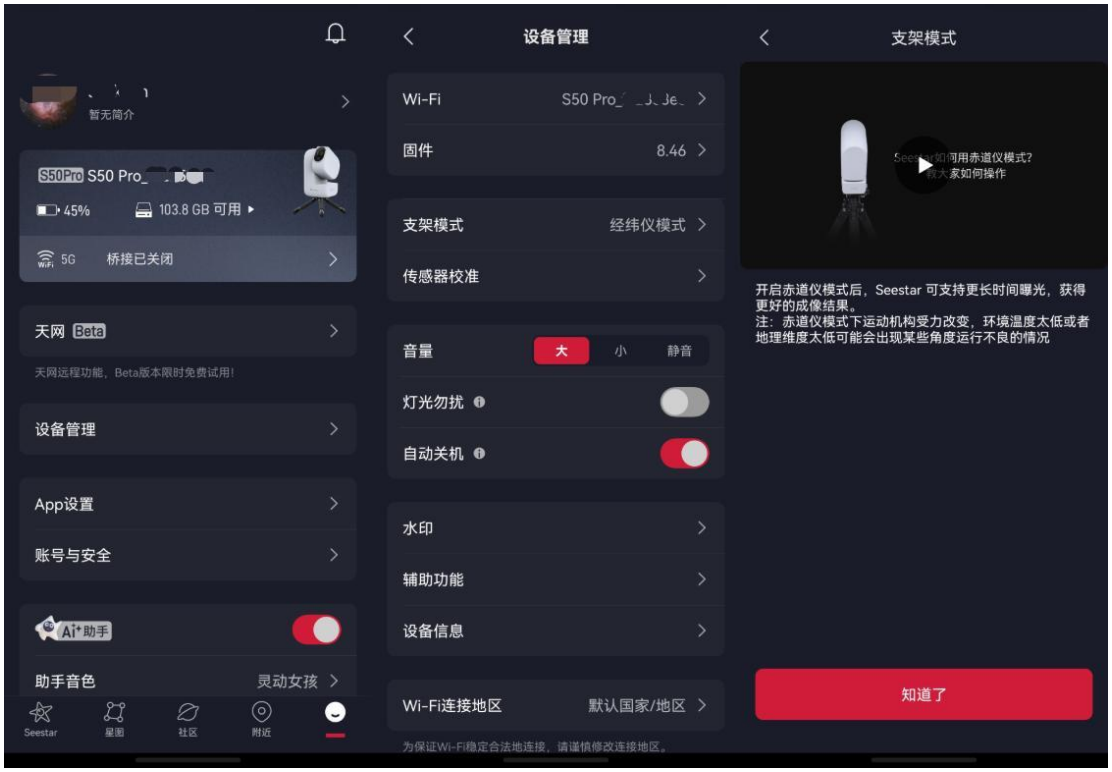
Before you begin, prepare the tripod, Seestar S50 Pro, and Seestar EQ Wedge.

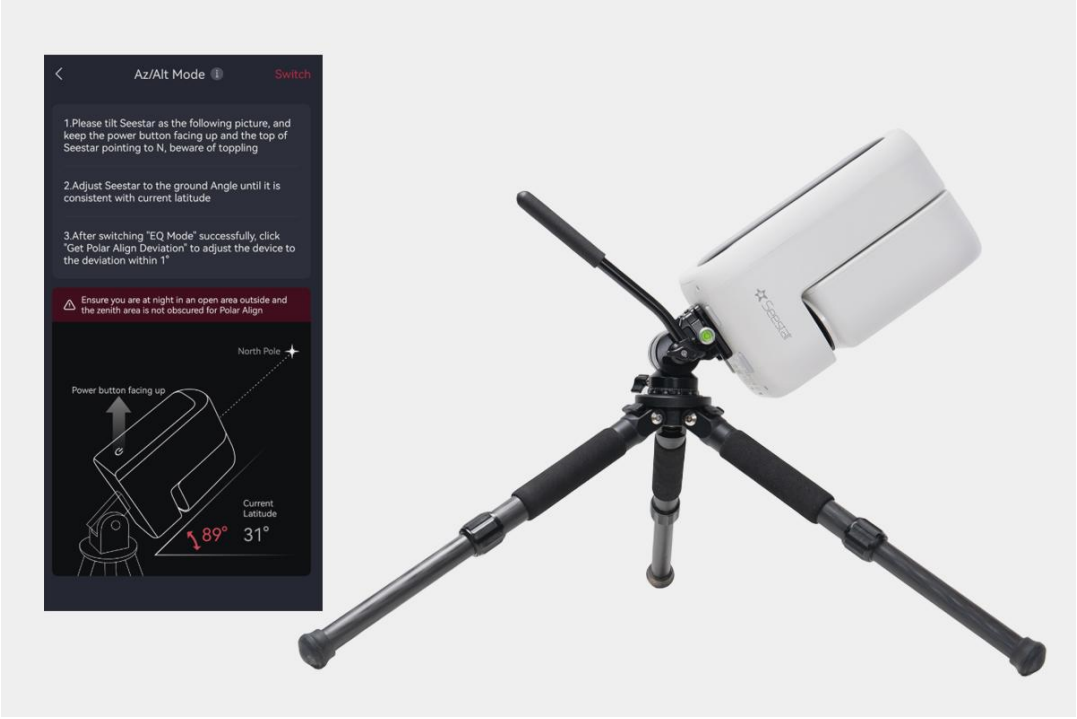
1. Fully extend the tripod legs to the widest leg angle and maximum leg length, then level the tripod. Position the tripod so that one leg points toward true north.

⚠ Ensure that one of the tripod legs points toward true north.

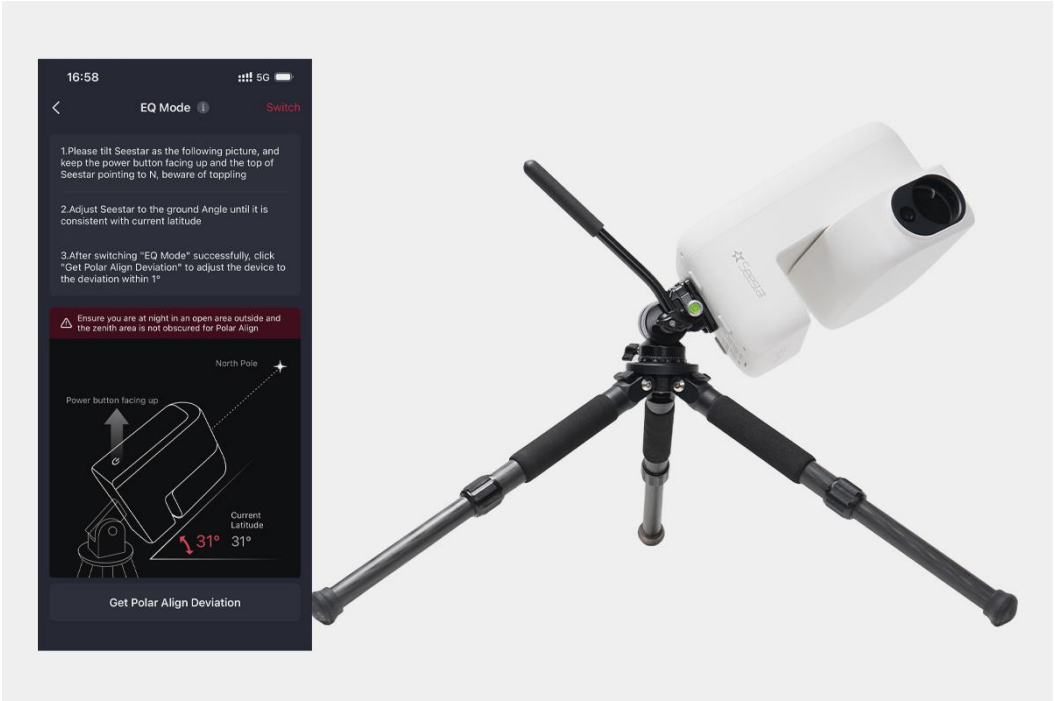
2. Attach the quick-release plate to the bottom of the Seestar S50 Pro and tighten it securely. Mount the Seestar EQ Wedge onto the tripod, ensuring that the vertical center of the wedge is aligned directly above one tripod leg to prevent the equipment from tipping over. Then mount the Seestar S50 Pro onto the wedge, making sure the optical tube is positioned above the north-facing tripod leg.

3. Power on the Seestar S50 Pro and connect it to your mobile device. In the Seestar app, tap Me at the bottom of the screen, then go to Device Management > Mount Mode. After watching the tutorial video, follow the on-screen instructions to adjust the angle of the Seestar EQ Wedge. This step must be performed outdoors with an unobstructed view of the sky.

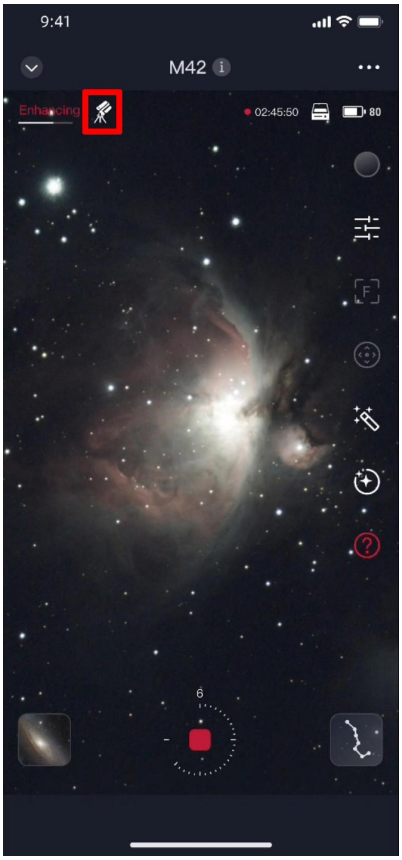




4. After the adjustment is complete, tap Switch in the upper-right corner to switch the Seestar S50 Pro to EQ Mode. Then tap Calculate Polar Alignment Error. When the calculation is complete, the app displays the azimuth and altitude alignment errors. Fine-tune the EQ Wedge until both errors are within 1°.



5. Once the adjustment is complete, secure the equipment, enter Stargazing Mode, select a target, and begin observing. The imaging screen will indicate that the Seestar S50 Pro is operating in EQ Mode.



2.9 Battery Life

The Seestar S50 Pro has an internal battery that lasts Approximately 9 hours. If you need to extend the battery life, please prepare an additional power source for the device. The Seestar S50 Pro supports working while charging. At home or when you have access to a power outlet, you can connect the Type-C cable to a power adapter or computer that meets the power input specifications. When using the device outdoors, you can carry a portable charger to charge the device as needed.

Note: The battery life is based on test results from ZWO's internal laboratory. Actual usage time may vary depending on the environment and operating conditions of the device.

2.10 Power Off and Storage

If you have completed your shooting tasks, please follow the instructions below to power off the device.

- **Two methods for normal shutdown:**

a. **Method 1:** In the App, go to the "My" page, and at the bottom, use the swipe-to-shut-down function. The Seestar S50 Pro lens will return to the zero position and then shut down smoothly.

b. **Method 2:** On the Seestar S50 Pro device, press and hold the power button for 3 seconds. The Seestar S50 Pro lens will return to the zero position and then shut down smoothly.

- **Forced shutdown method:**

If the device cannot be powered off through the normal shutdown methods, use this forced shutdown method.

On the Seestar S50 Pro device, press and hold the power button for 6 seconds. The Seestar S50 Pro lens will not return to the zero position and

will shut down directly.

- **Automatic shutdown mechanism:**

When the battery level drops below 5%, the device will automatically return to the zero position and shut down.

After powering off, please store the device in a clean and dry place.

3. Accessory Installation and Removal

3.1 Installing the Solar Filter

Warning: Do not allow the telescope lens to directly observe the sun!

- While observing the sun, please use the standard solar filter coming with Seestar. Before entering the Solar System mode in the Seestar App for solar observation, follow the on-screen instructions to attach the magnetic solar filter to the primary mirror position. Then, operate the App to point the telescope at the sun for observation.

- After completing the observation, first adjust the angle of the Seestar S50 Pro lens to ensure the sun is no longer within the field of view of the telescope lens, then remove the solar filter and store it properly.

3.2 Battery Removal

If you need to replace the battery, please follow these steps:

1. Locate the battery compartment on the device body.
2. Use an Appropriate tool (such as a flathead screwdriver) to gently pry open the battery cover.
3. Carefully disconnect the battery terminal.
4. Finally, remove the battery. Please ensure that you handle everything gently throughout the process to avoid damaging the equipment.

Precautions:

1. Before removing the battery, make sure the device is turned off and disconnected from any power source. Also, handle with care to prevent damage to the device or the battery.
2. After removing the old battery, store it safely to avoid short circuits.
3. Do not remove the battery unless you intend to replace it.

4. Observation/Photography Tips

- Targets like the Veil Nebula can be very difficult to observe and require extremely dark skies. For beginners, it is recommended to start with brighter deep-sky objects such as M31, M42, and NGC104.

- This product can be used on balconies, in gardens, cities, or rural areas. It is suggested to have at least 45° of unobstructed sky to avoid any surrounding obstacles blocking the view of your observation target.

- Various factors can affect the quality of observations, such as light pollution levels, atmospheric disturbances, and light pollution. To minimize the impact of light pollution, stay away from streetlights, building security lights, or other direct light sources.

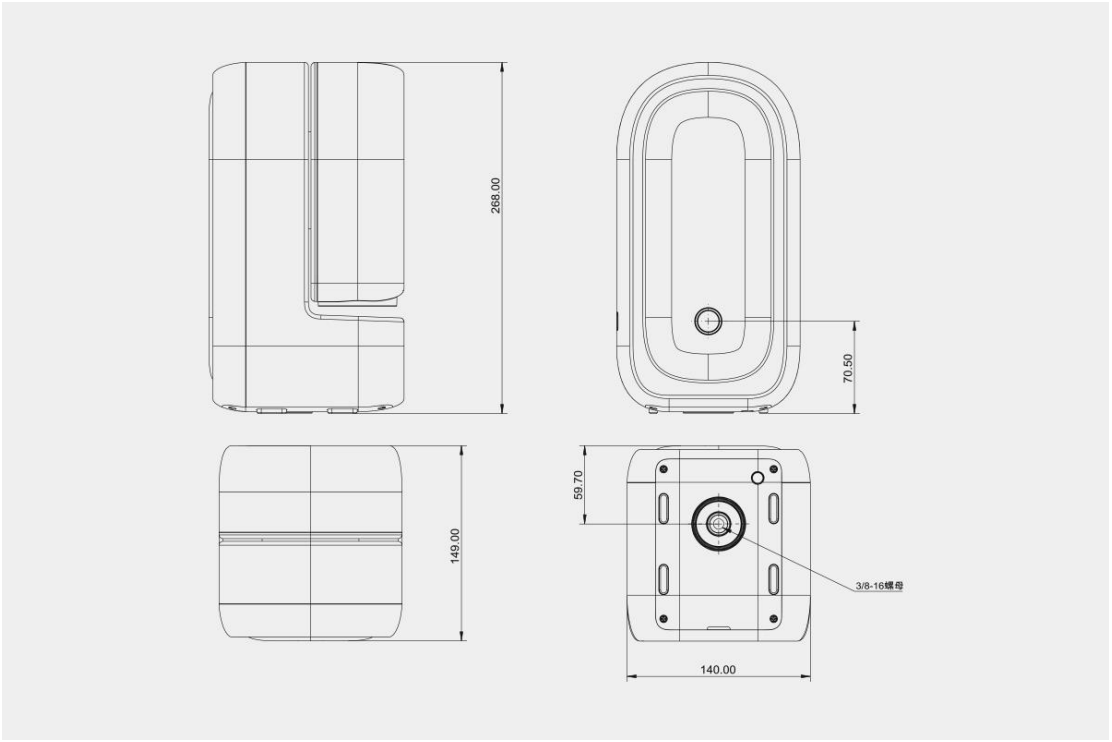
- Cloudy and windy weather conditions can also affect observations.

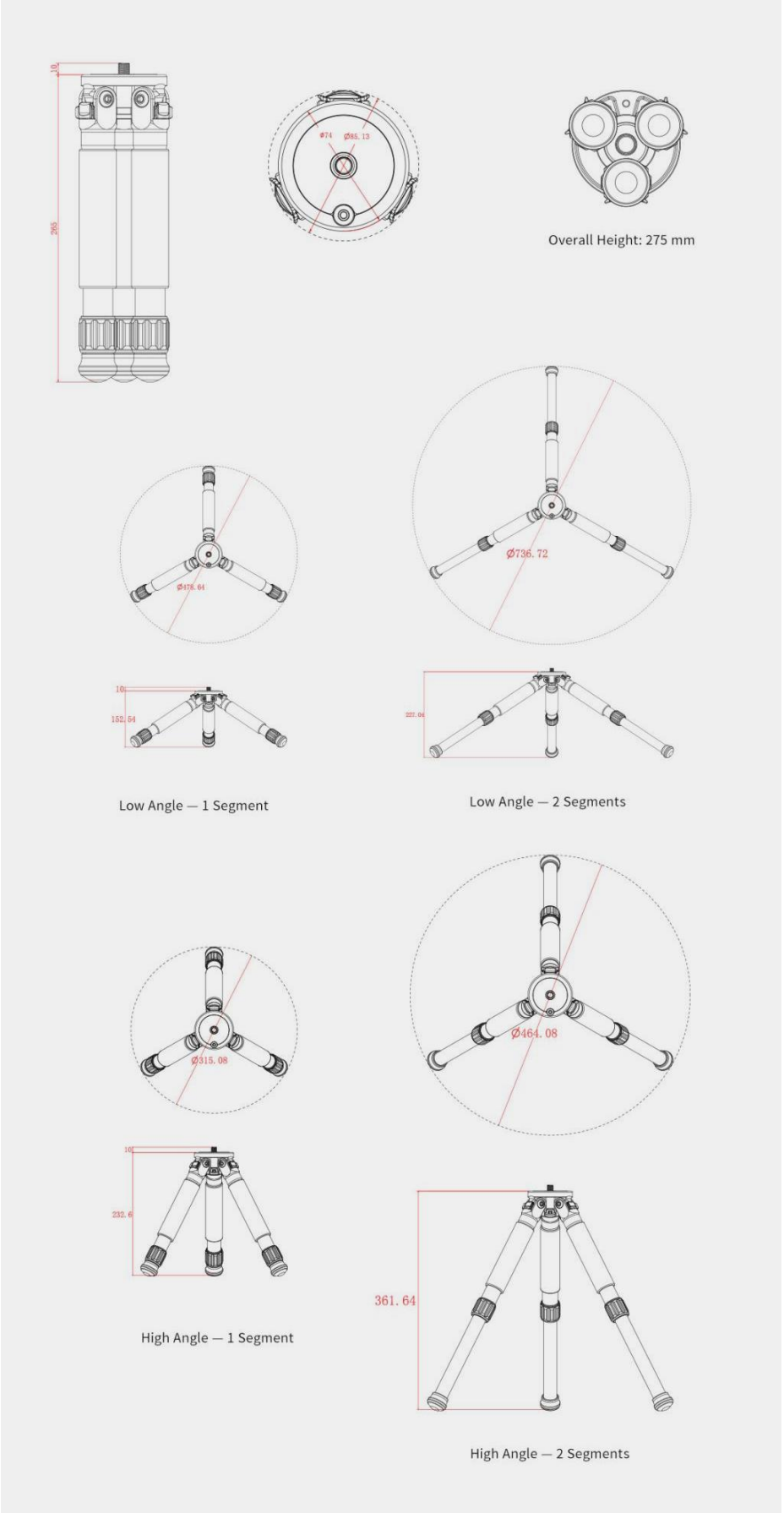
- During photography, avoid walking around the equipment to prevent vibrations that could reduce the success rate of stacking images.

- If the default field of view does not meet your photography needs, you can use the composition function in Sky Atlas to adjust the field of view, allowing for more flexible shooting perspectives.

- If observing from a balcony, courtyard, or another location with Wi-Fi access, you can enable the Station Mode in Seestar S50 Pro's network settings and connect it to Wi-Fi. The mobile device used for observation only needs to be on the same local network as the Seestar S50 Pro to establish a connection.

5. Dimensions




Overall Height: 275 mm
Ø736.72
Low Angle — 1 Segment
Low Angle — 2 Segments
Ø315.08
Ø464.08
361.64
High Angle — 1 Segment
High Angle — 2 Segments

6. Disclaimer

This product is not a toy. Please keep it and any parts or cables out of reach of children. Exercise caution when operating the product in environments where children are present.

Read the entire User Manual and familiarize yourself with the product's features before use. Improper operation of this product may result in damage to the device and property loss.

For more terms of service, please refer to the Service Agreement within the App. ZWO assumes no responsibility for any losses resulting from the improper use of this product against the guidelines outlined in the User Manual.

To the extent permitted by law, ZWO reserves the right of final interpretation of this document. ZWO may update, revise, or discontinue this document without prior notice.

Future product updates and changes will not be announced separately, and ZWO retains the right to make such modifications.

7. After-Sales Service

To update your software, please visit the official website at:

https://www.zwoastro.com/

Navigate to Support > Guides and Manuels > Seestar to download the latest updates.

For repairs and other Services:

Chinese Users : Follow the ZWO Official WeChat account and send messages to our customer service team.

Overseas Users : Visit the https://support.zwoastro.com/ page and submit a service ticket.

Email : info@seestar.com

Phone : +86 0512-65923102

1.For products returned or replaced under warranty, customers are responsible for the shipping costs to return the product. When returning the product, you must include a note detailing the actual cause of the issue and provide relevant proof, such as photos or videos.

If ZWO confirms in writing that a replacement is necessary, the user must return the product with all accessories, manuals, and packaging to the address specified by ZWO. By returning the product, you agree to pay for any non-warranty repair fees incurred during the process. The repaired or replaced product will be sent back after payment.

2.For products requiring return for after-sales service, ZWO will provide an RMA (Return Merchandise Authorization) Code for reference. ZWO will not accept any returns without prior written confirmation and a valid RMA code.

3. If your Seestar product was purchased through a ZWO authorized dealer, please contact the dealer directly for after-sales support.

8. Warranty Policy

1.ZWO offers a 2-year free warranty for products purchased directly from the company, starting from the date of receipt (1-year warranty for the battery).

2.If the user encounters a Dead-on-Arrival (DOA) issue and contacts ZWO within the specified time frame, providing proof of purchase and related documentation, ZWO will arrange for a pickup service and, depending on the situation, offer the following services: replacement (or partial replacement), repair, or refund (or partial refund).

1）Product Quality Issues : If a quality issue is identified within 30 days of receipt and confirmed by ZWO's Customer Service Center, ZWO will provide free replacement.

2）Shipping Issues : If the product packaging shows clear signs of water damage, severe compression, or deformation upon receipt, and the user provides packaging photos and proof of receipt within 3 days, ZWO will verify and offer refund or replacement for items shipped directly by ZWO or its authorized distributor. If the shipment is handled directly by the dealer, the dealer will be responsible for after-sales support.

3.The following circumstances are not covered under the warranty , but ZWO can offer repair services:

1）The product is out of warranty.

2）The product has liquid ingress, moisture damage, or corrosion.

3）Damage caused by external forces, such as scratches, deformed casing, or broken Type-C ports.

4）Unauthorized disassembly, third-party repairs, modification, firmware

flashing, or installation of incorrect firmware.

5）Alteration of the system or removal/modification of warranty seals.

6）Improper installation or use contrary to the product manual.

7）Damage due to force majeure events such as floods, fires, earthquakes, lightning, or severe impact.

8）User errors during operation or usage that result in damage.

9）Lack of valid proof of purchase or warranty certificate.

10）The product is a second-hand item.

Accessories or other components with quality issues are not grounds for returning or replacing the main device. Users can request replacement of the affected accessory separately.

Note: Any updates or modifications to this document are subject to change without prior notice.