

# Seestar S50

## User Manual



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## **Perface**

Thank you for purchasing the All-in-One smart telescope Seestar S50. (After 5 years of R&D and Integration of cutting-edge intelligent technology and humanized design , Seestar launched for astronomy enthusiasts around the world: the smart telescope Seestar S50 which is integrates popular, lightweight and intelligent design.

Seestar is a brand of intelligent astronomical equipment under ZWO. Seestar S50 is an integrated solution for smart astrophotography that integrates theodolite, telescope, camera, master control, image post-processing, etc., with a self-weight of only 2.5kg. With Seestar app, users can observ the images in the telescope lens and provide the introduction of the target, which is convenient for users to quickly carry out astronomical observation and astronomy science popularization activities.

The purpose of this manual is to introduce the use of the intelligent astronomical telescope to users in the form of text instructions and legends, and remind the possible improper operation or dangerous situation. Please ensure that you read this manual carefully before using the smart telescope, and follow the instructions carefully. Any equipment damage and personal injury caused by improper operation shall be borne by the user himself.

## Tips

This manual can guide users to use the equipment safely and efficiently. Before using the equipment, please make sure to read the following warm tips carefully, and strictly follow the guidance of this manual during actual use.

The contents of this manual are subject to change. Updated instructions on how to use this product, see Notes to the online available Manual on <https://www.seestar.com/>.

- 1、 Do not directly observe the sun without a special solar filter, which will cause irreversible damage to the product.
- 2、 Minors should use this product under adult supervision.
- 3、 Please use a proper manufacturer charger to charge the product, Seestar is not responsible for damage caused by the power charger (charger specifications: support USB BC1.2). Normal mode supports 5V 2A, fast charge mode supports up to 12V 3A).
- 4、 Privately disassembled, modified products do not enjoy the warranty policy.
- 5、 The product is a precision electronic instrument, avoid water or ash, please keep it properly when not in use.
- 6、 The front lens should not be in contact with the glass window, cloth, glasses cloth, liquid, etc., and only use the special wipes for optical lenses.
- 7、 We recommend the use of this product in 0°C to 40°C.
- 8、 Do not use chemical solvents (such as alcohol, thinners) or other cleaning liquids that can be layered, cleaning products or their accessories.
- 9、 Keep away from open flame to prevent battery explosion.
- 10 、 In the case of low temperature, the battery capacity will have different degrees of attenuation, which is the characteristics of lithium batteries, which is a normal phenomenon.
- 11、 Store the product in a clean and dry place (preferably at room temperature and humidity below 65°C). When there is a thunderstorm or the device is not used for a long time, turn off and put it away.

## Included Items



Seestar S50



Tripod



EPP Shockproof Case



Safety Guidelines



Type-C Cable



Quick Guide



Solar Filter

## 1. Product Introduction

Seestar S50 which is popular, lightweight and intelligent, simplifies the tedious process of outdoor astrophotography. Seestar S50 is the first choice for beginners.

Key Features:

- 1、Lightweight Design: Highly integrated All-in-One smart telescope, electrical focuser, astronomical camera, ASIAIR, altazimuth mount, dew heater and filter wheel into one compact body, with a self-weight of only 2.5kg.
- 2、Clean, crisp, low noise images: Seestar S50 allows you to create stunning images using the live stacking mode. The more images you capture the more color and details will grow before your eyes.
- 3、Intelligent Workflow: Auto GoTo, tracking and plate solve Smart control on Seestar app.
- 4、Dual Photography Mode: Stargazing, photography, intelligent superposition, post-processing, proficient in everything.
- 5、Database: Astronomical database, Star atlas, Encyclopedia, and Tonight's best recommendations.
- 6、Global Astro Community: Share works, communicate with friends online, get real-time weather information and more.
- 7、Self-developed System: The use of ZWO independent research and development of the motherboard, making the whole system run more stable, more convenient in the later after-sales service. The self-developed system combines a number of ZWO patented technologies to ensure system stability and shooting accuracy in use, while continuing to iterate APP development and upgrading in the later stage, increasing product functions and improving user experience.
- 8、Dual narrow-band filter: Considering that most users are in the light pollution area, we have added dual narrow-band light filter (bandwidth OIII 30nm/Ha 20nm) on the hardware, and users can manually switch to the light pollution filter in the App.

## 2. Performance Parameters

|                      |                                                               |
|----------------------|---------------------------------------------------------------|
| Product model        | Seestar S50                                                   |
| Sensor               | IMX462                                                        |
| Resolution           | 1080 x 1920                                                   |
| Aperture             | 50mm                                                          |
| Focal ratio          | f/5                                                           |
| Focal length         | 250mm                                                         |
| Optical lens         | Apochromatic triplet                                          |
| Working distance     | 30m~∞                                                         |
| Storage              | 64GB                                                          |
| Transmission         | Wi-Fi/USB-C/Bluetooth                                         |
| Wi-Fi                | 5G/2.4G                                                       |
| WiFi range           | ≤10m                                                          |
| Bluetooth range      | ≤5m                                                           |
| Working temperature  | -10°C-40°C<br>(Forced shutdown when temperature is over 60°C) |
| Charging temperature | 0-40°C                                                        |
| Mount type           | Alt- azimuth (EQ mode supported)                              |
| Slew rate            | 20X- 1440X                                                    |
| Zero position        | Mechanical                                                    |
| Battery capacity     | 6000mAh                                                       |
| Connection port      | 3/8-16 inch                                                   |
| Net weight           | 2.5kg                                                         |
| Power input          | Type-C                                                        |
| Wi-Fi reset          | Yes                                                           |
| Size                 | 142.5 X 130 X 257                                             |

## Battery Specification

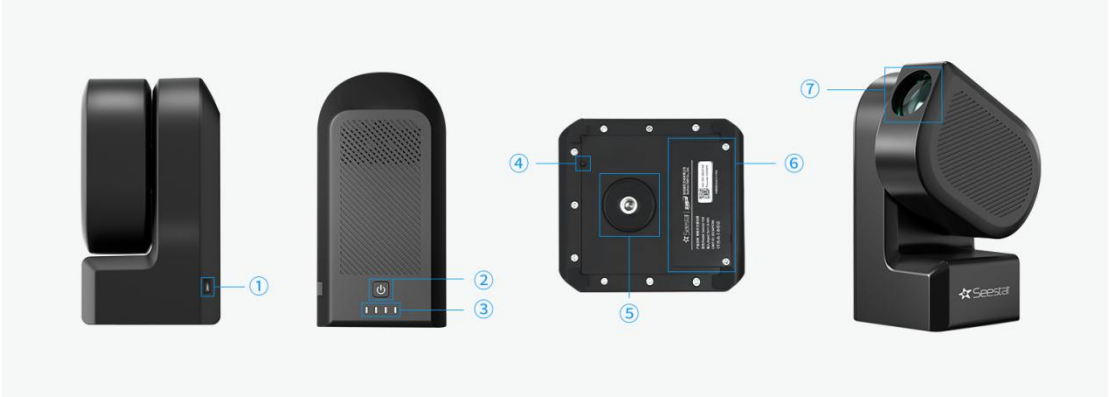


**CE** **FC** IEC62133

|                 |         |
|-----------------|---------|
| Max Charge Volt | 4.2V    |
| Rated Volt      | 3.7V    |
| Rated Capacity  | 6000mAh |
| Rated Power     | 22.2Wh  |

3. How to Use

3.1 Introduction to Seestar S50



① Charge: Type-C

② Power Button:

|                 |                                                                                    |
|-----------------|------------------------------------------------------------------------------------|
| Display         | Press when power off                                                               |
| Power On        | Press and hold for 2s<br>Yellow light on (Az-Alt Mode)<br>Green light on (EQ Mode) |
| Power Off       | Press and hold for 2s                                                              |
| Forced Shutdown | Press and hold for 6s                                                              |

③ Power indication: Display the on-off status, Wi-Fi reset status, and working status. Blinking red when the battery is lower than 15%

| Scene                     | Function                                                                                                                                                     |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Disconnect when power on  | Steady yellow                                                                                                                                                |
| Wi-Fi reset               | During the reset process, the power light flashes;<br>End of reset, Yellow light on (Az-Alt Mode)<br>Green light on (EQ Mode);<br>Reset failed, Blinking red |
| Low Power(lower than 15%) | Red flashing                                                                                                                                                 |
| Working Status            | Yellow light on (Az-Alt Mode)<br>Green light on (EQ Mode)                                                                                                    |

④ Wi-Fi Reset Button: Press and hold Wi-Fi Reset Button for 3s until Wi-Fi reset; If you cannot search for Wi-Fi after powering on Seestar S50, you can enable this button

⑤ Tripod connection interface: 3/8" screw thread

- ⑥ Battery cover: Remove the cover to replace the battery (cover screw specification: M3x8 cross countersunk self-tapping screw)
- ⑦ Pre-filter interface: If you are observing the sun, make sure to install a solar filter on this interface



Tripod :

The small tripod that comes with Seestar S50 has a maximum development height of 363mm, a storage length of 274.5mm, and a 3/8 "screw that is normally used for photography tripods at the top, which can be connected to Seestar S50 thread.

**Seestar S50 can also be connected to various photographic tripods with 3/8 "threads.**

### 3.2 Installation of Seestar S50 and App

- (1) Unfold and level the tripod and install Seestar S50 onto the tripod.



## (2) Install the Seestar app and power on the device

With Seestar app, you can shoot, superposition and post-process objects, quickly start your astrophotography journey and share your work with the global astronomy community!

Scan the following QR code or download Seestar app from the app store.



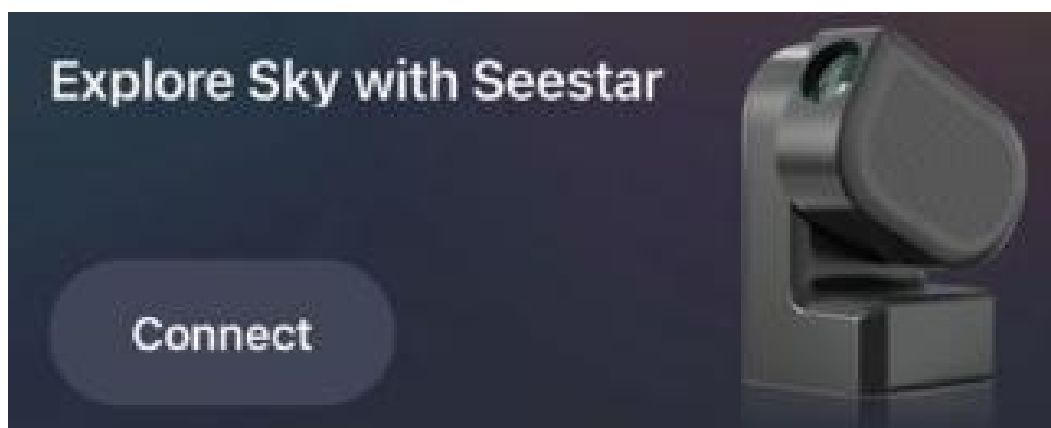
Press and hold Power button on Seestar S50 for 2s to start it.

**For the first-time boot, you need to short press the power bottom for one second and then long press for 2 seconds. Then wait for the boot after the light indicator is on.**

\* If the power supply of Seestar S50 is too low, it cannot be power on.

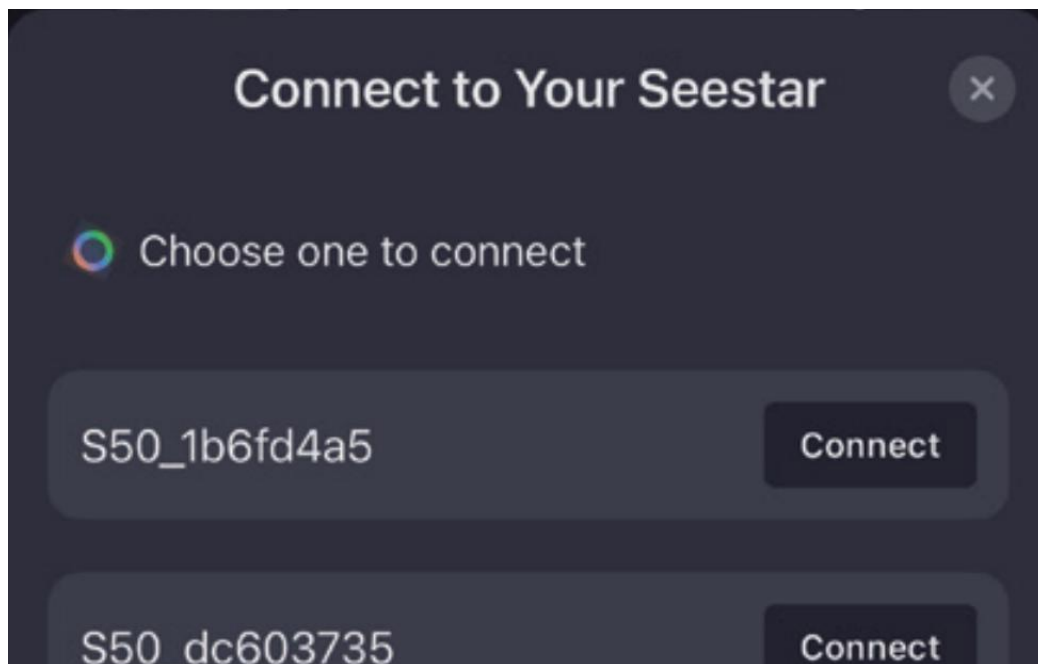
### 3.3 Connect Seestar S50

1. When you hear the voice prompt of "power on, ready to connect", stay on your phone or tablet close to Seestar. Tap the "Connect" icon on the main page of the App.

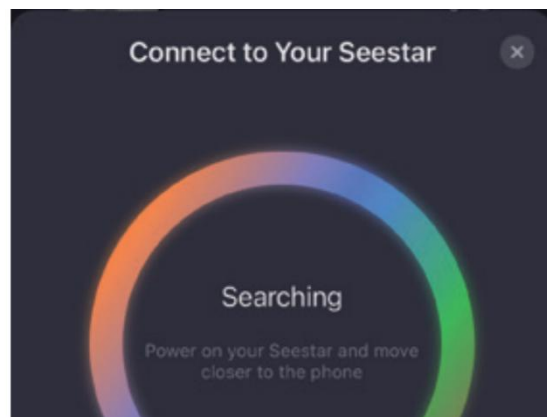
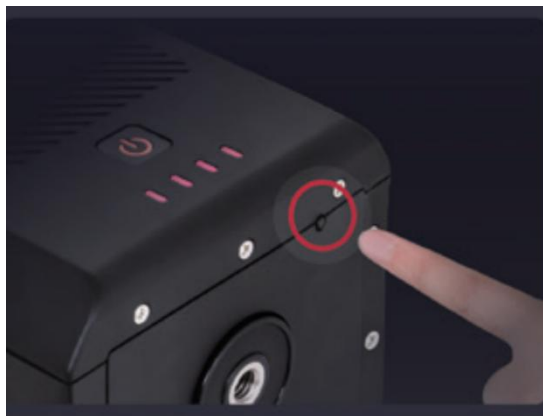


\*Note: You need to allow Seestar APP to access "Bluetooth", "Device Connection" and "Network" on your phone to complete the connection.

2. At this time, Seestar app will scan and display the nearby Seestar devices. Please select the Seestar device you want to connect to and follow the app's instructions to complete the connection.



3. If this is the first time your phone or tablet connects to Seestar, the App will remind you to press the reset button on the bottom of the Seestar device to confirm the connection.



4. For the first use of Seestar S50, the App will automatically connect to the Internet to activate the device. Please ensure your phone or tablet has access to the Internet(mobile data or Wi-Fi) during this step.



\*Note: Do not put the Seestar APP to the background or close it during activation.

If activation fails, check the Internet access of your phone or tablet and then try again. Should failure lasts, please contact our customer service.

5. Once the Bluetooth connection is successful, Seestar app will automatically connect to the Seestar device's Wi-Fi.

If the connection fails, please follow the prompts to retry or try manually connecting to Seestar's Wi-Fi:

In your phone or tablet's system settings.

navigate to "Wi-Fi" and select Seestar's Wi-Fi network (S50\_XXXXXX), enter the initial password "12345678" and wait for a moment to complete the device connection.

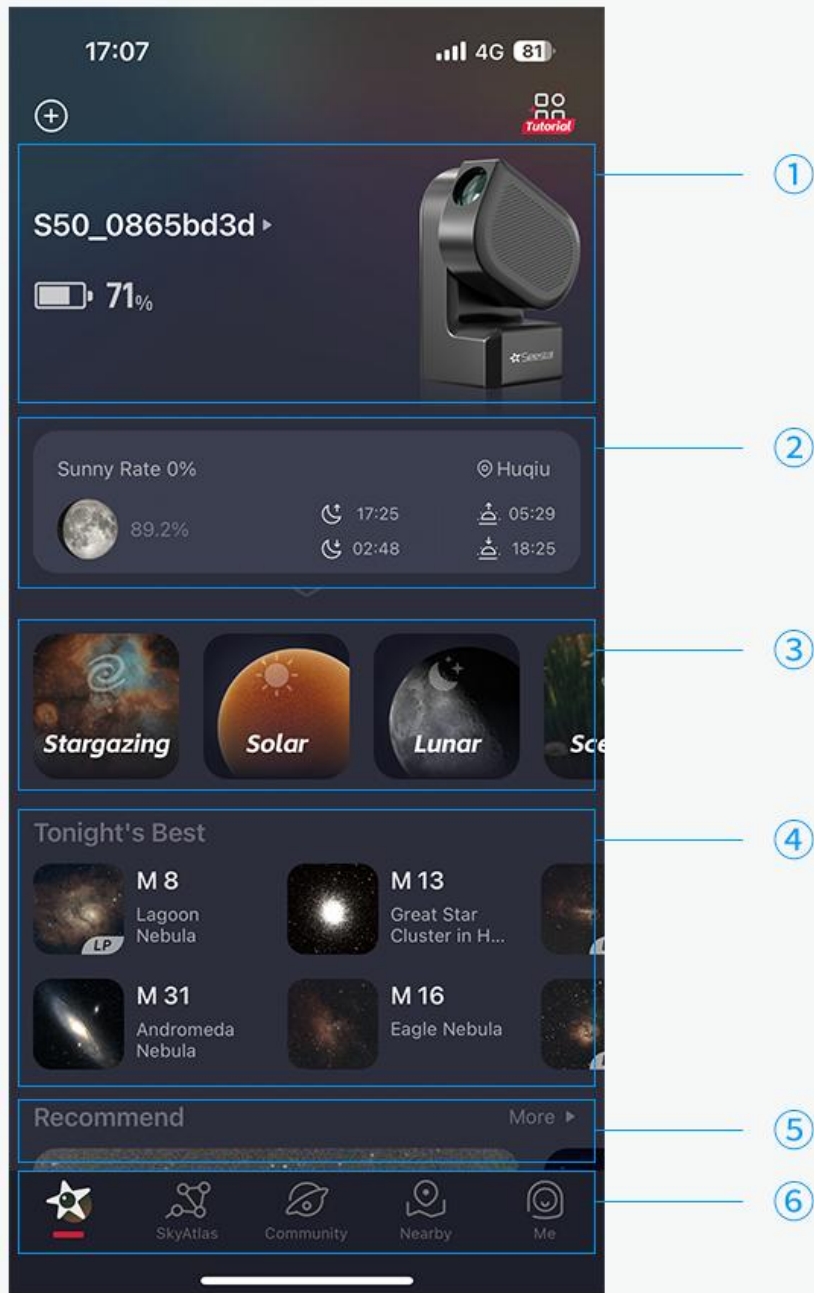


### 3.4 Introduction to Seestar app

The main features and usage of the Seestar app are introduced next. App layout as vertical version. You don't need to connect Seestar S50 to part of Seestar app.

#### 3.4.1 Home Page

Go to Home Page after connecting Seestar S50 successfully.



#### ① Device

If the device is not connected, tap the "Start Connection" button to initiate the connection of the device, as described in the section "Connecting Devices".

After the connection, the device name will be displayed. After the login account, the user nickname and device model will be displayed. If there is no login account, only device SN: S50\_93ec04a0 is displayed.

#### ② Observation-weather

Need Internet access to location, moon phase, weather information, stargazing index.

Includes: the lunar phase diagram, the percentage of the lunar surface illuminated; Temperature, cloud cover, sunset time, moonset time.

### ③ Observation Mode

The Seestar S50 has four modes: Stargazing Mode 、Sun Mode、Moon Mode and Scenery Mode.

Tap Stargazing Mode and go stargazing.

Tap Scenery Mode and go observing scenery and stars.

Note: If you touch the viewing mode card while viewing the stars (non-preview: including GoTo, AF, AC, Enhance), the App will display "Viewing the stars, need to stop".

### ④ Recommendation

Tip: You need to go online to get the latest recommended celestial articles.

Tap Recommendation to open the article page. Swipe right to see the next recommendation and swipe left to see the previous recommendation.

### ⑤ Bottom navigation bar

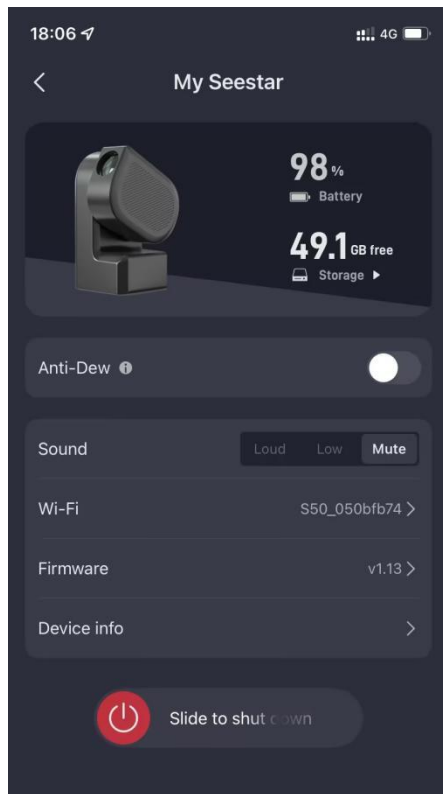
There are five columns at the bottom: Seestar S50 page, SkyAtlas page, Square page, Nearby page and My page.

SkyAtlas page: Star simulation, celestial database search, celestial encyclopedia, star map Settings, etc.

Square page: works classified display, community interaction (like, share, publish, etc.); Information such as shooting parameters, equipment and type of work is automatically brought into the publishing works page.

My page: login, register account; Account setting entry, App setting entry

### 3.4.2 Devices Management Page



You can find Device Info here and do some settings.

**Lens fog removal:** When the night humidity is too high, it is easy to create dew on the lens, just turn on the fog removal function in the Settings page, Seestar will heat the lens to prevent lens fog and dew.

**Wi-Fi:** Show the name and password of Wi-Fi.

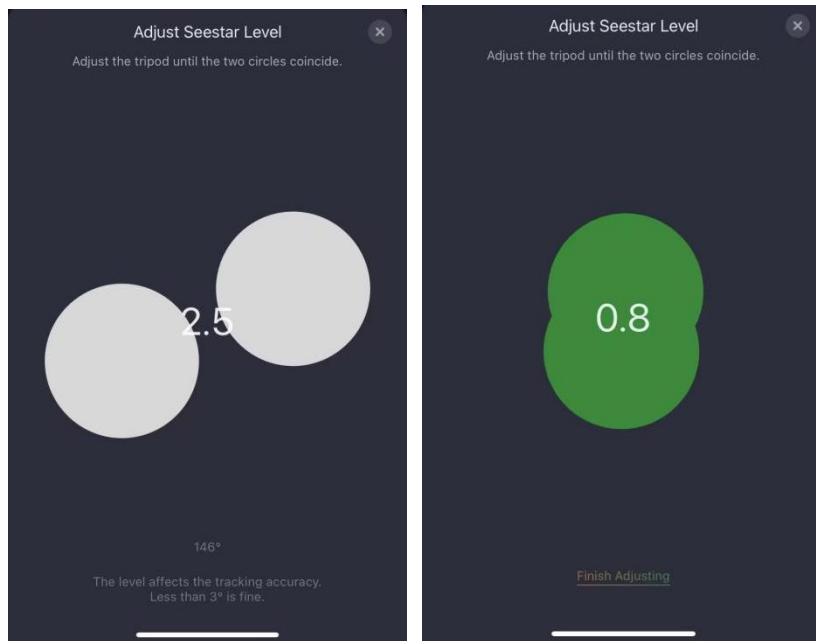
**Volume:** Seestar S50 automatic voice broadcast the current status and shooting targets, here you can adjust the volume of the device.

**Firmware:** If no new firmware is available, the existing firmware version is displayed. If the new firmware is available, the system prompts you to upgrade it. Click on it and follow the prompts.

**Device Info:** Model, SN, bound account, activation period, warranty period.

**Power Off:** Exit Seestar app at the same time.

### 3.4.3 Horizontal Adjustment

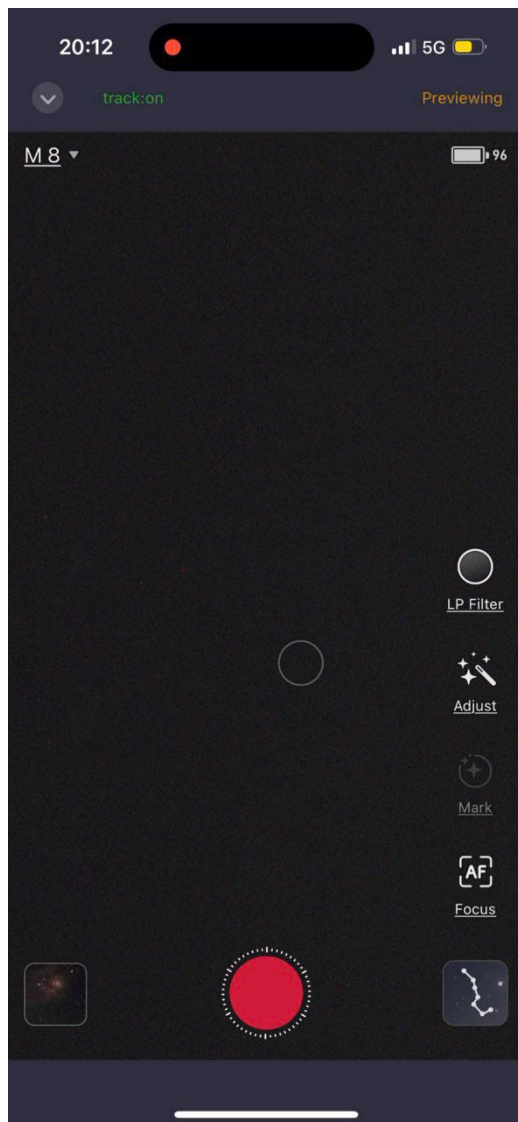


When the device card shows no level, adjust the tripod until the two circles in the picture coincide.

Adjust Seestar's tripod. When the difference is less than  $3^\circ$ , it is adjusted to a reasonable range. The smaller the value, the better.

Note: Modulation level is a necessary condition for GoTo and tracking, so modulation level cannot be skipped during observation preparation. That is, the tone level that appears under the astronomical database or after tapping the Gazing button in the star map cannot be skipped.

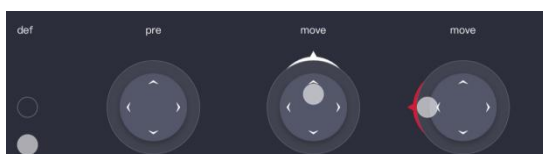
### 3.4.4 Stargazing Mode



Exit current mode



Hold and drag the bottom circle to adjust the telescope pointing, or drag the image up and down to the left and right to adjust the telescope pointing.



Tap to start autofocus



Select a celestial body and start stargazing



Labeled object



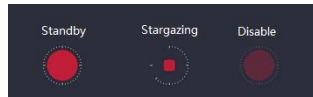
Control screen



Light damage filter can be turned on before enhancement



Tap to open the enhanced image



Tap to view local works and Seestar files

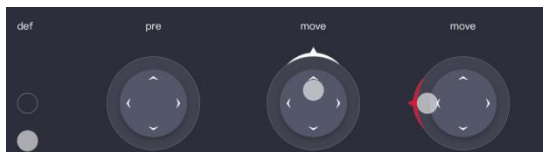
## Scenery Mode



Exit current mode



Hold and drag the bottom circle to adjust, or drag the image up and down to the left and right to adjust the telescope point.



Select the focus area of the picture and tap the button to start focus in



Tap to start autofocus



Tap to view local works and Seestar files

### 3.5 Mounting and Dismounting

#### 3.5.1 Install solar filter

**WARNING: DO NOT OBSERVE THE SUN DIRECTLY WITH SEESTAR!**

For solar observation, a specialized solar filter is needed. You can purchase it separately. Attach the solar filter to the Seestar S50 lens, then point it to the Sun. After observation, divert the lens from the Sun, and then take off the solar filter and put it away.



#### 3.5.2 Battery Removal

To remove the battery, please follow these steps:

Use a Phillips screwdriver to unscrew the two cross recessed screws (specification: M3x8 cross recessed self-tapping screws) on the bottom battery cover of the Seestar S50.

Gently detach the battery's connector from its socket.



1. Note: Before replacing or removing the battery, make sure the device is turned off and disconnected from the power source. Additionally, handle the process with care to avoid damaging the device or battery.
2. Keep the battery properly after tearing it down to prevent it from short circuit.

## **3.6 Stargazing and Scenery**

### **3.6.1 Stargazing Mode**

#### **How do I choose what I want to observe?**

On the Star Mode page, you can go to the star map and open the compass, point it at the sky, and select the target you want to observe. Or go to the object library in the star map and select the object you want to observe.

After you select a target, the Seestar device automatically points to it.

#### **How to use light filter?**

In areas with more serious light pollution, such as cities, it is recommended to turn on the light pollution filter to obtain better image effects.

Before starting to enhance the image, tap the light filter icon to turn on the light filter.

### **3.6.2 Scenery Mode**

#### **How do I adjust the Seestar device orientation?**

Hold down the screen circle to open the orientation control panel, hold down the circle and drag the circle in any direction to fine-tune the orientation of the Seestar device; Keep dragging the circle to quickly adjust the orientation of the Seestar device.

Press and hold the screen and swipe up, down, left, and right to fine-tune the orientation of your Seestar device.

#### **How to adjust the screen brightness?**

Tap the area of the screen that you want to adjust the brightness, the selection box will appear, and slide the small sun up and down to adjust the brightness of the screen.

#### **How to choose the focus area?**

Tap the area of the screen you want to focus on, a selection box appears, and then tap the AF button to initiate autofocus.

### **3.7 Shut down and Pack**

Soft shutdown :

Two ways :

1. Slide Power Off in App;
2. Press and hold for 3s.

Forced shutdown: Press and hold for 6s

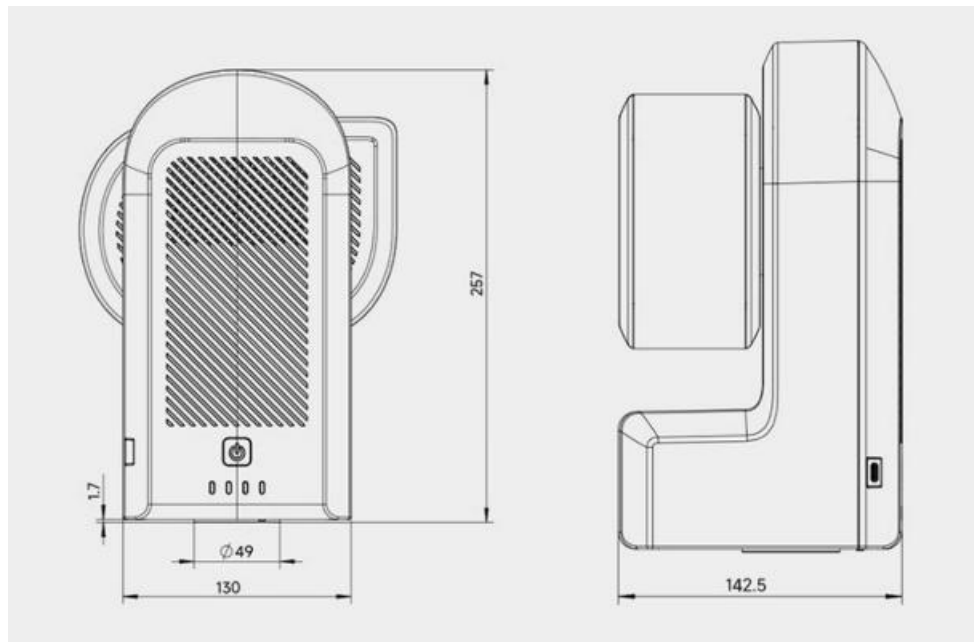
Supplement: When the battery level is below 5%, it automatically shuts down

Tip: After use, turn off the device and put it in a clean, dry place.

#### **4. Observation and Shooting Skills**

1. Objects like the Veil Nebula are difficult to observe and require very dark skies to see, and for beginners, it is recommended to start with the brightest objects, such as M31, M42, NGC104.
2. You can use this product on a balcony, garden, city or country, with at least 45° open sky.
3. Different factors will affect the quality of the observation. Such as: light damage level, atmospheric interference, light pollution, etc. To reduce the effects of light pollution, stay away from street lights, building security lights, or other direct light sources.
4. Cloudy and windy weather conditions can affect observations.

## 5. Structural Dimensions



## **6. Disclaimer**

This product is not a toy. Do not allow children to touch this product, parts, or wires. Be careful when operating in the presence of children.

You should read the entire User Manual and become familiar with the functions of the product before operating it. If this product is not operated correctly, it may result in product damage and property loss.

For more terms of service, please refer to the Service Agreement within the App. Seestar shall not be liable for any damages arising from the user's failure to use the Product in accordance with the User Manual.

In accordance with laws and regulations, Seestar reserves the right to the final interpretation of this document. Seestar reserves the right to update, amend or discontinue this document without prior notice.

Later product upgrade changes without further notice, we have the right to reserve the change.

## 7. After Sales

Software upgrade, please download the update directly to the following official website, "official website homepage -- Help Center -- Documents and manuals."

<https://www.seestar.com/>

For repairs and other services, please contact us:

Domestic users can pay attention to Zhenwang photoelectric wechat public number, click to contact customer service.

Overseas users can visit the official website Support-Contact Us and select Product to submit the work order.

Email: support@seestar.com

Phone: 0512-65923102

1. For the normal repair or replacement of products within the warranty period, the user will bear the cost of sending back. When sending back the product, the user should note the real cause of the product damage, and should provide corresponding effective proof, such as pictures or videos and other evidence.

For products that have been confirmed in writing by Seestar as requiring replacement, the User shall return the fully packaged product together with all accessories, instructions, etc. to the address designated by Seestar. By sending the product back, the user agrees to pay for any repairs that may occur during the product repair process that are not covered by the warranty service, and Seestar will send the product back for a fee.

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

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

## 8. Warranty

1. Seestar's warranty starts from the date when the product is activated and lasts 2 years. The battery's warranty period is 1 year.

2. If the user encounters the following Loss on Arrival (DOA) situation and contacts Seestar within the corresponding period to issue the product purchase invoice and relevant proof, Seestar will provide on-site pick-up service and, as appropriate, provide after-sales exchange (or partial replacement), repair or return (or partial return) service for the following products:

1) Product quality problems: Within 30 days from the date of receipt of the product, the user finds that the product has quality problems and contacts Seestar, Seestar will provide free replacement service if the product itself has quality problems or defects after testing by Seestar customer service center ;

2) Product shipping issues: After receiving the product, the user finds that the outer package of the product has obvious traces of soaking water or serious backlog and deformation, etc., and provides the relevant picture of the outer package of the product and the receipt certificate to Seestar within 3 days from the date of receiving the product. After verification by Seestar customer Service center, If the product is confirmed to be transported directly by Seestar to the user or agent, Seestar will provide the relevant return and exchange services; If the product is sold or shipped directly to the user by a Seestar agent, the Seestar Agent will be responsible for providing the relevant return and exchange services.

3. Seestar can provide users with repair services in the following cases, which are non-warranty services:

1) The product is out of warranty ;

2) Products into the liquid, moisture corrosion ;

3) Damage caused by external force (such as surface scratches, product shell deformation, Type-C port breakage, etc.);

4) Disassembly, third party repair, retrofitting and refurbishing of machines without Seestar's express written authorization (downloading the wrong firmware);

5) Product system is changed or warranty stickers are lost or changed ;

6) Product quality problems caused by installation not in accordance with the requirements of product use or instructions ;

- 7) Irresistible external force (such as flood, fire, earthquake, lightning and other strong vibration or extrusion) and other factors cause physical damage and failure of the product;
- 8) Damage caused by improper user operation during shooting or use;
- 9) No valid product purchase invoice and warranty certificate;
- 10) The products purchased by the customer are second-hand products.

With the quality problems of the accessories or other parts of the product, it is not a condition for the return of the host, and the user can separately require the replacement of new accessories.

**Note:** Any changes to this manual will be made at any time without notice.