

产品使用说明书

PRODUCT SPECIFICATION

使用之前请仔细阅读本说明书, 遵守产品说明书内的警告

Please read this specification carefully before using the product, Please follow the warnings in the specification.



MIRROSKY

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1 产品简述 Product Overview

IAZM12750 智能天文望远镜，模块化组件，安装简单快捷。MIRROSKY 程序智能识别星空，快速精准定位任意星体，帮助初次接触天文观测的爱好者轻松遨游浩瀚星空。

IAZM12750, the smart AZMOUT is a modular component that is easy and quick to install. The Smartalign program can recognize the starry sky and position any star quickly and accurately, enabling astrophiles to observe the starry sky freely.

IAZM12750 智能天文望远镜，配备了高品质的 127MM 口径的马克斯托夫 - 卡塞格林式主镜以及 50MM 口径的光学寻星镜，可以观测行星和星云，拓宽了天文望远镜的用途，满足初级爱好者深空的探索欲，使得设备更具性价比。

The whole telescope is equipped with a high-quality 127mm Maksutov-Cassegrain coated optical lens, a 50mm high-definition optical finder set for observing planets and nebulae. It broadens the use of longitude and latitude ceremony astronomical telescope, satisfies the desire of beginners to explore deep space, and makes the device more cost-effective.

2 主要功能 Main Functions

2-1 配备有电子罗盘和光电传感器，望远镜坐标自动初始化；

2-1 Equipped with an electronic compass and photoelectric sensor, realizing automatic initialization of telescope coordinates;

2-2 配备有 WIFI 模块，通过手机和平板电脑 APP 控制望远镜；

2-2 Equipped with a WIFI module, controlling the telescope through mobile phone and tablet PC app;

2-3 配备有智能相机模组可以智能识别星空，引导天文望远镜自动精准指向目标星体；

2-3 Equipped with a smart camera module which can intelligently recognize the starry sky and guide the astronomical telescope to automatically and accurately point to target stars;

2-4 配备有长焦和短焦双镜头，支持目视观测和摄影不同类型的星体；

2-4 Equipped with dual lenses of long and short focus, supporting visual observation and photography of different types of stars;

2-5 配备有多核图像处理芯片，实时多帧叠加深空星云图像；

2-5 Equipped with a multi-core image processing chips that can realize real-time multi frame stacking of deep space nebula images;

2-6 配备有 64GB 大容量存储芯片，可以录制无损行星视频；

2-6 Equipped with a 64GB large capacity storage chip, capable of recording lossless planetary videos;

2-7 配备有高速 USB2.0 接口，快速读取视频和图片至 PC 电脑；

2-7 Equipped with a high-speed USB2.0 interface for fast reading of videos and images to PC;

! 警告 Warning

3-1 不要通过望远镜观看太阳，通过望远镜观察太阳或其他强光源可能会导致永久性的眼睛损伤；

3-1 Do not observe the sun through a telescope, as observing the sun or other strong light sources through a telescope may cause permanent eye damage;

3-2 请勿在存在易燃气体的情况下使用电子设备，因为这可能会导致爆炸或火灾；

3-2 Do not use electronic devices in the presence of flammable gases, as this may cause explosions or fires;

3-3 放在儿童接触不到的地方，否则可能会导致受伤，此外，请注意，小零件构成窒息危险，当孩子吞下本设备的任何部分时，立即咨询医生；

3-3 Keep it out of reach of children, otherwise it may cause injury. Additionally, please note that small parts pose a choking hazard. If a child swallows any part of this device, consult a doctor immediately;

3-4 请勿拆卸、触摸产品内部部件，可能会导致人身伤害和 / 或使保修失效。如果发生故障，请取出电池并联系 MIRROSKY 授权服务中心；

3-4 Do not disassemble or touch the internal components of the product, as it may cause personal injury and/or invalidate the warranty. If a malfunction occurs, please remove the batteries and contact the MIRROSKY authorized service center;

3-5 通知 Notification

① MIRROSKY 保留随时更改本手册中描述的硬件和软件规格的权利，恕不另行通知；

① MIRROSKY reserves the right to change the hardware and software specifications described herein at any time without prior notice;

② MIRROSKY 不对因不当使用本产品而造成的任何损害负责；

② MIRROSKY assumes no liability for any damage caused by improper use of this product;



4 外观说明 Appearance



5 接口说明 Interface Description



6 安装相机 Install the camera

第一步 安装三脚架

Step 1 Install the tripod



首先展开三脚架，向下按压三脚架上的黑色支撑杆确保三角架完全展开。如图所示：黑色置物盘中心孔对准黑色支撑杆中心然后旋转黑色置物盘，将置物盘的卡扣与黑色支撑杆的卡槽牢固安装。

Firstly, unfold the tripod and press down on the black support rod on the tripod to ensure that the tripod is fully unfolded. As shown in the figure: Align the center hole of the black storage tray with the center of the black support rod, then rotate the black storage tray to firmly install the buckle of the storage tray and the slot of the black support rod.

第二步 安装经纬仪托架

Step 2 Install the theodolite bracket



三脚架托盘上有三个螺丝，经纬仪托架底部有三个螺丝孔，如图所示，将经纬仪托架底部的三个螺丝孔与三脚架托盘上的三个螺丝对齐并拧紧螺丝。

There are three screws on the tripod tray, and three screw holes at the bottom of the theodolite tray, as shown in the figure. Align the three screw holes at the bottom of the theodolite tray with the three screws on the tripod tray and tighten the screws.

第三步 安装镜头

Step 3 Install the lens



保持镜头鸠尾板上的限位槽和经纬仪托架上的鸠尾板卡槽上的限位槽处于同一侧，把镜头装入经纬仪支架上的鸠尾板卡槽内并拧紧螺丝。

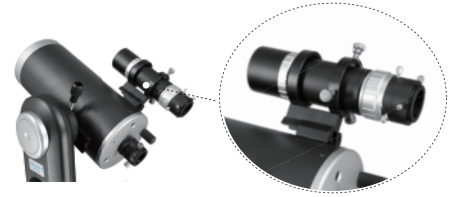
Keep the limit slots on the lens dove-tail plate and that on the dove-tail plate slot of the theodolite bracket on the same side, install the lens into the dove-tail plate slot on the theodolite bracket and tighten the screws.

天顶镜的 1.25 英寸接口装入镜头的 1.25 英寸接口并拧紧螺丝。目镜的 1.25 英寸接口装入天顶镜的 1.25 英寸接口并拧紧螺丝。

Install the 1.25-inch interface of the zenith lens to the 1.25-inch interface of the lens, and tighten the screws. Install the 1.25-inch interface of the eyepiece into the 1.25-inch interface of the zenith lens, and tighten the screws.

第四步 安装寻星镜

Step 4 Install the star finder

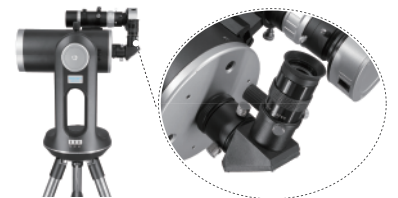


首先将寻星镜装入抱箍环内并拧紧抱箍环上的螺丝，然后将寻星镜抱箍环上的鸠尾板与镜头上的鸠尾板卡槽对齐装入寻星镜组件，拧紧鸠尾板卡槽上的螺丝。

Firstly, install the star finder lens into the clamp ring and tighten the screws on the clamp ring. Then, align the dove-tail plate on the star finder lens clamp ring with the dove-tail plate slot on the lens and install it into the star finder lens component. Tighten the screws on the dove-tail plate slot.

第五步 安装目镜

Step 5 Install the eyepiece



天顶镜的 1.25 英寸接口装入镜头的 1.25 英寸接口并拧紧螺丝。目镜的 1.25 英寸接口装入天顶镜的 1.25 英寸接口并拧紧螺丝。

Connect the 1.25-inch interface of the zenith lens to the 1.25-inch interface of the lens, and tighten the screws. Connect the 1.25-inch interface of the eyepiece into the 1.25-inch interface of the zenith lens, and tighten the screws.

第六步 安装相机

Step 6 Install the camera



相机的 1.25 英寸接口装入寻星镜，旋转相机保持相机外壳上“UP”的标识朝向天空，拧紧寻星镜上的螺丝固定好相机（注意：相机的 1.25 英寸接口要完全装入寻星镜）

Install the 1.25-inch interface of the camera into the star finder lens, rotate the camera to keep the "UP" mark on the camera casing facing the sky, tighten the screws on the star finder lens to secure the camera (note: the 1.25 inch interface of the camera should be fully installed into the star finder lens)

相机模组有一个标识“CAMERA”的 TYPE C USB，经纬仪托架上也有一个标识“CAMERA”的 TYPE C USB，使用 TYPE C USB 线将相机与经纬仪托架连接好。（注意：相机模组和寻星镜无间隙）

The camera module has a TYPE C USB labeled "CAMERA", and there is also a TYPE C USB labeled "CAMERA" on the theodolite bracket. Connect the camera to the theodolite bracket using TYPE C USB cable. (Note: There shall be no gap between the camera module and the star finder lens)

7 寻星前的准备工作 Preparation before Star Finding

第一步 启动经纬仪托架

Step 1 Start the theodolite bracket



使用包装内附赠的 C to C 连接线, 将经纬仪托架上印有“POWER”的 TYPEC 接口连接, 支持 12V 输出的移动电源, 或者是 12V 2A 以上的直流电源, 也可以选择为托架上的电池仓装入 8 节 5 号电池, 即可启动经纬仪托架和相机。

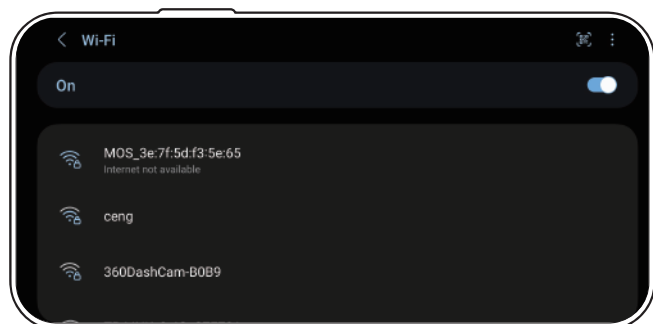
Connect the TYPE C interface marked with "POWER" on the theodolite bracket to a mobile power source that supports 12V output, or a DC power supply of 12V 2A or higher. Alternatively, or mount eight AA batteries to the battery compartment on the theodolite bracket to start the theodolite bracket and camera.

第二步 MIRROSKY APP 与望远镜系统组网

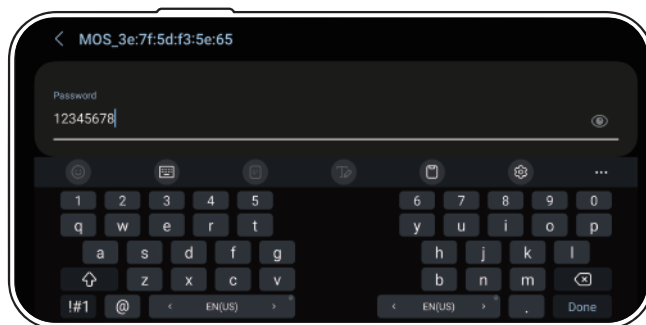
Step 2 Networking MIRROSKY APP and Telescope System

首次使用望远镜, 经纬仪托架接入直流电源 30 秒之后, 软件系统正常工作, 在手机或平板 EIFI 列表里找到名为 MOS_XX:XX:XX:XX:XX 的 SSID, 输入密码: 12345678, 选择 Always connect 即可完成与望远镜无线组网。打开 MIRROSKY APP 可以看到 UI 界面上显示绿色的 CONNECT 标识, 标识 APP 与望远镜成功组网。

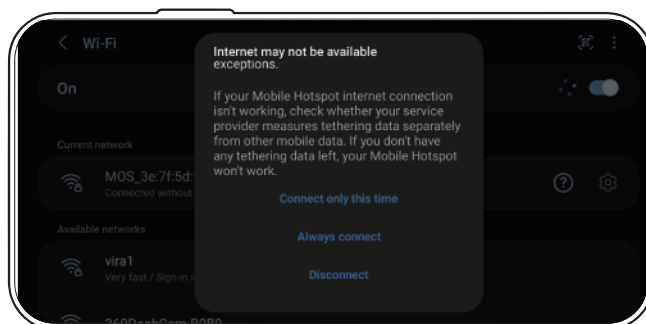
When the telescope is used for the first time, the software system works normally 30 seconds after the theodolite bracket is connected to a DC power supply. Find the SSID named MOS_XX:XX:XX:XX:XX from your phone or tablet PC EIFI list, enter the password 12345678, and select "Always connect" to complete wireless networking with the telescope. Start the MIRROSKY APP. You will see a green CONNECT mark on the UI, indicating that the APP has successfully connected to the telescope.



- ① 选择 SSID 名为 MOS_XX:XX:XX:XX:XX 的 WIFI
- ① Select the WIFI, with the SSID named MOS_XX:XX:XX:XX:XX



- ② 输入 WIFI 密码: 12345678
- ② Enter the WIFI password: 12345678



- ③ 选择 Always connect
- ③ Select "Always connect"



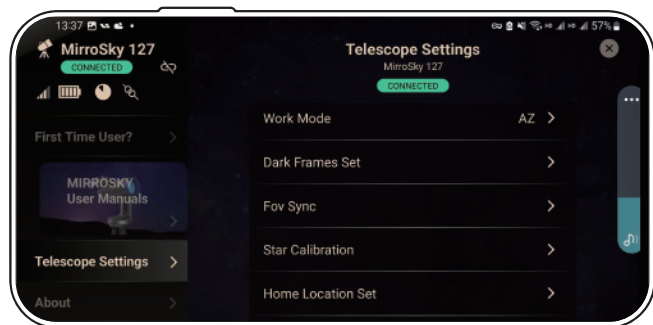
- ④ 进入 MIRROSKY APP CONNECTED 图标为绿色
- ④ Enter the MIRROSKY APP CONNECTED, showing the icon in green

第三步 校准寻星镜和马克卡主镜头的同轴度

Step 3 Calibrate the coaxiality between the star finder and the Maksutov-Cassegrain main lens

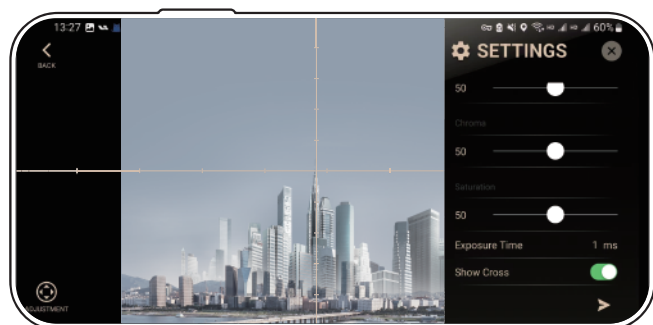
每台望远镜出厂前已经校准好主镜与寻星镜的同轴度, 校准同轴度是为了方便使用主镜观测到 APP 中所选择的目标天体, 若需要再次手动校准, 则可参考如下步骤

To each telescope is factory-calibrated for the alignment of the primary mirror and the star finder scope. Coaxial calibration is performed to facilitate the observation of celestial objects selected in the app using the main mirror. If manual recalibration is necessary, you can follow the steps below:



① 打开 MIRROSKY APP, 在 APP 界面左侧找到 TELESCOPE SETTING 菜单, 点击此菜单打开望远镜功能设置界面, 在设置界面里找到 FOV SYNC 菜单, 打开此菜单开启视频功能。

① Start the MIRROSKY APP. Find the TELESCOPE SETTING menu on the left side of the app interface, click this menu to open the telescope function setting interface. Find the FOV SYNC menu in the setting interface, and open this menu to activate the video function.



② 视频页面右侧设置菜单里可以设置曝光和 ISO 参数, 开启或者关闭 “+” 字参考线。

② The exposure and ISO parameters can be set in the Settings menu on the right of the video page. Enable or disable the “+” reference line.



③ 将望远镜对准 2KM 以外的参照物, 旋转寻星镜的调焦环直至视频界面里能清晰成像, 旋转马卡主镜头的调焦手柄直至目镜视场内清晰成像。

③ Point the telescope at a reference object 2KM away, rotate the focusing ring of the star finder until clear images are shown in the video interface. Rotate the focusing handle of the Maksutov-Cassegrain main lens until clear images are shown in the eyepiece field of view.



④ 分别调整固定寻星镜抱箍上的螺丝, 直至 MIRROSKY APP 视频中心成像位置与马卡主镜头目镜视场内的中心成像位置一致, 至此寻星镜和马卡主镜头的同轴度调整完毕。

④ Adjust and fix the screws on the star finder clamp ring separately until the MIRROSKY APP video center imaging position is consistent with that in the eyepiece field of view of the Maksutov-Cassegrain main lens. At this point, the coaxiality between the star finder lens and Maksutov-Cassegrain main lens has been adjusted.

第四步

调整经纬仪托架水平度

Step 4

Adjust the levelness of the theodolite bracket



为了提高望远镜的指向精度需要保持调整经纬仪托架水平, 经纬仪托架上有水平液泡仪, 如果液泡在水平液泡仪十字中心表示经纬仪托架处于水平状态,

To improve the pointing accuracy of the telescope, the theodolite bracket needs to be kept level. There is a spirit level on the theodolite bracket. If the bubble is in the center of the spirit level, it indicates that the theodolite bracket is horizontal.

若不在中心则表示经纬仪托架处于非水平状态, 此时拧开三脚架下方的伸缩节锁紧螺丝, 调整三脚架的倾斜角度直至水平液泡仪里的液泡在十字中心后, 拧紧伸缩节锁紧螺丝完成水平调整。

Otherwise, it indicates that the theodolite bracket is in a non-horizontal state. At this point, unscrew the fixing screws of the expansion joint below the tripod and adjust the tilt angle of the tripod until the bubble in the spirit level is in the center, and tighten the fixing screws of the expansion joint.

第五步

调整寻星镜对焦状态

Step 5

Adjust the focal length of the star finder lens



旋转寻星镜头上的焦距调节环至无限远标识处 “∞”, 此时图像传感器完成对焦

Rotate the focus adjusting ring on the star finder lens to the image sensor focus position at the infinity mark “∞” .

8 寻星以及星空摄影 Star Finding and Sky Photography

GOTO 不同类型的星体

GOTO different types of stars

在 MIRROSKY APP 星图里选择你要观测的恒星、星云或星团，点击“GOTO”按钮，智能相机控制经纬仪托架精准指向选择的观测目标。提示：如果开机第一次选择的目标星体是：月亮、土星、木星或者火星，请先 GOTO 行星附近的恒星，待一星校准完成之后再 GOTO 月亮、土星、木星或者火星，能大幅度提高望远镜指向行星的精度，使其准确的出现在寻星镜视场范围内，只要微调望远镜的俯仰角度，目标行星就可以进入视场中心，方便目视以及摄影。

Select the star, nebula, or open cluster you want to observe from the MIRROSKY APP star map and click the "GOTO" button. The smart camera controls the theodolite bracket to accurately point to the selected observation target. Reminder: If the first selected target is the moon, Saturn, Jupiter, or Mars, GOTO the fixed star near the planet first. After the single-star calibration is completed then GOTO the moon, Saturn, Jupiter, or Mars. Since the accuracy of the telescope pointing at the planet has been greatly improved, they can be within the field of view of the star finder. As long as the pitch angle of the telescope is slightly adjusted, the target planet can enter the center of the field of view, facilitating visual observation and photography.



星云或星团的拍摄方法

Photography methods for nebulae or open stars

寻找到星云或星团之后，MIRROSKY APP 界面右侧弹出相机参数设置图层，设置好 ISO 参数曝光时间参数，连续拍摄数量参数，图像叠加参数，点击 MIRROSKY APP 界面下方的拍摄按钮即可进入拍摄状态。MIRROSKY APP 拍摄状态界面里显示摄影进度，你也可以点击图像中心进入全屏模式，即可查看星云或者星团实时叠加的状态。拍摄完成之后，可以调整照片的色阶参数、饱和度参数、对比度参数、曝光参数、降噪参数等直至图像达到你认可的效果，即可选择 SAVE 按钮保存图片至手机或者平板电脑的相册，方便你及时分享你的成果（提示：由于经纬仪无法长时间拍摄星云建议拍摄参数设置如下：ISO 400/ISO 800 EXP: 20000MS 设置数量：20~25 张）

After finding any nebula or an open star, a camera parameter setting layer pops up on the right side of the MIRROSKY APP interface. Set the ISO parameters, exposure time, number of consecutive shots, and image stacking, and click the Shoot button at the bottom of the MIRROSKY APP interface to enter the shooting state. The MIRROSKY APP shooting status interface displays the shooting progress. You can also click on the image center to enter full screen mode to view the real-time stacking status of nebulae or open star clusters. After shooting, you can adjust the color scale, saturation, contrast, exposure, noise reduction parameters, etc. of the photos until you get the desired effects. You can press the SAVE button to save the photos to an album on your phone or tablet PC, so that you can share the photos in a timely manner (Reminder: Since the theodolite can't photograph nebulae for a long time, it is recommended to set the shooting parameters as follows: ISO 400/ISO 800 EXP: 20000MS Number of settings: 20~25)



如何录制月亮或行星的视频

How to record a video of the moon or planet

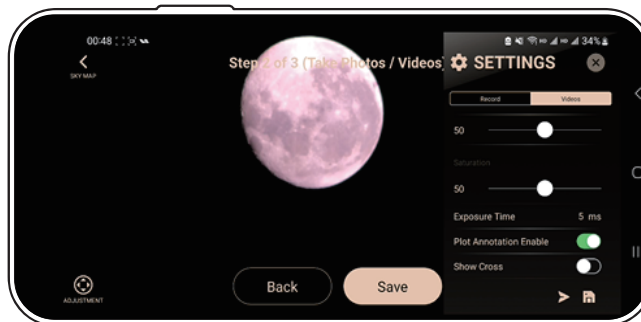
寻找到月亮或行星之后，MIRROSKY APP 界面右侧弹出相机参数设置图层，设置好 ISO 参数，曝光时间参数，视频录制时间参数，点击 MIRROSKY APP 界面下方的录制按钮即可进入录制状态。After finding the moon or planet, a camera parameter setting layer pops up on the right side of the MIRROSKY APP interface. Set the ISO parameters, exposure time and video recording time, and click the Record button at the bottom of the MIRROSKY APP interface to enter the recording state.

MIRROSKY APP 拍摄状态界面里显示录制进度，你也可以点击图像中心进入全屏模式，即可查看星云或者星团实时叠加的状态。

The MIRROSKY APP shooting status interface displays the recording progress. You can also click on the image center to enter full screen mode to view the real-time stacking status of nebulae or open star clusters.

录制完成之后即可选择 SAVE 按钮保存视频至手机或者平板电脑的相册，方便你及时分享你的成果。高清的月亮或行星需要通过 PC 软件连接相机 USB 或 WIFI 下载原始的视频，通过视频处理软件得到高清的月亮或行星图片。

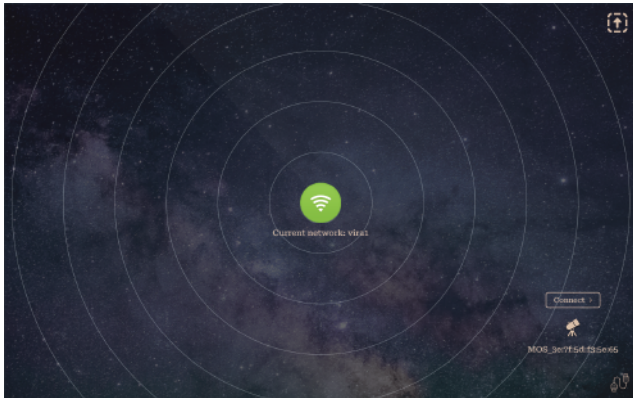
After recording, you can press the SAVE button to save the photos to an album on your phone or tablet PC, so that you can share the photos in a timely manner. To get high-definition images of the moon or planet, connect PC software to the camera USB or WIFI to download the original video. High-definition images of the moon or planet can be obtained through video processing software.




9


如何使用PC软件管理智能相机内存储的文件

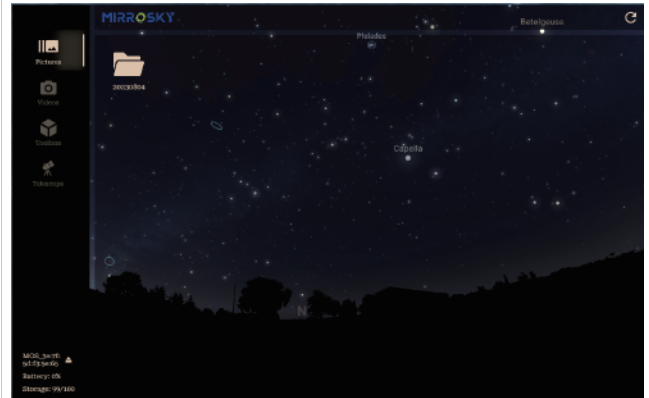
If using PC software to manage files stored in the smart camera



相机模块接入 5V 电源或者使用 USB 线接入电脑，

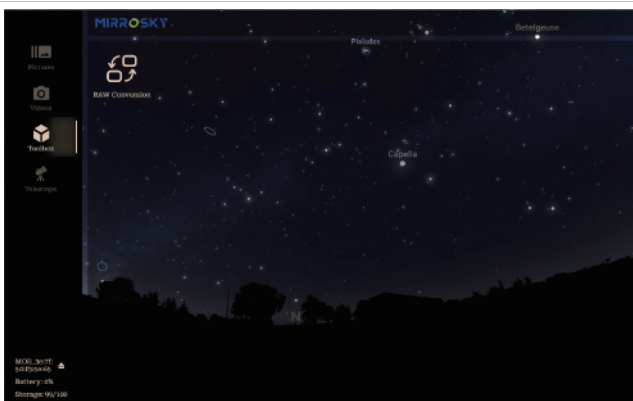
点击图标  打开 MIRROSKY PC 客户端软件，进入 PC 客户端主界面

Connect the camera module to a 5V power supply or to a computer using USB cable. Click the icon  to open the MIRROSKY PC client software and enter the PC client main interface.



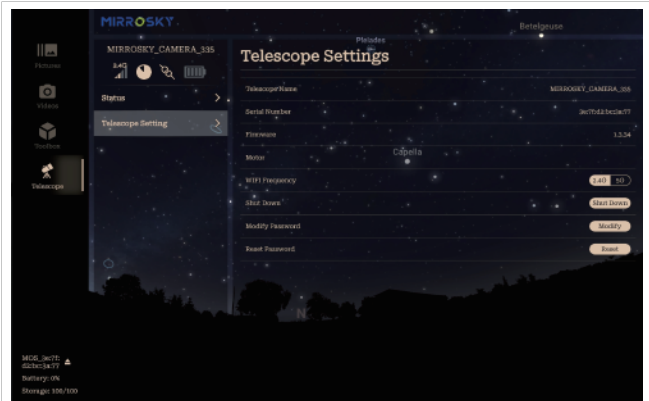
图片下载页面

Image download page



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Image format conversion page



修改相机 WIFI 密码界面

Change camera WIFI password interface



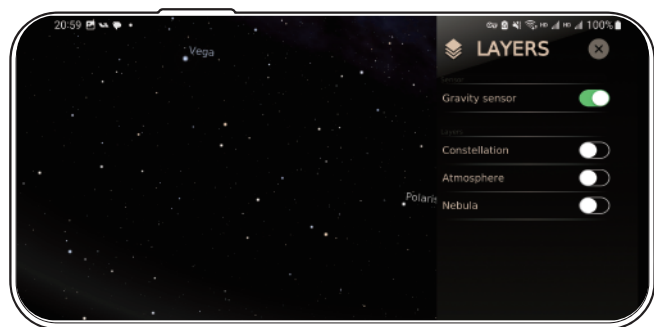
使用小贴士 Tips for use

① 如何精确指向月亮以及行星 How to accurately point to the moon and planets



① GOTO 星体之前调整三脚架让望远镜处于水平状态，可以大幅提高一星校准之后望远镜的指向精度。

① Adjust the tripod before GOTO star to make the telescope horizontal, which can greatly improve the pointing accuracy of the telescope after calibration.



② 调整寻星镜的角度保持与主镜同轴，点击星图的 LAYER 图标打开设置图层开启 Gravity sensor 功能，举起手机此时星图与当前的星空同步移动，选择任意一颗 ALT=(20 度~50 度) 的恒星，

② Adjust the angle of the star finder lens to keep it coaxial with the main lens. Click on the LAYER icon in the star map to enable the settings layer and activate the Gravity sensor function. Raise your phone, making the star map move synchronously with the current starry sky. Select any fixed star with ALT=(20~50°),



③ 点击 GOTO 按键望远镜会自动寻找此恒星，经过坐标校准之后再 GOTO 月亮、行星即可在寻星镜里看到月亮或者行星，微调望远镜的角度让月亮或者行星至寻星镜视场中心，通过目镜目视观察月亮或行星，也可以使用相机录制视频。

③ click the GOTO button, and the telescope will automatically find this fixed star. After coordinate calibration, GOTO the moon and planet to observe the moon and planet in the star finder lens. Slightly adjust the angle of the telescope, making the moon or planet move to the center of the field of view of the star finder. You can visually observe the moon or planet using the eyepiece or record video using a camera.

② 如何观察太阳 How to observe the sun

由于太阳光照能量强烈，未安装太阳膜之前禁止直接使用望远镜观察太阳，不然会永久损坏相机和你的眼睛。

Due to the strong energy of sunlight, it is forbidden to observe the sun directly with a telescope without installing a solar film, otherwise it will permanently damage the camera and your eyes.

请按照图示正确安装太阳膜再观察太阳。

Please install the solar film correctly according to the diagram before observing the sun.



寻星镜和马克斯托夫主镜太阳膜
Solar film of star finder lens
and Maksutov main lens



① 马克斯托夫主镜安装太阳膜
Install the solar film of
Maksutov main lens



② 寻星镜安装太阳膜
Install the solar film of star
finder lens

3 如何拍摄星云 How to photograph a nebula

IAZM12750 智能天文望远镜无法长时间曝光拍摄星云，建议拍摄参数设置如：ISO 400/800 EXP: 20S，拍摄数量：20-30 张；

The AZMOUT cannot be used to photograph a nebula under long-term exposure. It is recommended to set the shooting parameters as ISO 400/800 EXP: 20S, number of shots: 20-30 photos;

为了提高图像质量，拍摄星云之前系统会提示：是否需要拍摄暗场？如果你需要拍摄，请使用镜头盖遮挡寻星镜，直至暗场拍摄完毕再拿开镜头盖正常拍摄星云。

In order to improve the photo quality, the system will prompt before you photograph a nebula: Do you need to snap dark frames? To photograph a nebula, please cover the star finder lens until you snap dark frames. After that, remove the lens cover and photograph a nebula.

No dark frames exist, snap dark frames now? if you want to snap dark frames, plz cover the lens first.

No

Yes

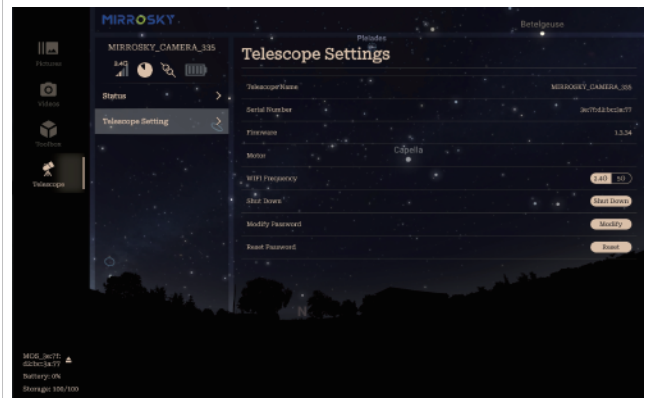
镜头盖遮挡可拍摄暗场
Cover the lens to snap dark frames



镜头盖未遮挡
Lens not covered

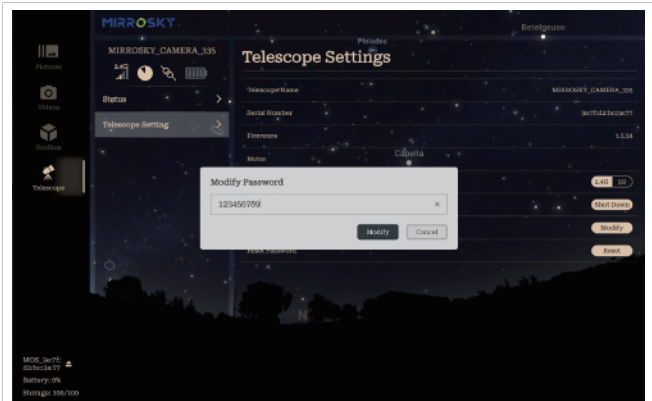


4 管理相机 WIFI 密码 Managing Camera WIFI Password



相机 USB 接口与 PC USB 接口连接后，打开 MIRROSKY PC 软件，进入 TELESCOPE SETTING 页面，点击 Modify Password 按钮进入密码设置页面，输入新的密码。

Connect the camera USB interface to the PC USB interface, then start the MIRROSKY PC software and enter the TELESCOPE SETTING page. Click the Modify Password button to enter the password setting page and enter a new password.



如果你忘记设置的新密码，可点击 RESET 按键，WIFI 密码恢复为初始密码：12345678

If you forget the new password, click the RESET button, the WIFI password will be restored to its original password: 12345678..