MirroSky Series
HX35 / GX35 EQ/AZ
Smart Telescope

*Shown with optional ota and tripod

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INTRODUCTION

Thank you for choosing the HX35/GX35 Equatorial Mount, a significant step forward in professional-grade smart astronomy.

These mounts are engineered for versatility, allowing you to transition effortlessly between simple visual observation and advanced astrophotography. Both the HX35 (Harmonic Gear) and GX35 (Worm Gear) models offer dual functionality:

- **Alt/Azimuth (Alt/Az) Mode:** Ideal for quick setup, simple visual use, short-exposure astrophotography and observing terrestrial objects.
- **Equatorial (EQ) Mode:** Essential for long-exposure astrophotography and precise, automated celestial tracking.

The HX35 and GX35 mounts come standard with the revolutionary MirroSky Intelligent Camera System. This system is the brain of your telescope, featuring:

- **Plate-Solving Technology:** Automatically points to celestial objects without requiring a manual night sky alignment.
- **Included Imaging Equipment:** The 53mm ED refractor and a color camera with an IMX662 sensor can be used as your primary imaging scope (automatically tracking and stacking images) or as an autoguider when piggybacked onto a larger optical tube (automatically calibrating and guiding on stars).

Feature	HX35 (Harmonic Gear)	GX35 (Worm Gear)
Technology	Strain Wave Gear (Harmonic Drive)	Classic Worm Gear
Standard Payload	Up to 22 lbs (No Counterweight required)	Up to 22 lbs (Counterweight included)
Max Payload	Up to 30 lbs (with optional counterweight)	Up to 22 lbs

To ensure a safe, simple, and pleasurable observing experience, please take the time to read through this manual before your first night under the stars. This guide provides detailed information, helpful hints, and important safety considerations to help you master the full operation of your new telescope.

Both telescopes carry a **Two-Year limited warranty** honored by Spectrum Optical Instruments. For details see our website at www.spectrumoi.com. If you have any questions, please feel free to contact our team at Spectrum Optics. We wish you a pleasant exploration!

We hope the HX35/GX35 brings great enjoyment to your astronomical journey!

WARNINGS

SOLAR WARNING

- Solar observations require **SPECIAL PRECAUTIONS** to ensure the safety of both your eyes and your equipment.
- The Sun emits intense and **POTENTIAL HARMFUL RADIATION**, including ultraviolet and infrared light.
- Observing the Sun without proper solar rated gear can lead to **IRREVERSIBLE DAMAGE** to your eyes and equipment.

PART LIST

HX35 / GX35 Mount	x1	MS Intelligent Camera	x1
53mm ED OTA w/ Bracket	x1	Vixen-Style Dovetail	x1
Counterweight (GX only)	x1	Counterweight Shaft (GX only)	x1
AC Adapter	x1	Hex Key(s)	x2
USB-C to USB-C Cable	x2	M5x14mm Hardware Screws	x2
USB-C to 5.5mm Adapter	x1	Mounting Screws (p. scope)	x2
USB-A to USB-A Cable	x1	Polar Scope Bracket	x1
Instruction Manual	x1	Carry Case w/ Keys	x1

OPTIONAL ACCESSORIES

Aluminum Tripod	x1	Counterweight Shaft	x1
Tripod Pier	x1	(included with GX35)	
Polar Scope	x1	Additional Counterweight	x1

MAJOR COMPONENTS

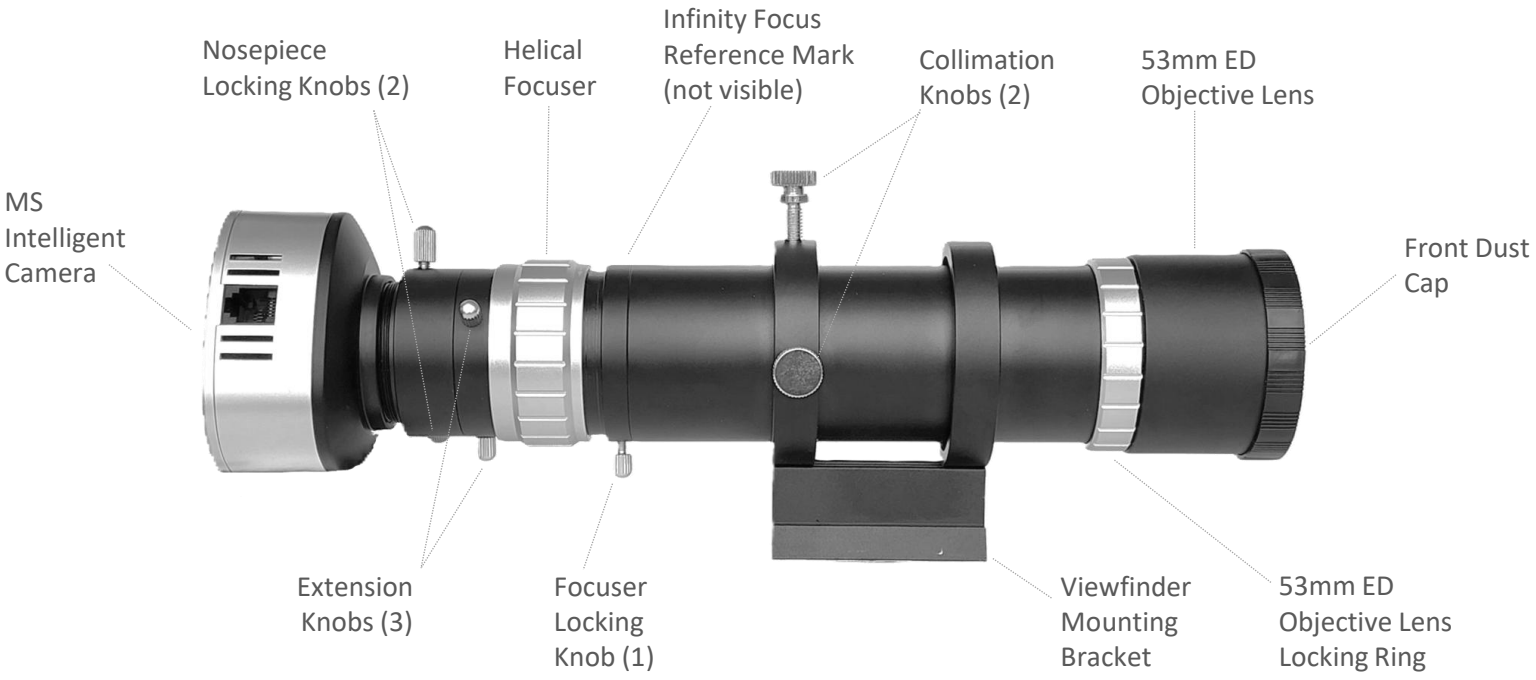

Fig. 1.1

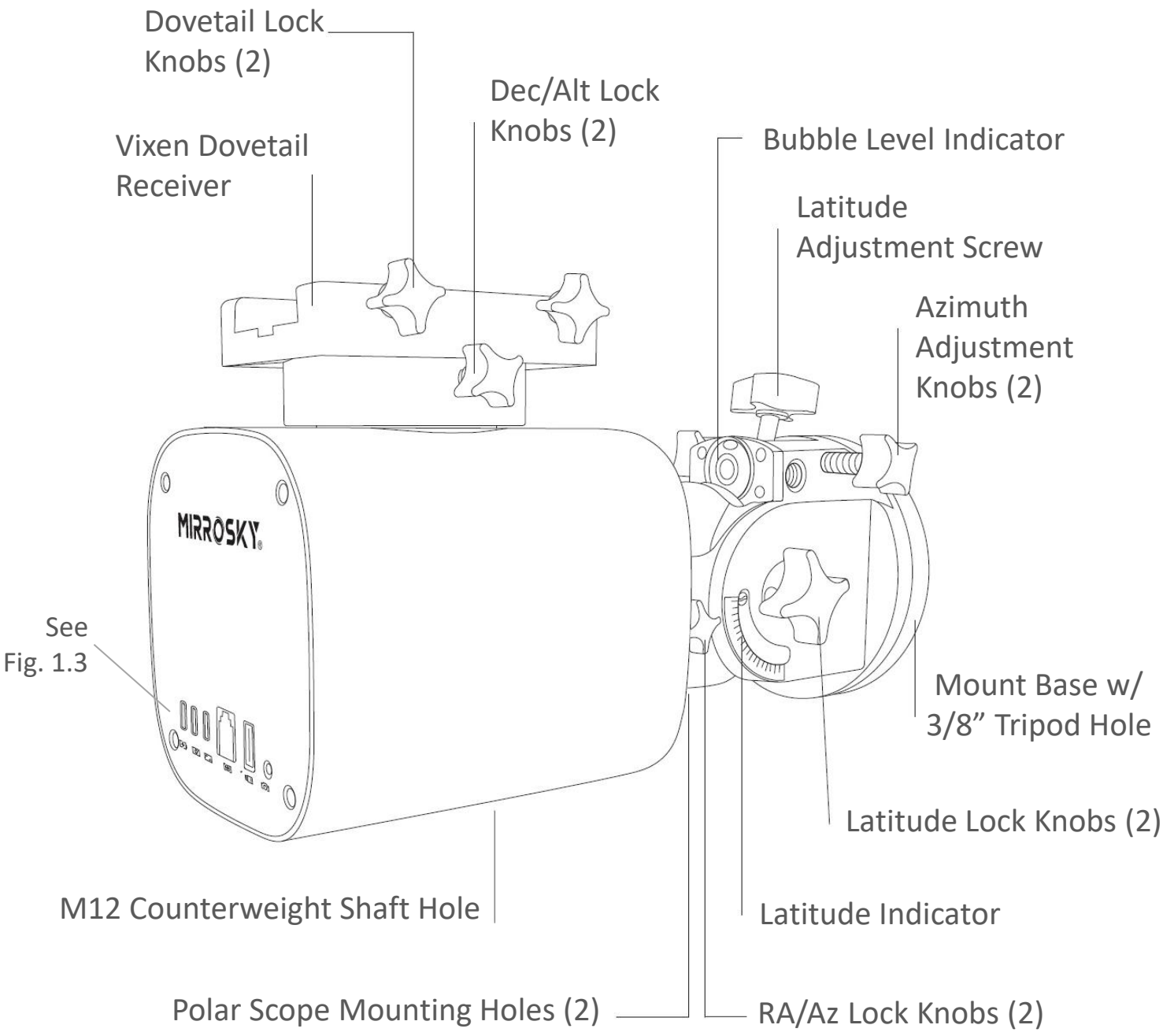

Fig. 1.2

CONTROL PANEL:

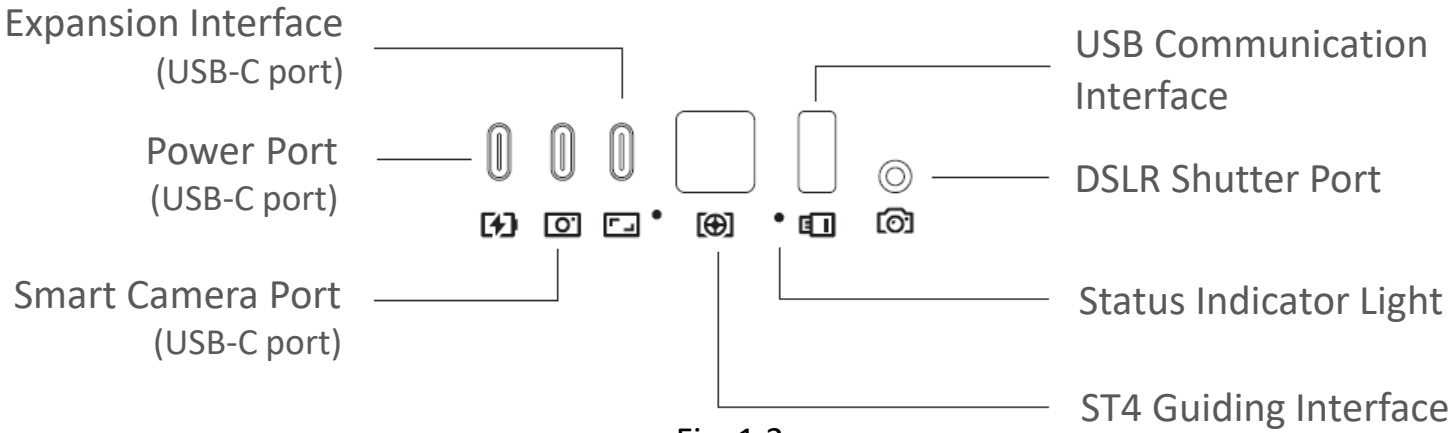

Fig. 1.3

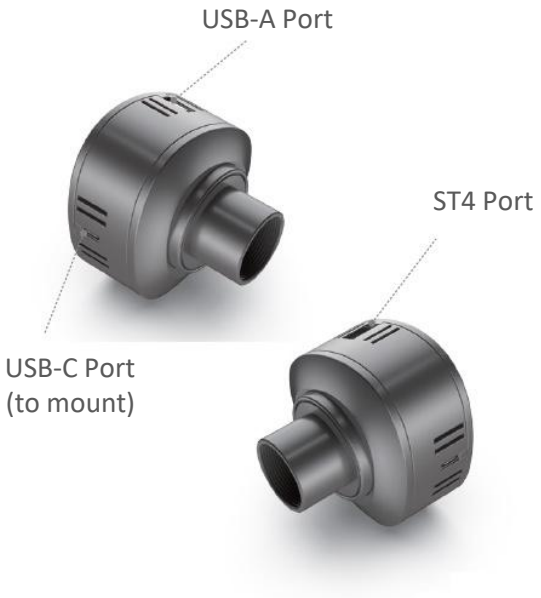

Fig. 1.4

Note: Items shown in Fig. 1.5 comes standard with the GX35 mount and are optional for the HX35. See table on page 2.

Fig. 1.5

EQ CONFIGURATION

*shown with additional counterweight and optional polar scope & tripod. OTA and camera for reference only.

Fig. 1.6

ALT/AZ CONFIGURATION

*shown with OTA, camera and tripod for reference only

Fig. 1.7

Alt-Az Mode

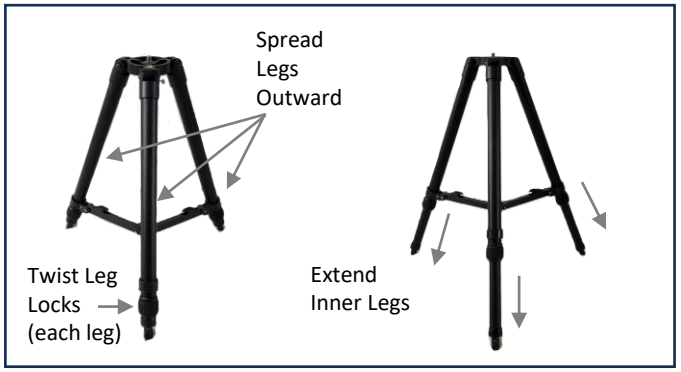

Fig. 2.1

Fig. 2.2

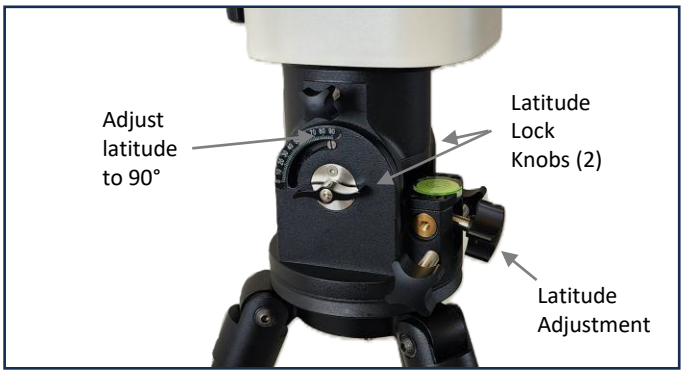

Fig. 2.3

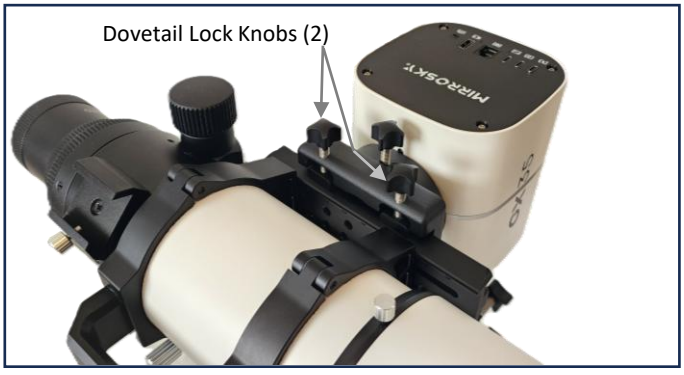

Fig. 2.4

This section details the assembly and initial setup of your HX35 or GX35 mount for Alt/Azimuth (Alt/Az) Mode. This mode is ideal for casual viewing and quick, short duration exposures using the 53mm ED Refractor.

REQUIRED EQUIPMENT

The HX35 and GX35 mounts require a full-size tripod with a 3/8" threaded connection. A compatible tripod is available from Spectrum Optics. The procedures below assume the use of the Spectrum Optics tripod, but the steps are similar for any compatible tripod.

Step 1: TRIPOD AND LOCATION SETUP

1. **Select Location:** Find a safe, flat, and open area with a clear view of the night sky. Choose a spot away from bright lights if possible.

2. **Unfold and Level Tripod:** Unfold the tripod legs and extend them until the top of the tripod appears level. Secure the legs by tightening the leg lock knobs firmly. See Fig. 2.1.

3. **Attach Mount:** Connect the mount to the tripod using the 3/8" threaded connection at the tripod's center. Tighten the connection until it is firm. See Fig. 2.2.

Step 2: CONFIGURE MOUNT FOR ALT/AZ MODE

To prepare the mount for Alt/Az mode, the latitude adjustment must be set to 90 degrees.

1. **Unlock Latitude:** Loosen the mount's two latitude lock knobs.

2. **Set Latitude:** Turn the latitude adjustment screw until the mount's latitude indicator reads 90 degrees. See Fig. 2.3.

3. **Lock Latitude:** Re-tighten the two latitude lock knobs.

4. **Final Leveling:** Use the bubble level included on the mount's base. Adjust the tripod legs (and re-tighten the lock knobs after) until the bubble indicates the mount is perfectly level. ***Accurate leveling is crucial for the mount to track objects correctly.***

Step 3: ATTACHING AND BALANCING THE OTA

A. Attaching the Primary Optical Tube Assembly (OTA)

1. **Attach Primary OTA:** Loosen the two dovetail locking knobs. Slide the primary OTA dovetail plate into the dovetail receiver in the direction indicated. Tighten the dovetail locking knobs to a firm feel. See Fig. 2.4.

Alt-Az Mode Cont'd

Fig. 2.5

Fig. 2.6

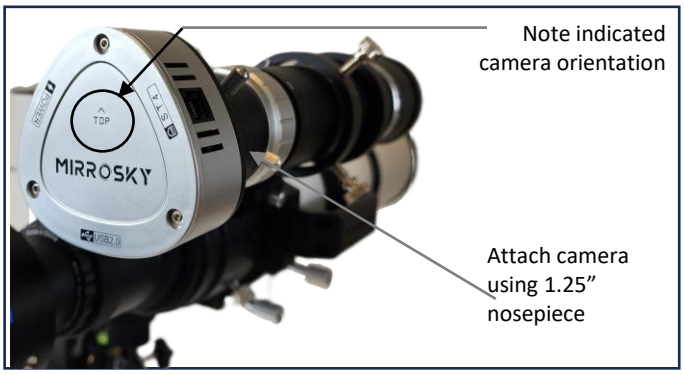

Fig. 2.7

Fig. 2.8

1. **Add Accessories:** Attach all OTA accessories, including diagonals, eyepieces, filters, cameras, dew shields, etc., *before* balancing. See Fig. 2.5.

2. **Lock Axes:** To prevent the OTA from swinging uncontrollably, tighten both the RA/Az and DEC/Alt axis lock knobs to a firm feel.

NOTE on 53mm Refractor Use: The included 53mm ED refractor can be used as your primary OTA. If you choose this, you must swap the existing dovetail on the 53mm bracket for the wider Vixen-style dovetail provided. Use the longer M5 x 14mm (silver) screws for the swap. See page 28 for instruction on swapping the dovetails.

B. ATTACHING THE MIRROSKY GUIDER

If the 53mm ED refractor is being used as a guider or secondary scope:

1. **Attach Guider:** Slide the viewfinder bracket of the 53mm OTA into the viewfinder mounting shoe on the primary OTA, ensuring the lens faces forward. See Fig. 2.6.

2. **Secure Guider:** Tighten the mounting thumbscrews to a firm feel.

3. **Remove Caps:** Remove the front and rear dust caps from the 53mm ED refractor.

C. INSTALLING THE MIRROSKY CAMERA

1. **Install Camera:** Slide the MirroSky Intelligent Camera nosepiece into the rear opening of the 53mm ED refractor. If necessary, loosen the focuser lock knobs.

2. **Orient Camera:** Rotate the camera so the "TOP" label on the rear cover is oriented right-side up. See Fig. 2.7.

3. **Secure Camera:** Tighten the nosepiece locking knobs firmly.

D. BALANCING THE DEC (ALTITUDE) AXIS

DEC axis balance is essential to reduce motor strain.

1. **Prepare to Balance:** While holding the primary OTA securely, loosen both DEC/Alt lock knobs.

2. **Find Imbalance:** Determine which way the OTA wants to rotate. See Fig. 2.8.

Alt-Az Mode Cont'd

Fig. 2.9

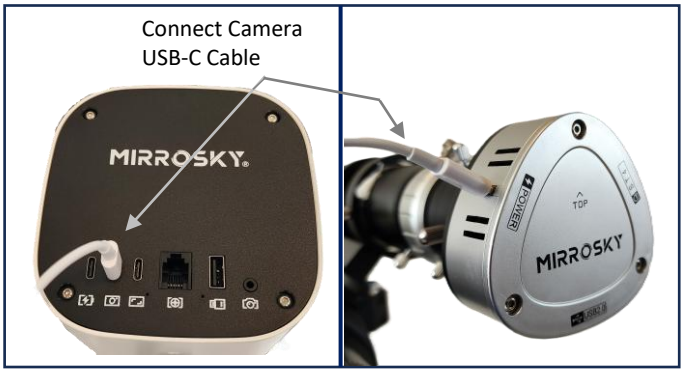

Fig. 2.10

Fig. 2.11

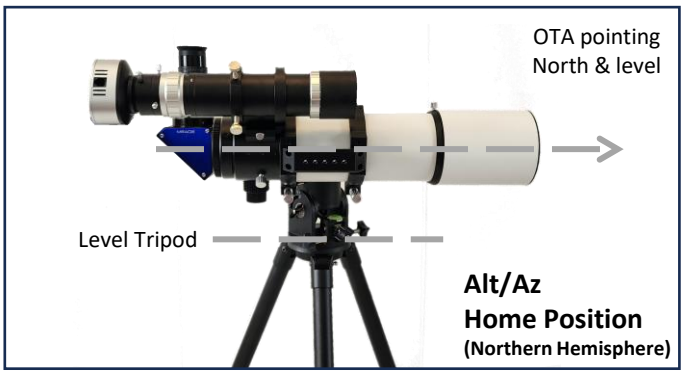

Fig. 2.12

1. **Adjust OTA:** Lock the DEC/Alt clutch again. Slightly loosen the OTA dovetail locking knobs. Carefully slide the OTA forward or backward in the receiver until it remains balanced—it should not drift in either direction when the Dec/Alt clutch is unlocked. See Fig. 2.9.

2. **Lock Position:** Re-tighten the OTA dovetail locking knobs and the DEC/Alt lock knobs firmly.

NOTE on RA Balance: Balancing the RA (Azimuth) axis is generally not required for Alt/Az mode. GX35 users can optionally attach the counterweight shaft and counterweight if a heavy OTA is used.

Step 4: POWER AND HOME POSITION

1. **Connect Camera Cable:** Connect one end of the included USB-C cable to the mount control panel port labeled with the "CAMERA ICON". Connect the other end to the USB-C port on the MirroSky camera. See Fig. 2.10.

2. **Connect Power Cable:** Attach the USB-C tip of the 12v AC adapter into the mount control panel port labeled with the "POWER ICON" . See Fig. 2.11.

3. **Apply Power:** Plug the AC adapter into the electrical outlet.

4. *If using an external, user-supplied power bank, ensure it features Power Delivery (PD) to supply the power required for telescope operation.*

5. **Set Home Position:** Place the mount into the Alt/Az home position and re-lock both axes. (Refer to the HOME POSITION section on page 13 for details.) See Fig. 2.12.

Equatorial Mode

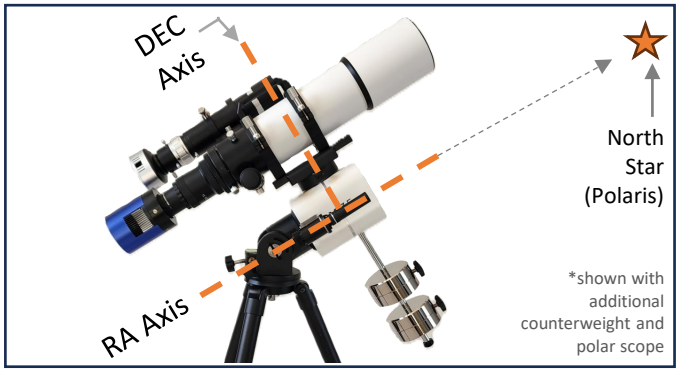

Fig. 2.13

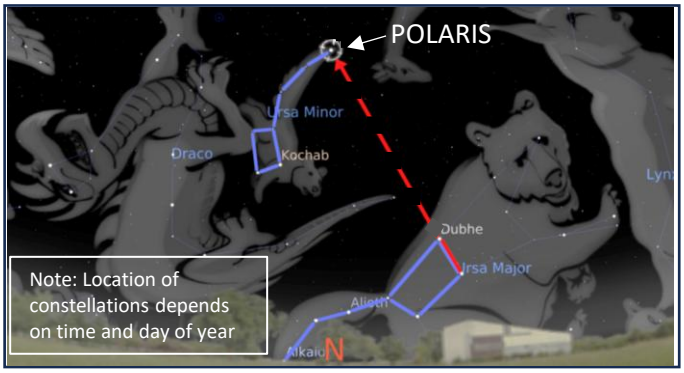

Fig. 2.14

Fig. 2.15

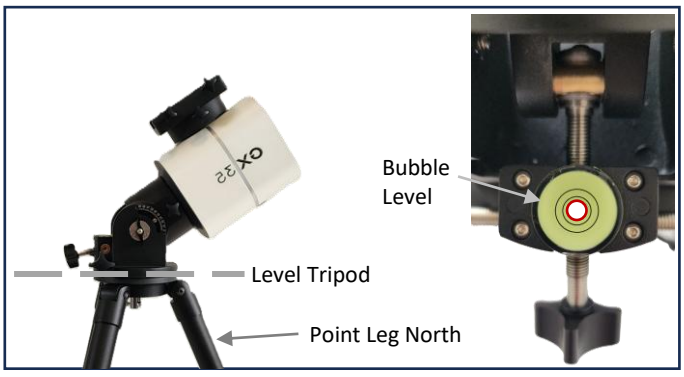

Fig. 2.16

MOUNTING & SETUP FOR GERMAN EQ MODE

This section details the assembly and initial setup of your HX35 or GX35 mount for German Equatorial (EQ) Mode. This mode is ideal for astrophotography because it allows the mount to precisely track and guide on celestial targets, which eliminates field rotation—an unwanted artifact in long-duration alt/azimuth imaging.

REQUIRED EQUIPMENT

The HX35 and GX35 mounts require a full-size tripod with a 3/8" threaded connection. A compatible tripod is available from Spectrum Optics. The procedures below assume the use of the Spectrum Optics tripod, but the steps are similar for any compatible tripod. Optional accessories (pier extension, polar scope, extra counterweights) can also benefit astrophotographers in EQ mode and are available from Spectrum Optics.

Step 1: TRIPOD AND LOCATION SETUP

1. **Select Location:** Find a safe, flat, and open area with a clear view of the sky, especially towards the North Celestial Pole (NCP) or South Celestial Pole (SCP).

2. **Locate Pole:** Use a compass or MirroSky app on your phone to determine the direction of True North (or True South if in the Southern Hemisphere). See Fig. 2.14 or 4.16 on page 24 if in Southern Hemisphere.

3. **Unfold Tripod and Orient Leg:** Unfold the tripod legs and extend them until the top is approximately level. Orient one of the tripod legs to point directly toward North (or South for SCP users). See Fig. 2.16. Secure the legs by tightening the leg lock knobs firmly.

4. **Attach Mount:** Connect the mount to the tripod using the 3/8" threaded connection and tighten it firmly. See Fig. 2.15.

5. **Rotate Mount Body:** For maximum stability, rotate the mount on the tripod so the main body is directly positioned over the Northern tripod leg (or Southern leg). Re-tighten the 3/8” mounting screw.

Step 2: CONFIGURE MOUNT LATITUDE FOR EQ MODE

To prepare the mount for EQ mode, the mount's latitude must be set to match your observing site's latitude.

1. **Unlock Latitude:** Loosen the mount's two latitude lock knobs.

Equatorial Mode Cont'd

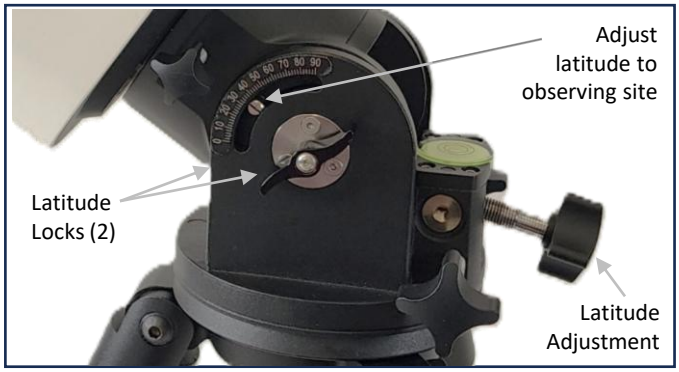

Fig. 2.17

Fig. 2.18

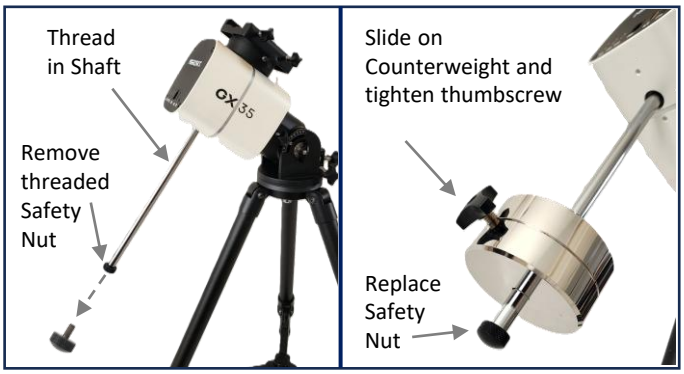

Fig. 2.19

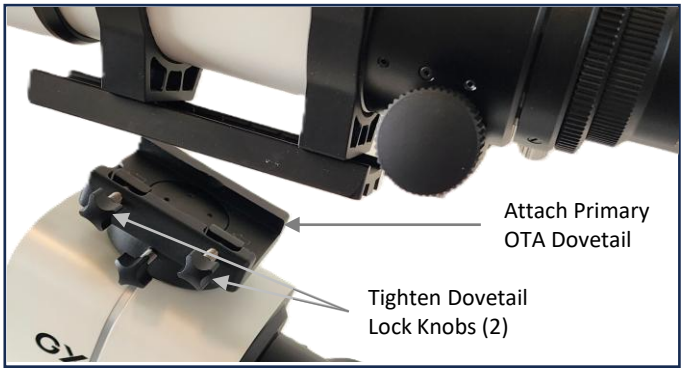

Fig. 2.20

1. **Set Latitude:** Turn the latitude adjustment screw until the mount's latitude indicator matches the latitude of your observing site. See Fig. 2.17.

2. **Lock Latitude:** Re-tighten the two latitude lock knobs.

3. **Final Leveling:** Use the bubble level on the mount's base. Adjust the tripod legs (and re-tighten the lock knobs after) until the bubble indicates the mount is perfectly level. *Accurate leveling will simplify the subsequent polar alignment routine and improve tracking precision.*

Step 3: ATTACH THE COUNTERWEIGHT SYSTEM

This step is required for the GX35 mount and optional for the HX35 mount (when payload exceeds 22 lbs.).

Mount Model	Counterweight Requirement
GX35	REQUIRED to balance the RA axis and reduce motor strain.
HX35	OPTIONAL if payload is less than 22 lbs. REQUIRED if payload is greater than 22 lbs. (up to 30 lbs. max).

1. **Remove Cap:** Unthread the protective cap located on the side of the mount body. See Fig. 2.18.

2. **Attach Shaft:** Thread in the Counterweight Shaft until it is firmly seated. See Fig. 2.19. Remove the Safety Nut and set aside.

3. **Add Counterweight:** Loosen the counterweight thumbscrew and slide the weight onto the shaft. Position it near the end of the shaft and tighten the thumbscrew firmly. See Fig. 2.19.

4. **Attach Safety Nut:** Thread on the Safety Nut. This prevents the counterweight from falling if it comes loose during use. See Fig. 2.19.

Step 4: ATTACHING THE OTAS

A. Attaching the Primary Optical Tube Assembly (OTA)

1. **Attach Primary OTA:** Loosen the two dovetail locking knobs. Slide the primary OTA dovetail plate into the dovetail receiver in the direction indicated. Tighten the dovetail locking knobs to a firm feel. See Fig. 2.20.

Equatorial Mode Cont'd

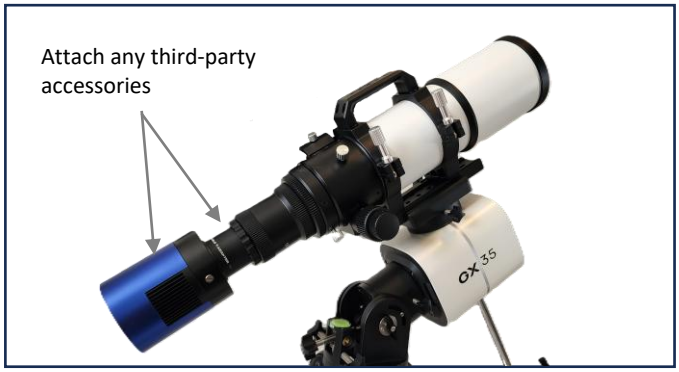

Fig. 2.21

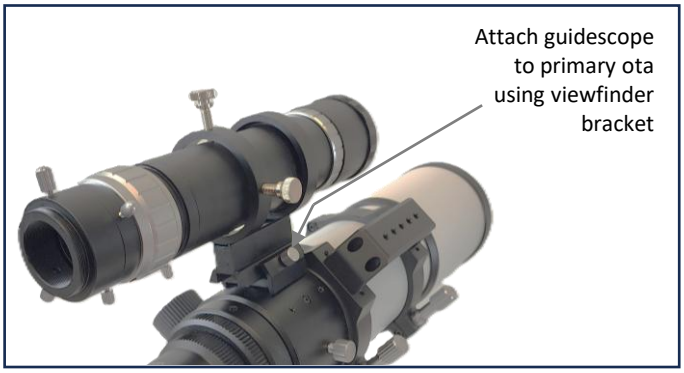

Fig. 2.22

Fig. 2.23

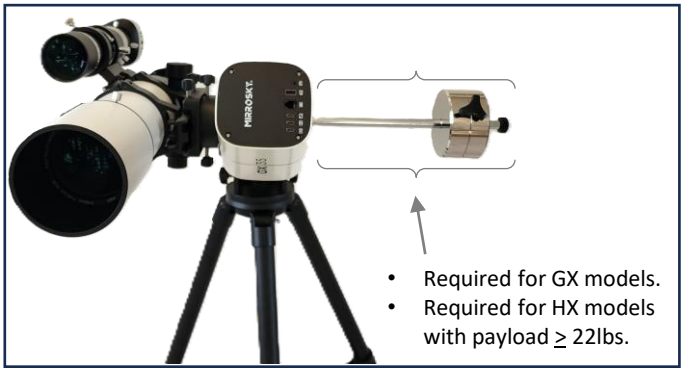

Fig. 2.24

1. **Add Accessories:** Attach all OTA accessories (diagonals, eyepieces, filters, cameras, dew shields, etc.) *before* balancing. See Fig. 2.21.

2. **Lock Axes:** To prevent the OTA from swinging, tighten both the RA and DEC axis lock knobs to a firm feel.

NOTE on 53mm Refractor Use: If the included 53mm ED refractor is your primary OTA, you must swap its existing dovetail for the wider Vixen-style dovetail provided, using the longer M5 x 14mm (silver) screws. See page 28 for the swap procedure.

B. ATTACHING THE MIRROSKY GUIDER

If the 53mm ED refractor is being used as a guider or secondary scope:

1. **Attach Guider:** Slide the viewfinder bracket of the 53mm OTA into the viewfinder mounting shoe on the primary OTA (lens facing forward). See Fig. 2.22.

2. **Secure Guider:** Tighten the mounting thumbscrews firmly.

3. **Remove Caps:** Remove the front and rear dust caps from the 53mm ED refractor.

C. INSTALLING THE MIRROSKY CAMERA

1. **Install Camera:** Slide the MirroSky Intelligent Camera nosepiece into the rear opening of the 53mm ED refractor. If necessary, loosen the focuser lock knobs.

2. **Orient Camera:** Rotate the camera so the "TOP" label on the rear cover is oriented right-side up. See Fig. 2.23.

3. **Secure Camera:** Tighten the nosepiece locking knobs firmly.

Step 5: BALANCING THE RA AND DEC AXES

Balancing is critical for both the HX35 & GX35 mount to reduce motor strain and maximize tracking performance. **NOTE:** The HX35 RA drive is a Strain-Wave drive that does not require balance unless it exceeds a payload of 22lbs.

A. BALANCING THE RA (RIGHT ASCENSION) AXIS

- **GX35 Users Only:** The RA axis must be balanced.

- **HX35 Users Only:** If using the optional counterweight system (payload ≥ 22 lbs.), follow the instructions included with that system.

Equatorial Mode Cont'd

Fig. 2.25

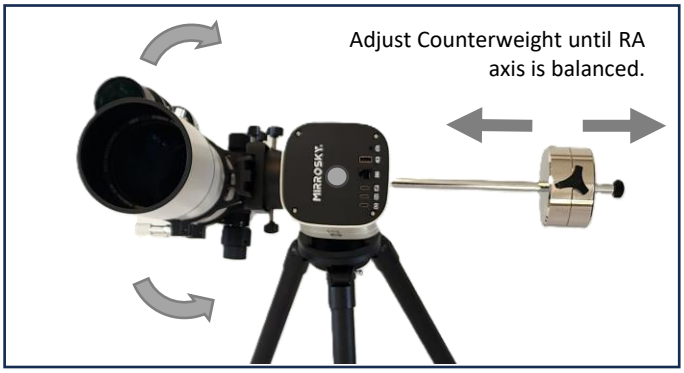

Fig. 2.26

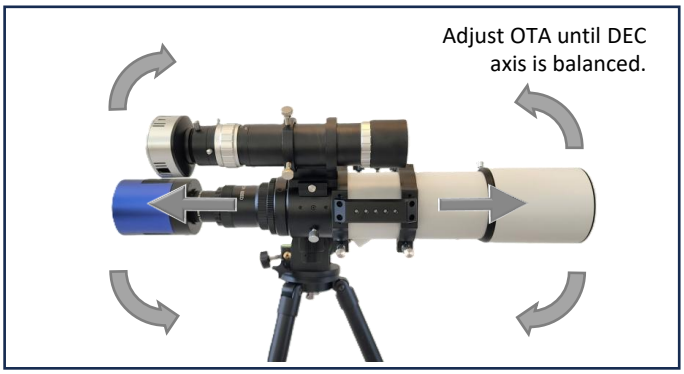

Fig. 2.27

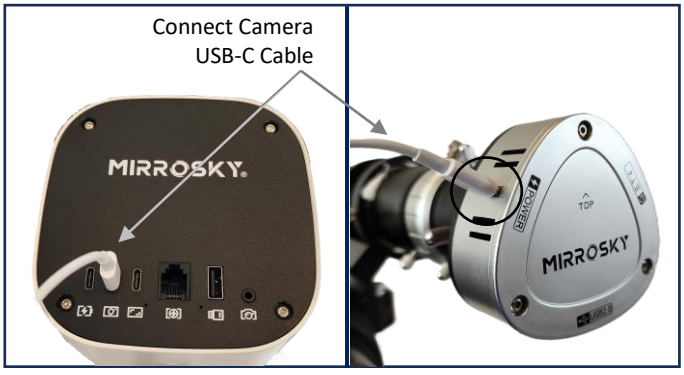

Fig. 2.28

GX35 BALANCING PROCEDURE:

Unlock RA Axis: Loosen the mount's two RA lock knobs.

1. **Adjust Position:** While securely holding the counterweight shaft, rotate the RA axis until the counterweight shaft is parallel to the ground. See Fig. 2.24.

2. **Find Imbalance:** Determine which way the RA axis wants to rotate. See Fig. 2.26.
    1. If the counterweight side is heavier: Slide the weight toward the OTA.
    2. If the OTA side is heavier: Slide the counterweight away from the OTA. If the weight is against the Safety Nut, an additional counterweight(s) is needed.

3. **Lock Position:** Re-tighten the counterweight thumbscrew firmly. Relock the RA axis if needed.

B. BALANCING THE DEC (DECLINATION) AXIS

This balance procedure is required for both HX35 and GX35 mounts.

1. **Adjust Mount Position:** Unlock the RA axis and rotate it so the counterweight shaft is parallel to the ground. Relock the RA axis firmly. See Fig. 2.24 & 2.27.

2. **Prepare to Balance:** While holding the primary OTA securely, loosen both DEC lock knobs.

3. **Find Imbalance:** Determine which way the OTA wants to rotate around the Dec axis. See Fig. 2.27. Then relock the dec axis.

4. **Adjust OTA:** Slightly loosen the OTA dovetail locking knob. Carefully slide the OTA forward or backward in the receiver until it remains balanced (it should not drift in either direction). If your ota uses tube rings, you can slide the ota within the tube rings instead.

5. **Lock Position:** Re-tighten the OTA dovetail locking knobs (or tube rings) and the DEC lock knobs firmly.

Step 6: POWER AND HOME POSITION

1. **Connect Camera Cable:** Connect the included USB-C cable from the mount control panel port labeled "CAMERA ICON" to the USB-C port on the MirroSky camera. See Fig. 2.28.

2. **Connect Power Cable:** Attach the USB-C tip of the 12v AC adapter into the mount control panel port labeled "POWER ICON". See Fig. 2.29.

Home Position

Fig. 2.29

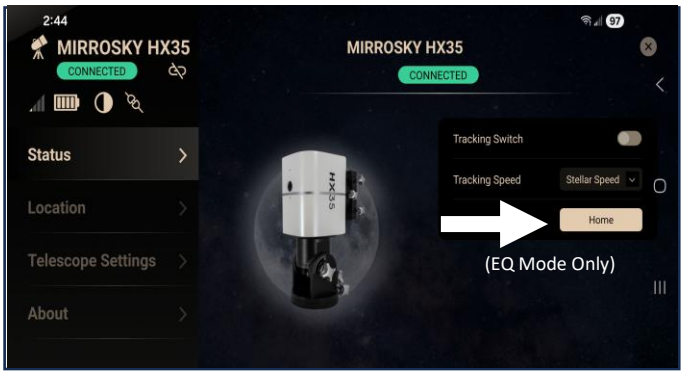

Fig. 2.30

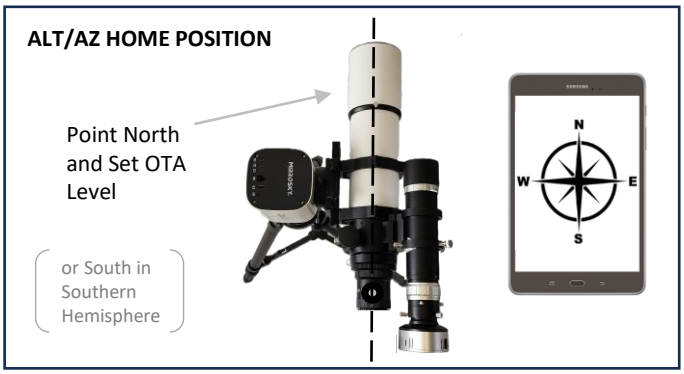

Fig. 2.31

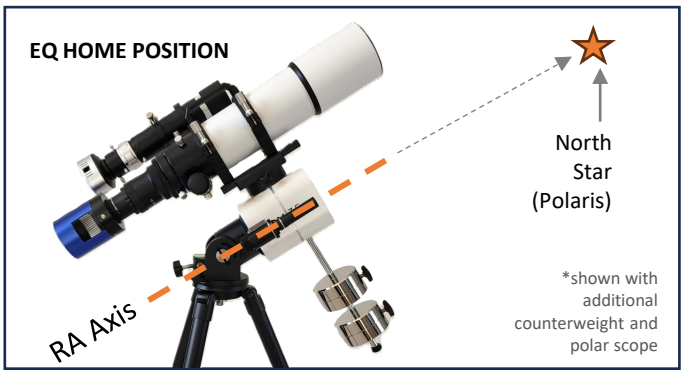

Fig. 2.32

3. **Apply Power:** Plug the AC adapter into the electrical outlet.

If using an external, user-supplied power bank, ensure it features Power Delivery (PD) to supply the power required for telescope operation.

1. **Set Home Position:** Place the mount into the EQ home position and re-lock both axes. See the below section and Fig. 2.32.

ALT/AZ AND EQ HOME POSITION

The Home Position is the standardized starting orientation for your telescope. Beginning from this position allows the MirroSky Intelligent Camera System to quickly and efficiently locate the first celestial object using its plate-solving technology. See Fig. 2.31 and 2.32

You have two methods for moving the telescope to the Home Position:

1. **Manual Adjustment:** Loosen the RA and DEC clutches and physically move the mount into the defined position.
   Note: The HX35 harmonic drive has no RA clutch and must be moved electronically.

2. **Electronic Slew:** In the MirroSky app, use the movement keys or the dedicated HOME button (EQ mode only) within the MirroSky app to electronically slew the telescope. See Fig. 2.30.

DEFINED HOME POSITIONS

The Home Position varies based on the operational mode you have selected:

Mode	Home Position Description
Alt/Azimuth (Alt/Az)	The Optical Tube Assembly (OTA) tube is level (parallel to the ground) and pointing directly toward True North (or True South in the Southern Hemisphere).
German Equatorial (EQ)	The OTA is positioned directly over the mount, facing forward and pointing toward True North (or True South). The counterweight shaft must be at its lowest position (pointing straight down).

Home Position Cont'd

Fig. 2.33

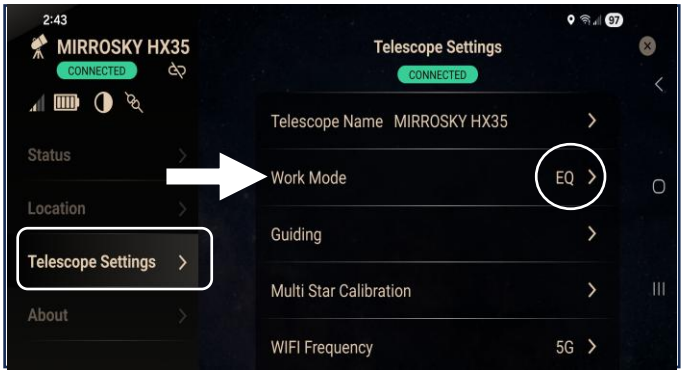

Fig. 2.34

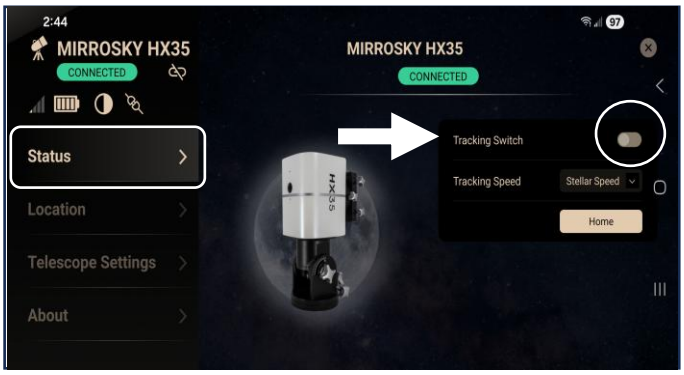

Fig. 2.35

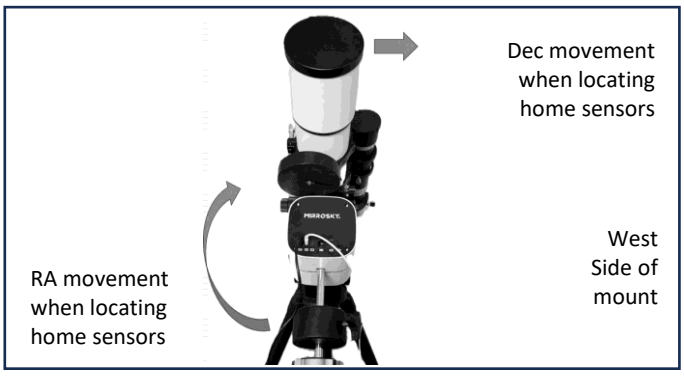

Fig. 2.36

USING THE MIRROSKY APP TO FIND EQ HOME POSITION (ELECTRONIC SLEW)

The MirroSky app can automatically move the mount to the EQ Home Position (EQ Mode Only).

1. **Open Settings:** In the app, navigate to the Telescope Settings (usually found via the telescope icon in the upper left corner). See Fig. 2.33.

2. **Verify Mode:** Confirm that the "Work Mode" is set to EQ. See Fig. 2.34.

3. **Disable Tracking:** Go to the Status tab and deselect (turn off) the Tracking Switch setting. See Fig. 2.35.

4. **Initiate Home Slew:** Select the HOME button. When prompted, confirm the movement by selecting Yes.

5. **Telescope Movement:** The telescope will automatically rotate in RA and DEC until it reaches the EQ Home Position.

CAUTION: Electronic Slew Safety

The mount may rotate a full 360 degrees in one or both axes when moving to the Home Position. Stay alert before using this feature and ensure there is:

- Sufficient slack in all cables to prevent snags or damage (cord wrap).
- No physical interference between the OTA and the tripod legs.

Always carefully monitor the telescope's movement and stop the process immediately if interference is observed.

HOME POSITION SENSORS

The HX35 and GX35 mounts can use integrated electronic sensors to automatically locate the Home Position when in Equatorial (EQ) mode. Refer to Fig. 2.36 which shows the direction each axis will rotate to locate the home position.

Safety Precautions

When initiating the automatic homing routine, please monitor the following:

- **Extended Rotation:** If the OTA starts on the West side, the mount may rotate nearly 360° to find the sensor.
- **Cable Management:** Watch for potential cable wrap or snags during this rotation.
- **Clearance:** Ensure the OTA has a clear path to move without hitting the tripod or other obstructions.

Focusing the OTAS

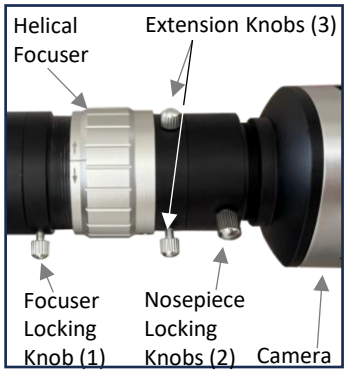

Fig. 2.37

Fig. 2.38

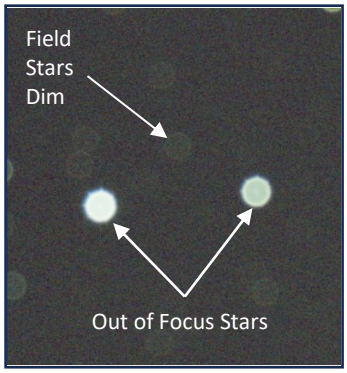

Fig. 2.39

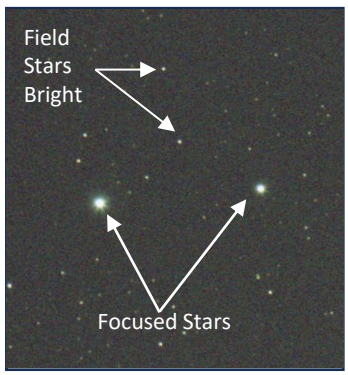

Fig. 2.40

FOCUSING THE OTA

Accurate focus is essential for clear visual observation and sharp astrophotography. This section details how to achieve focus for both the 53mm ED OTA and your primary Optical Tube Assembly (OTA).

Part 1: Focusing the 53mm ED OTA

The included 53mm ED OTA features a helical focuser with approximately 16mm of travel. See Fig. 2.37.

A. Initial Focus Setup

1. **Unlock Focuser:** Loosen the focuser locking knob located in front of the helical focuser.

2. **Daytime Use:**
   - **Near Objects:** Rotate the silver focuser ring **counterclockwise** (viewed from the back of the telescope) to focus on nearby objects.
   - **Distant Objects:** Rotate the silver focuser ring **clockwise** to focus on distant objects.

3. **Night Sky (Infinity) Focus Approximation:**
   - To quickly get close to infinity focus, rotate the focuser until the etched line and the edge of the focuser ring are aligned with no gap between them. See Fig. 2.38.

B. FINE-TUNING FOCUS (VISUAL/INITIAL)

1. **Align OTAs:** Ensure the 53mm OTA is aligned with the primary OTA (see Aligning the OTAs section).

2. **Select Target:** Point the telescope at a very bright star high in the sky (greater than 40 degrees altitude).

3. **Adjust Focuser:** Adjust the 53mm focuser ring while observing the star in the MirroSky app.

   1. **Out-of-Focus:** Stars will appear large, blurry, and dim. See Fig. 2.39.

   2. **In-Focus:** Continue adjusting until the brightest stars appear as small, sharp, and as bright as possible. As focus improves, fainter field stars will also become visible. See Fig. 2.40.

4. **Secure Focus:** Once achieved, re-tighten the focuser locking knob securely.

Focusing the OTAS Cont'd

Fig. 2.41

Fig. 2.42

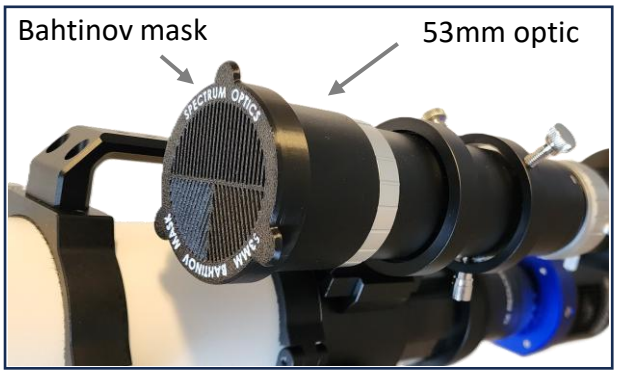

Fig. 2.43

Bright star pattern created with the Bahtinov focusing mask installed

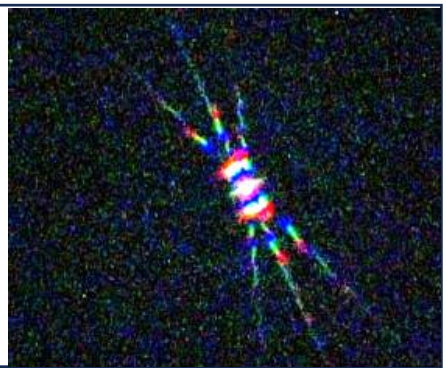

Fig. 2.44

[Bahtinov Mask Instructions]

Part 2: FOCUSING THE PRIMARY OTA

Focusing the primary OTA ensures the best visual or imaging results for your main target.

1. **Install Eyepiece or Camera:** If possible, start with a 90-degree diagonal and low-power eyepiece installed, as this provides a wider field of view and a brighter image, simplifying the process. After focusing with an eyepiece, switch to the camera (if imaging). See Fig. 2.41 and 2.42.

2. **Select Target:** Point the telescope at a bright object, such as the Moon, a bright star, or a distant terrestrial object.

3. **Adjust Focus Knob:** Turn the primary OTA's focus knob until the image appears sharp. When near focus, turn the knob slowly until the image is sharp and stars are as small and bright as possible.

NOTE: Focus may shift throughout the night due to changes in ambient temperature or when changing eyepieces. Refocus all otas as needed.

Part 3: USING THE BAHTINOV FOCUSING MASK (FOR CAMERA USE)

The included Bahtinov mask is used only when focusing the camera through the 53mm optic and provides the most precise focus for astrophotography. Dark frames are not needed for this process. See Dark Frames on page 26.

1. **Initial Setup:** Point the telescope at a very bright star high in the sky. Set the camera exposure to approximately 2–3 seconds and the gain to around 100.

2. **Attach Mask:** Place the Bahtinov mask over the front of the 53mm optic. See Fig. 2.43. The mask creates a distinct diffraction pattern consisting of an "X" with a central line (or spike).

3. **Adjust and Align:** Adjust the 53mm focuser until the central line perfectly bisects (passes through the middle of) the "X" pattern. If possible, zoom in using the MirroSky app for precise alignment. See Fig. 2.44.

4. **Remove Mask:** Once the alignment is perfect, remove the Bahtinov mask from the optic before imaging or observing.

For detailed instructions on using the Bahtinov Focusing Mask, scan the QR code or click the hyperlink to the left.

Aligning the OTAS

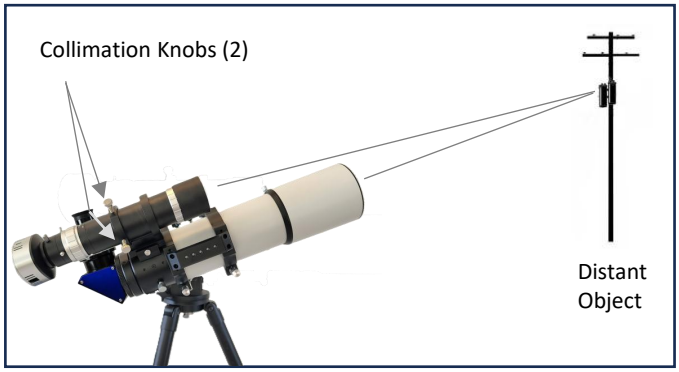

Fig. 2.45

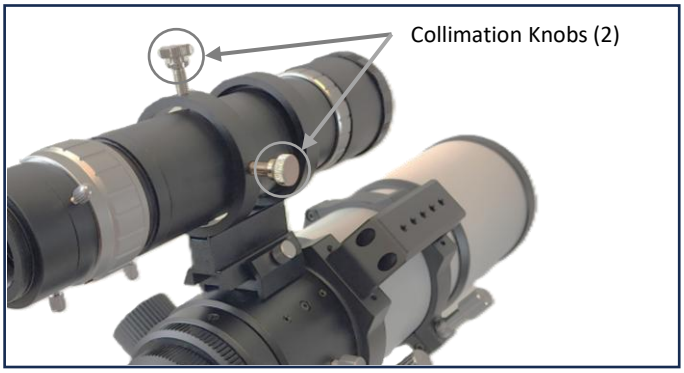

Fig. 2.46

SOLAR WARNING

- Solar observations require **SPECIAL PRECAUTIONS** to ensure the safety of both your eyes and your equipment.
- The Sun emits intense and **POTENTIAL HARMFUL RADIATION**, including ultraviolet and infrared light.
- Observing the Sun without proper solar rated gear can lead to **IRREVERSIBLE DAMAGE** to your eyes and equipment.

ALIGNING THE OTAS

Before proceeding, please ensure you have completed the initial setup:

- **Download the MirroSky App.**
- **Connect to the telescope.**
- **Know how to move the telescope using the app.**

Refer to the sections titled "Getting Ready" and "How to Use the HX/GX: Terrestrial Viewing" on pages 18-20 before starting this alignment.

For optimal performance, both the primary Optical Tube Assembly (OTA) and the 53mm Guiding/Secondary OTA must be precisely pointed at the exact same location. This is achieved by aligning the 53mm OTA using the guider bracket collimation knobs. See Fig. 2.46.

PROCEDURE FOR OTA ALIGNMENT

1. **Select a Target:** During the daytime, point the primary OTA at a stationary, distant object, such as a streetlamp, utility pole, or a radio tower. See Fig. 2.45.

2. **Center and Focus Primary OTA:** Focus the primary OTA and center the chosen object precisely in its field of view.

3. **Focus 53mm OTA:** Focus the 53mm optic until the distant object appears sharp. If needed, refer to page 15 for focusing instructions.

4. **Align the 53mm OTA:** Without moving the primary OTA, adjust the position of the 53mm OTA solely by using the 2 guider bracket collimation knobs. See Fig. 2.46. Continue adjusting until the same distant object is perfectly centered in the 53mm OTA's field of view.

Once this procedure is complete, both optical tubes are aligned. Any object viewed in one telescope will now appear in the other.

NOTE: If necessary, a more precise, fine-tuned alignment can be performed at night using a bright star, planet, or the Moon.

The MirroSky App

Android App Download

Apple App Download

App Logo

Fig. 3.1

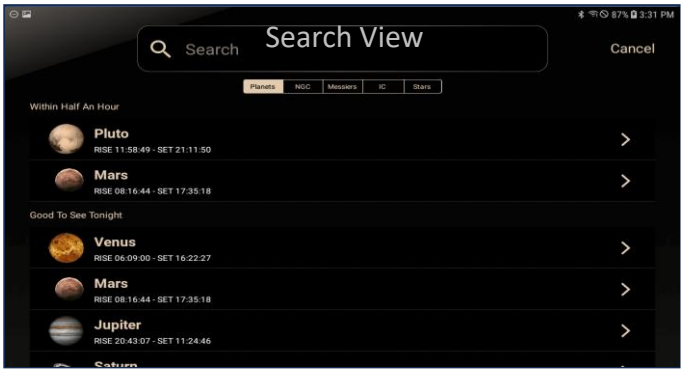

Fig. 3.2

Fig. 3.3

Fig. 3.4

Follow these steps to prepare your system for its first session.

1. DOWNLOAD THE MIRROSKY APP

To control your telescope, you will need the MirroSky App.

- **QR Code:** Scan the QR code (Fig. 3.1) to go directly to the download page.
- **App Store:** Alternatively, search for “MirroSky” in the Apple App Store or Google Play Store.

2. CONFIGURE APP PERMISSIONS

When you launch the app for the first time, you will be prompted to grant specific permissions. These are essential for the telescope's smart features:

- **Photo Album Access:** Required to save the images and live stacks captured by the MirroSky camera directly to your device.
- **Location Services (GPS):** The HX35 & GX35 system relies on your phone’s GPS data, date, and time to accurately align the telescope with the night sky.
- **Network Prompt:** If your device asks how to handle the Wi-Fi connection, select "Always connect without internet" to maintain a stable link between your smart device and the mount.

3. POWERING THE MOUNT

The mount requires a stable power source to operate the precision motors and the Intelligent Camera System.

- **AC Power:** Plug the included 12V AC adapter into a standard outlet and connect the USB-C tip to the power port on the mount control panel. As the mount has no dedicated power switch, applying power to the mount will power on the mount. See Fig. 3.4.

Note: If the mount needs to be powered down quickly, please pull the power cable from the mount to halt any telescope slew immediately.

- **Portable Power:** For field use, you may use a portable power bank. Ensure the power bank is capable of supplying 12VDC/3A and features Power Delivery (PD) technology for consistent performance.

Connecting to the Telescope

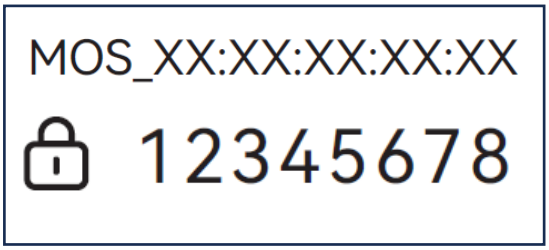

Fig. 3.5

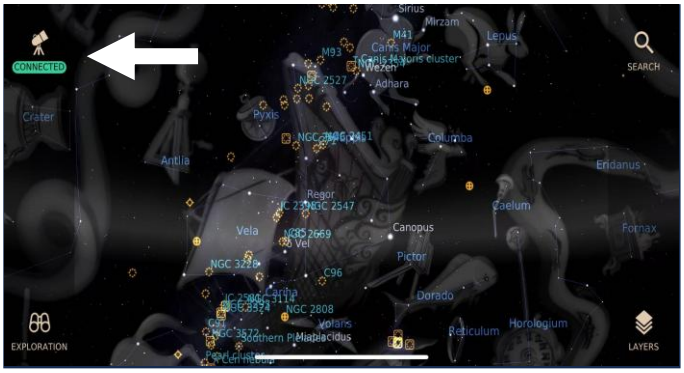

Fig. 3.6

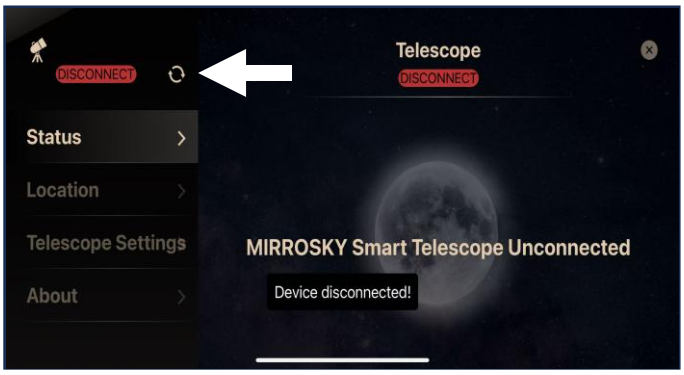

Fig. 3.7

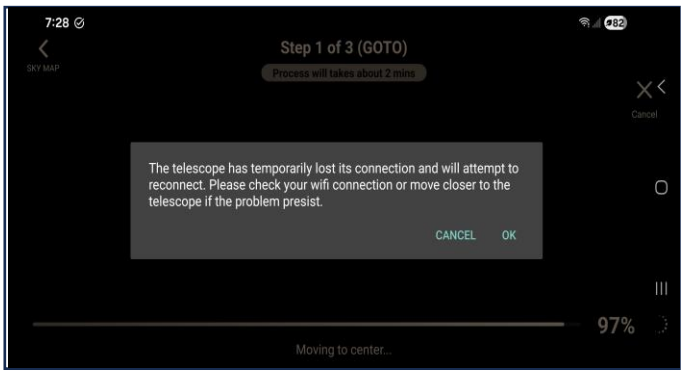

Fig. 3.8

CONNECTING TO THE TELESCOPE

Once the mount is powered and the app is installed, follow these steps to link your mobile device to the telescope's internal hotspot network.

1. ESTABLISH THE WI-FI CONNECTION

The telescope generates its own Wi-Fi hotspot to allow direct communication without the need for an external router.

- **Locate Network:** Open the Wi-Fi settings on your phone or tablet.
- **Select Network:** Choose the network named **"MOS_XXXXXXXX".** See Fig. 3.5.
- **Enter Password:** When prompted, enter the default password: **12345678**. See Fig. 3.5.

2. VERIFY CONNECTION STATUS

- **Launch the App:** Open the MirroSky app on your device.
- **Check Indicator:** Look at the upper-left corner of the Home Page. A green icon stating "CONNECTED" confirms the link is active. See Fig. 3.6.

3. TROUBLESHOOTING DISCONNECTIONS

If the status changes to a red "DISCONNECTED" message (Fig. 3.7), use the following steps to restore the link:

- **Manual Reconnect:** Tap the Telescope Icon or the Refresh Icon located next to it. The app will attempt to re-establish the handshake with the mount.
- **Check Lock Screen Settings:** Mobile devices often cut Wi-Fi data when the screen locks to save power. If you experience frequent disconnections, increase your device's "Auto-Lock" or "Screen Timeout" duration.
- **Range & Interference:** Ensure you are standing within a reasonable distance of the telescope (typically within 15–30 feet) and that there are no major obstructions blocking the Wi-Fi signal.

Terrestrial Viewing

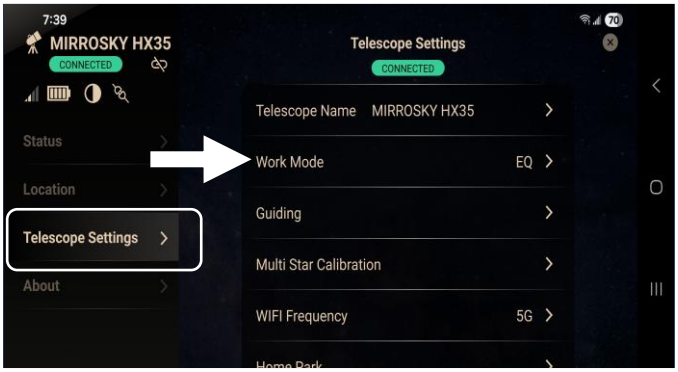

Fig. 4.1

Fig. 4.2

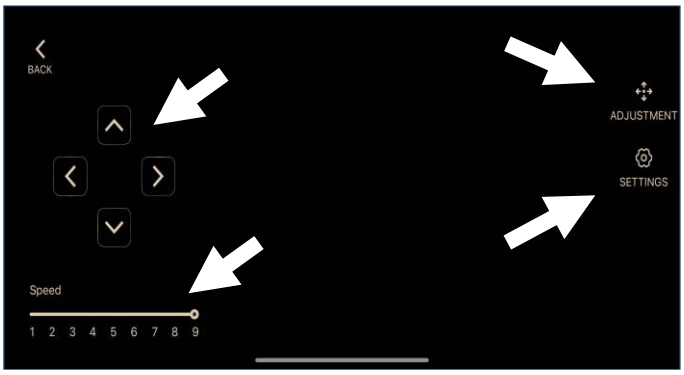

Fig. 4.3

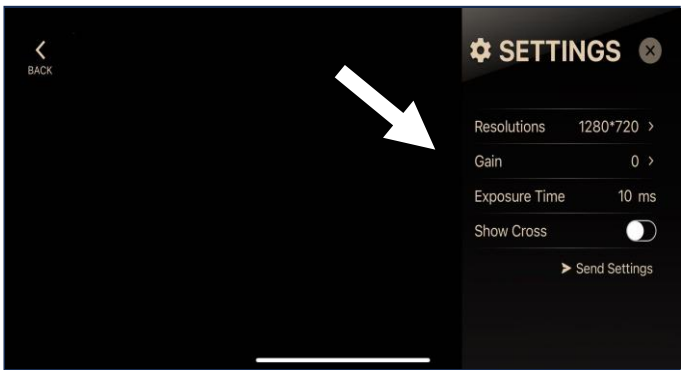

Fig. 4.4

HOW TO USE THE HX35 OR GX35

Once your hardware is assembled, the MirroSky app acts as the command center for your HX35 or GX35 system.

SELECTING YOUR WORK MODE

Before observing, you must ensure the app is configured to match your physical telescope setup.

1. Open the Telescope Settings window in the app.

2. Locate the Work Mode selection. See Fig. 4.1.

3. **Select AZ Mode:** If your mount is configured in an Altitude/Azimuth (Alt/Az) orientation.

4. **Select EQ Mode:** If your mount is configured in an Equatorial orientation. Follow the steps on page 24 for more information about using the telescope in EQ mode.

TERRESTRIAL VIEWING & EXPLORATION

The HX35 and GX35 series are highly capable of daytime terrestrial observation. Follow these steps to begin exploring:

1. **Enter Exploration Mode:** Tap the EXPLORATION button located at the bottom left of the main screen. See Fig. 4.2.

2. **Adjust Slewing (Movement):** Tap the ADJUSTMENT button to open the movement controls. See Fig. 4.3.

    - **Direction:** Use the directional arrows on the left of the screen to move the telescope.

    - **Speed:** Use the speed bar to change how fast the telescope moves. Settings range from 1 (slowest/finest control) to 9 (fastest/slew speed).

3. **Configure Camera Settings:** Tap the SETTINGS button within the Exploration page (Fig. 4.4) to fine-tune your image. Here you can adjust:

    - **Resolution:** Choose the image quality.

    - **Gain & Exposure Time:** Adjust light sensitivity based on lighting conditions.

    - **Crosshair Overlay:** Enable this to help center distant objects accurately.

Celestial Viewing / Imaging

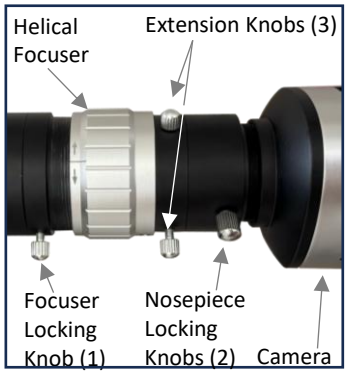

Fig. 4.5

Fig. 4.6

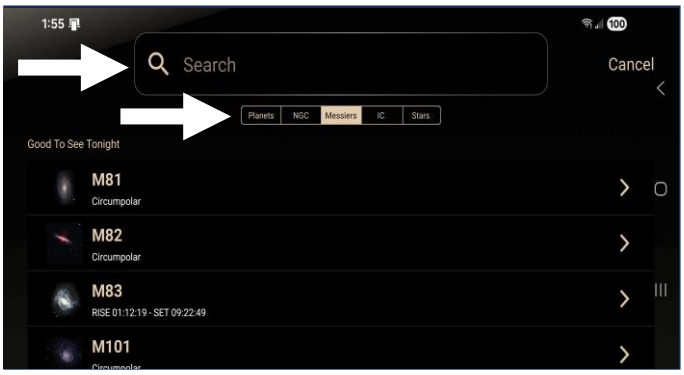

Fig. 4.7

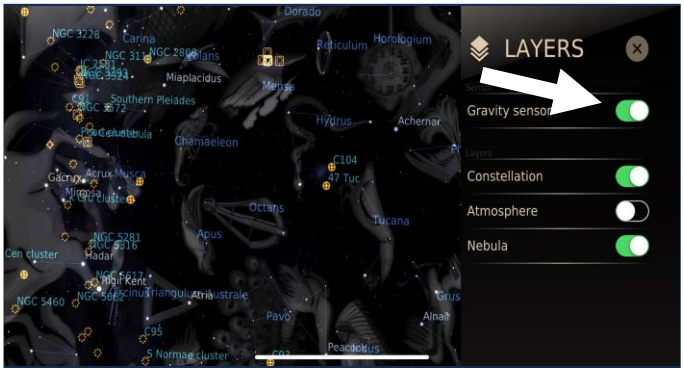

Fig. 4.8

ACHIEVING SHARP FOCUS

After you have used the app to center your target, you must manually focus the optics:

- **Adjusting Focus:** Rotate the silver focuser ring on the OTA until the image appears sharp and clear. See Fig. 4.5 for the different parts of the focuser.

- **Optimal Result:** For terrestrial targets, focus until fine details are crisp; for astronomical targets, focus until stars appear as small and bright as possible.

For a deep dive into advanced focusing techniques and infinity focus marks, please refer to "Focusing the OTA" on page 15.

CELESTIAL VIEWING AND IMAGING

The MirroSky app offers two intuitive ways to find targets in the deep sky. Once a target is selected, your telescope mount will automatically locate, center, and start tracking the object.

SELECTING YOUR TARGET

Method 1: Name Search (Best for specific targets)

1. Tap the Search icon in the top-right corner of the Sky Map. See Fig. 4.6.

2. Enter the name or catalog number (e.g., M42, NGC 7000, or IC 434) into the search bar. See Fig. 4.7.

3. Alternatively, browse the categorized object list below the search bar and select your desired target.

Method 2: Interactive Sky Map (Best for exploration)

1. Tap the Layers icon at the bottom-right of the Sky Map. See Fig. 4.6.

2. Enable the Gravity Sensor (Fig. 4.8); this allows the app to show you exactly what is in the sky as you move your phone or tablet. If the Gravity Sensor is disabled, you can pan around the map and locate targets to image as well.

3. Customize your view by toggling "Constellation," "Atmosphere," or "Nebula" overlays.

4. Zoom in on the map and tap any object to select it.

Plate Solving & Imaging

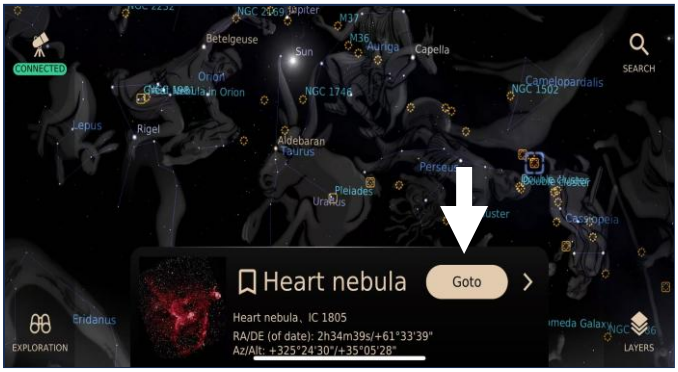

Fig. 4.9

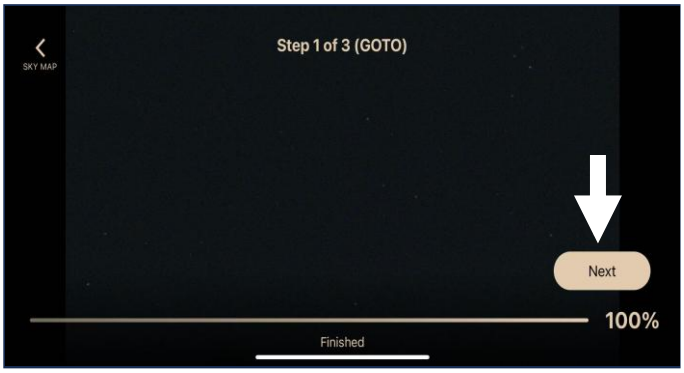

Fig. 4.10

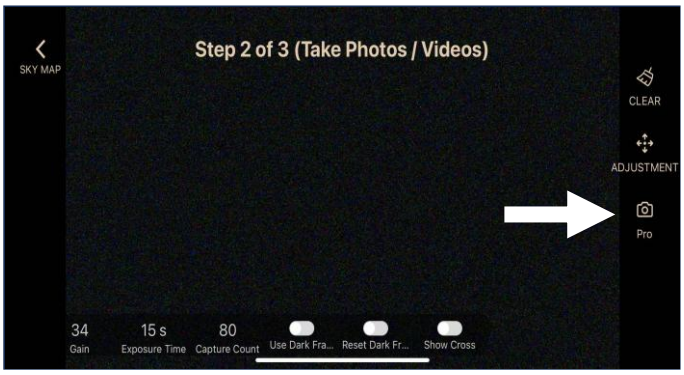

Fig. 4.11

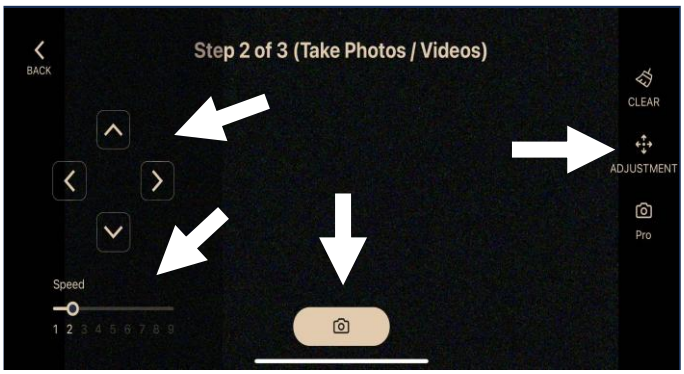

Fig. 4.12

AUTOMATED "GOTO" AND PLATE SOLVING

Once an object is selected, its coordinates and a GoTo icon will appear at the bottom of the screen. See Fig. 4.9.

1. **Initiate GoTo:** Tap GoTo. The telescope will begin moving.

2. **Plate Solving:** The system will automatically take a photo of the stars and "Plate Solve" to determine its exact position.

   Note: The telescope may slew to a clear part of the sky first to calibrate before moving to your final target.

3. **Centering:** The process usually takes about 2-3 minutes. If the view is obstructed (e.g., by a tree or building) and the solve fails, simply tap GoTo again once the view is clear.

4. **Confirm:** When the object is centered, tap the Next icon in the bottom-right corner. See Fig. 4.10.

5. **Reframing:** If you wish to frame your target differently, or the centering is not exact, use the manual telescope controls to adjust the telescope position. See Fig. 4.12.

IMAGING AND LIVE STACKING

Before capturing your image, you can fine-tune your results in the Pro Settings menu. See Fig. 4.11.

1. **Configure Settings:** Select the Pro icon to adjust:
   - **Exposure Time:** The duration of each individual frame.
   - **Gain:** The sensor's light sensitivity.
   - **Image Count:** How many frames will be "stacked" together.

2. **Recommended Starting Point:**
   - **Exposure:** 10 seconds (10,000ms)
   - **Gain:** 34
   - **Count:** 80 images
   - ***Tip:*** *Aim for the longest exposure possible without causing "star trailing" or image saturation. Often 15 second exposure is achievable.*

Plate Solving & Imaging Cont'd

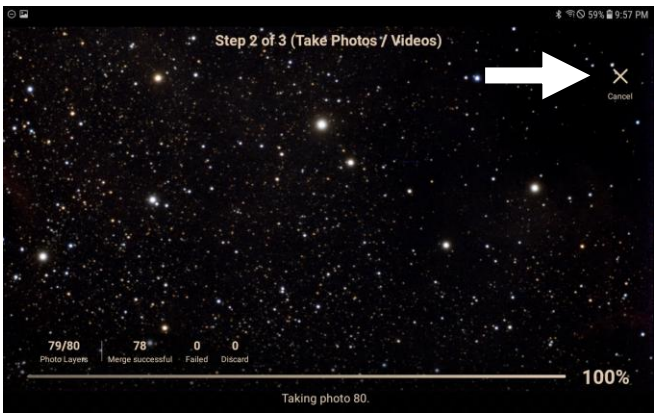

Fig. 4.13

Live Stacking: Press the Camera icon to begin. The app will automatically "stack" the images in real-time.

You will typically see details start to emerge after about 4 images. The image will become progressively brighter and clearer as more frames are added to the stack.

Finish: You can tap Cancel at any time to stop the process. The final stacked image can be saved to your device's album. See Fig. 4.13. The raw image files can be downloaded using the MirroSky Desktop Client. See page 27 for more information.

Equatorial / Polar Mode

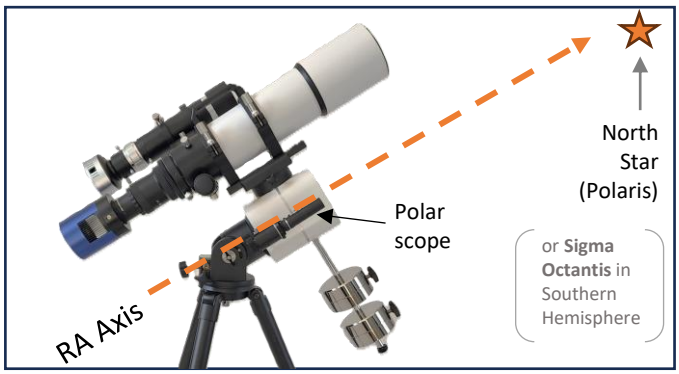

Fig. 4.14

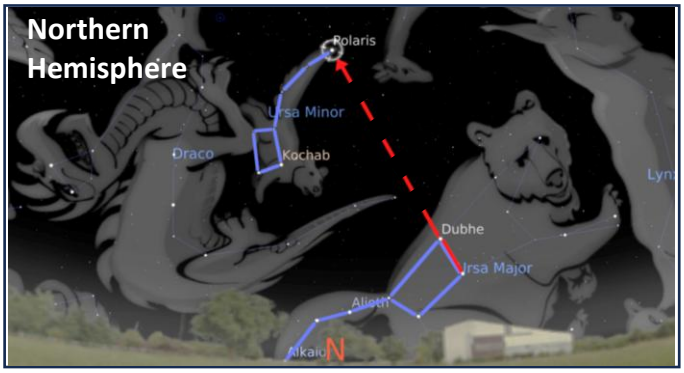

Fig. 4.15

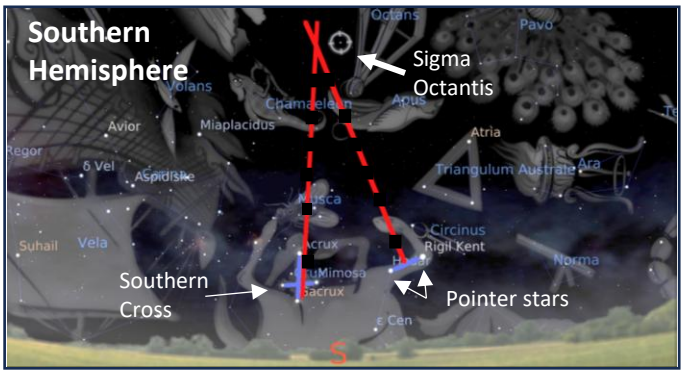

Fig. 4.16

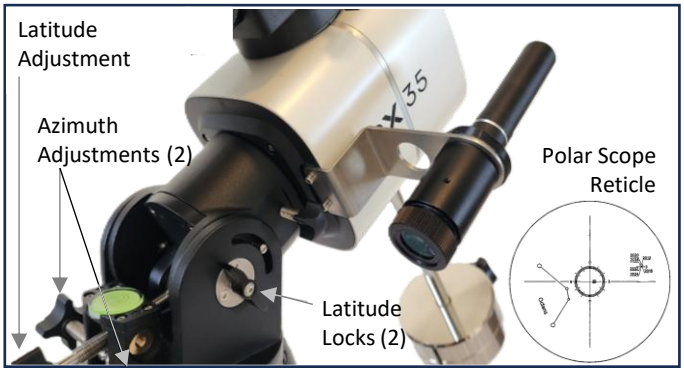

Fig. 4.17

OPERATING IN EQUATORIAL (EQ) MODE

For high-end astrophotography, using the HX35 or GX35 in an Equatorial (EQ) configuration is highly recommended. This setup eliminates field rotation, allows for significantly longer exposure times, and enables the use of the MirroSky Guiding System for pinpoint accuracy.

1. POLAR ALIGNMENT

To track the stars accurately, the mount's Right Ascension (RA) axis must be aligned with the North Celestial Pole (NCP) in the Northern Hemisphere or the South Celestial Pole (SCP) in the Southern Hemisphere.

- **Location:** Ensure you have a clear view of the northern sky (or southern sky if in the southern hemisphere).
- **OTA Co-alignment:** Before starting, verify that the 53mm guide scope and primary OTA are perfectly aligned (see "Procedure for OTA Alignment").
- **Home Position:** Start with the mount in the Polar Home Position. See Fig. 4.14.

USING A POLAR SCOPE (OPTIONAL ACCESSORY)

For the most precise results, use the optional **Polar Scope** available from Spectrum Optics.

1. **Sight the Pole:** Look through the polar scope to locate Polaris (NCP) or the Sigma Octantis (SCP) reference stars**.** See Fig. 4.15 or 4.16.

2. **Mechanical Adjustment Only:** Use **only** the Latitude and Azimuth adjustment knobs on the mount to center the pole. See Fig. 4.17.

   NOTE: Do not use the mount's motors or loosen the RA/Dec clutches during this process.

3. **Offset Compensation:** Polaris is offset from the actual NCP by approximately 0.75 degrees. Use the reticle inside your polar scope or a polar alignment app to compensate for this offset.

2. AUTO-GUIDING WITH MIRROSKY

In EQ mode, when the Guide feature is activated, the 53mm optics and MirroSky camera act as a "guide scope", locking onto a star to send real-time tracking corrections to the mount. This "closed-loop" system ensures long-exposure images remain sharp even at high focal lengths.

Guiding with the 53mm ED OTA

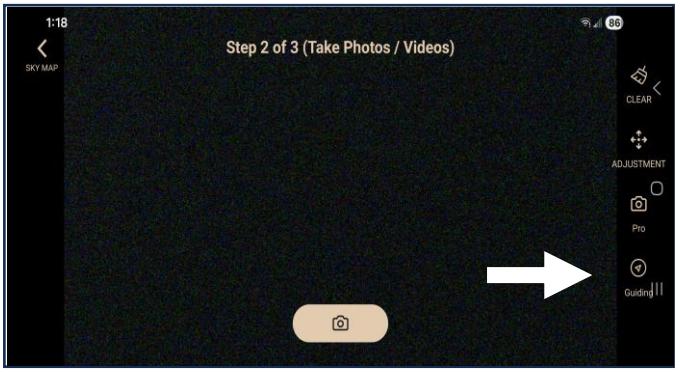

Fig. 4.18

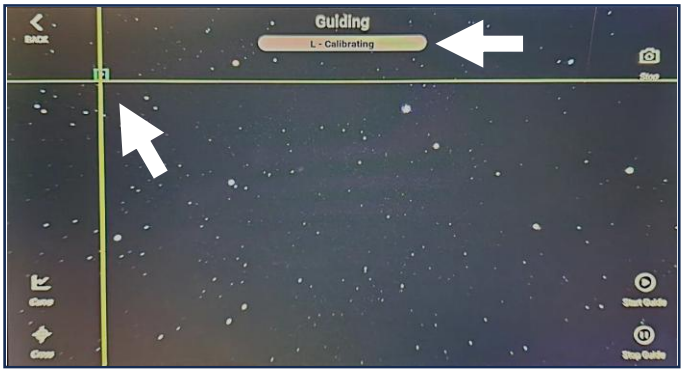

Fig. 4.19

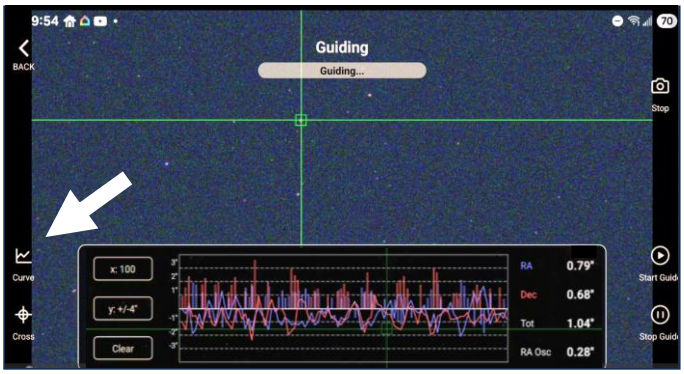

Fig. 4.20

Fig. 4.21

HOW TO START GUIDING:

1. **Select Target:** Slew to your object using the app. Once the "Plate Solve" routine confirms the target is centered, enter the Live View window to see the target.

2. **Open Guider:** Press the Guiding Button. See Fig. 4.18. A new window will appear.

3. **Calibration:** Press "Start Guide". The app will automatically select a suitable guide star and move the mount slightly in both axes to calibrate the correction speed (aggressiveness). See Fig. 4.19.

4. **Monitor Performance:** Tap the Curve button to view a real-time plot of the guiding corrections (measured in arc-seconds). You can scale the X (time) and Y (correction) axes for a better view. See Fig. 4.20.

5. **Stop Guiding:** Once your imaging session is complete, press **Stop Guide** before slewing to a new target.

3. TROUBLESHOOTING HIGH GUIDE CORRECTIONS

If your guiding graph shows large spikes or the stars appear trailed, check the following:

- **Balance:** Ensure the RA and DEC axes are perfectly balanced with your camera gear attached.

  Note: the HX35 RA axis uses a harmonic drive which can handle imbalances up to a 22 lb payload capacity. However, the mount will always perform better the closer is it to being balanced.

- **Polar Alignment:** Re-verify that your mechanical alignment on the Celestial Pole is accurate.

- **Stability:** Confirm the tripod, mount, and all accessory knobs are tightened securely.

- **Environment:** Check for high winds, local vibrations (e.g., walking near the tripod), or poor atmospheric "seeing."

- **Payload:** Ensure your total equipment weight does not exceed the mount's rated capacity.

How Dark Frames Improve Image Quality

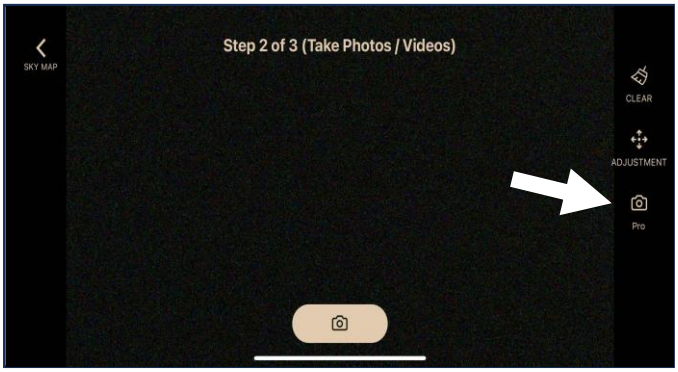

Fig. 5.1

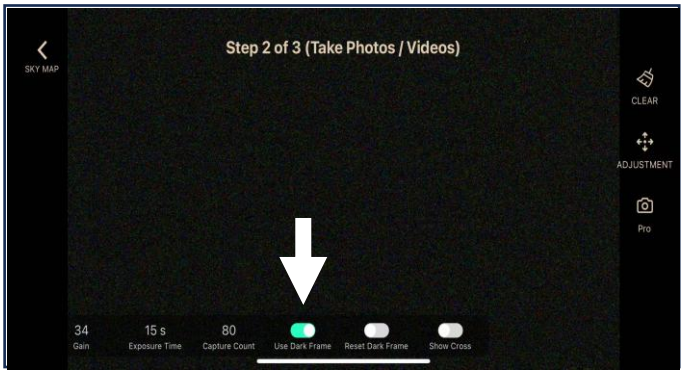

Fig. 5.2

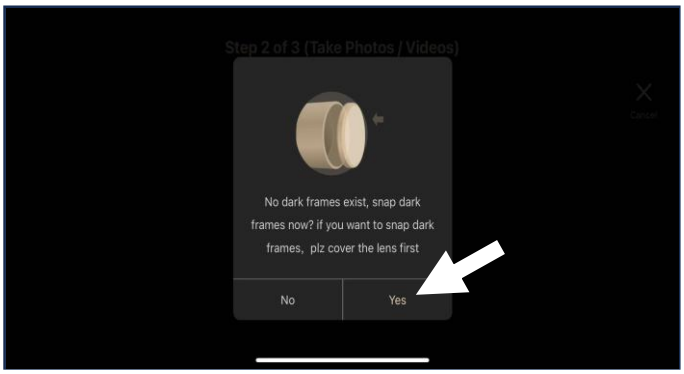

Fig. 5.3

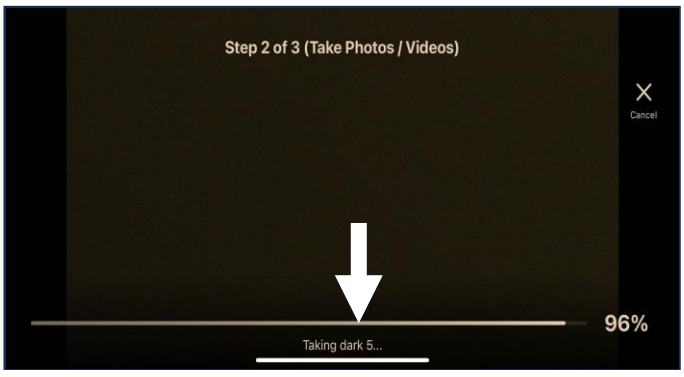

Fig. 5.4

IMPROVING IMAGE QUALITY WITH DARK FRAMES

To capture the cleanest possible images of deep-sky objects, the MirroSky app and Intelligent Camera utilizes Dark Frame Subtraction. This process removes unwanted electronic noise and artifacts from your final live-stacked image using the MirroSky Camera.

WHY USE DARK FRAMES?

Every digital sensor generates a small amount of "thermal noise" or "dark current," which increases as the camera warms up or as exposure times get longer.

- **Noise Reduction:** A dark frame is an image taken with the lens covered. It records only the camera's internal electronic noise. The app then subtracts this noise from your actual space photos.

- **Removing Hot Pixels:** Some sensor pixels may stay "on" (bright red, green, or blue dots). During live stacking, these can create unsightly colored streaks. Dark frames identify and neutralize these "hot pixels.“

Pro Tip: Because electronic noise changes with temperature, we recommend taking fresh dark frames at the start of every observing session for the best results.

HOW TO CAPTURE DARK FRAMES

1. **Select Your Target:** Use the GoTo function to slew to your desired object.

2. **Enter Pro Mode:** Tap the "PRO" icon on the right side of the screen. See Fig. 5.1.

3. **Enable Feature:** Tap the "Use Dark Frame" button at the bottom. See Fig. 5.2.

    - *Note: If you wish to clear previous dark frames from the current session, tap "Reset Dark Frame.“*

4. **Follow the Prompts:** If the app does not find a dark frame that matches your current Exposure and Gain settings, it will guide you through the collection process (Fig 5.3 & 5.4):

    - **Cover the Lens:** Place the dust cap securely over the front of the 53mm OTA. Ensure it is fully seated to prevent any light leaks.

    - **Start Capture:** Select "Yes." The app will automatically take 10 dark frames using your active settings.

How Dark Frames Improve Image Quality Cont'd

Fig. 5.5

5. **Resume Imaging:** Once complete, the app will prompt you to remove the dust cap.

The MirroSky app will now automatically apply these dark frames to every image you take using those specific settings.

IMPORTANT NOTES ON DARK FRAMES

- **Session Based:** Dark frames are stored in the camera's temporary memory. If you power down the telescope or unplug the mount, the dark frames will be lost and must be retaken during your next session.

- **Setting Specific:** If you change your Gain or Exposure Time, the app will prompt you to take a new set of dark frames to match the new settings.

THE DESKTOP CLIENT

The MirroSky Desktop Client is available to download from the Spectrum Optics website and allows for direct access to the Intelligent Camera System. Currently it is compatible with Windows 10 or later. As the Desktop Client is in development, features will be added when ready. Some features of the Desktop Client include:

- Exporting and deleting raw image files (this can also be done in app)
- Viewing image information
- Updating the Intelligent Camera firmware

To download the MirroSky Desktop Client, scan the QR code below or visit the Spectrum Optics website. https://spectrumoi.com/project/mirrosky-series/

Download for Windows

Using the Guide Scope as the Primary Imager

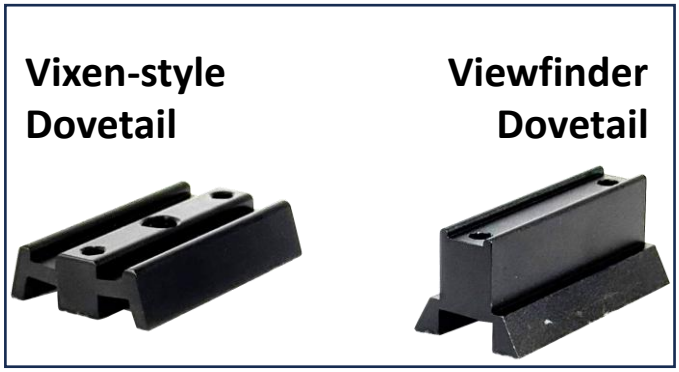

Fig. 6.1

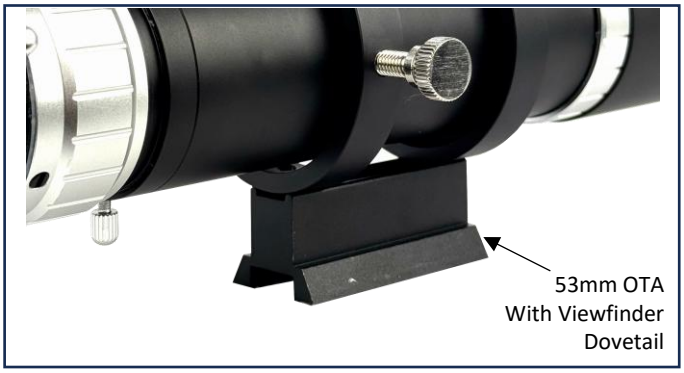

Fig. 6.2

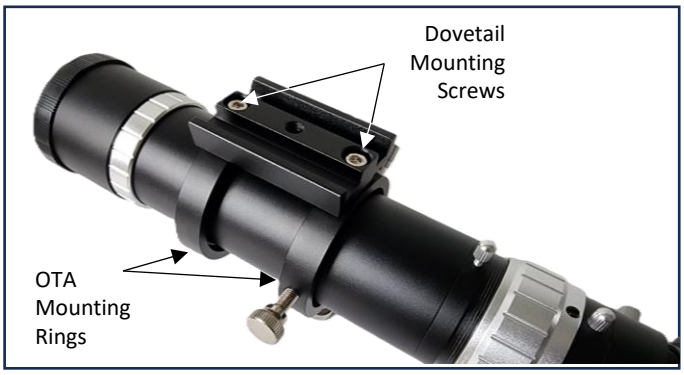

Fig. 6.3

Fig. 6.4

CONFIGURING THE 53MM ED GUIDE SCOPE

The HX/GX system includes a high-performance MirroSky 53mm ED Refractor equipped with an Intelligent Camera. While primarily designed as a guide scope for larger third-party telescopes, its premium optics allow it to function as a standalone, wide-field primary imaging telescope.

Versatile Mounting Options

- **As a Guide Scope:** The 53mm OTA features a standard viewfinder dovetail, allowing it to slide into the finder bracket of most third-party optical tubes.

- **As a Primary Telescope:** You can mount the 53mm OTA directly onto the HX/GX mount's saddle by switching to the wider Vixen-style dovetail (included).

SWITCHING TO THE VIXEN-STYLE DOVETAIL

To mount the 53mm ED Refractor directly to your HX or GX mount, follow these steps to swap the mounting hardware:

Remove the Viewfinder Dovetail:

Use a hex key to remove the two mounting screws from the bottom of the viewfinder dovetail bracket on the 53mm refractor (Fig. 6.2). Set the dovetail and screws aside.

1. Attach the Vixen-Style Bracket:

Align the included Vixen-style dovetail with the 53mm OTA rings. Secure it using the two provided M5 x 14mm silver color screws (Fig. 6.3).

Note: These screws are slightly longer than the original ones to account for the thicker plate. Tighten until firm.

2. Mount to the Saddle:

Slide the 53mm OTA into the HX/GX mount's dovetail receiver.

•**Check Orientation:** Ensure you are following the directional indicator marks on the mount.

•**Secure:** Tighten the OTA lock knobs to a firm feel to ensure the telescope is seated safely.

Your HX35/GX35 is a precision optical and electronic instrument. With proper care, it will provide years of peak performance. Follow these guidelines to protect your investment and maintain the integrity of the optics.

CLEANING THE OPTICS

The lenses of your telescope are treated with advanced optical coatings. Over-cleaning can be more harmful than a small amount of dust.

- **The "Minimal Cleaning" Rule:** A light layer of dust on the front lens will not significantly impact image quality. Only clean the optics if there are prominent smudges, fingerprints, or heavy debris.

- **Dust Removal:** Use a dedicated camel-hair optical brush, an ear syringe, or a manual "rocket" blower to gently remove loose particles.

  CAUTION: Avoid canned compressed air, as the chemical propellants can spray onto the glass and leave difficult-to-remove residue**.**

- **Removing Smudges:** For fingerprints or organic marks, use the following solution:
  - **Formula:** 3 parts distilled water to 1 part isopropyl alcohol, plus one drop of biodegradable dish soap.
  - **Method:** Use soft, white, unscented facial tissues (avoid those with lotions or dyes). Apply the solution to the tissue (never directly to the glass) and use very light, short strokes. Change tissues frequently to avoid rubbing grit back into the lens.

ENVIRONMENTAL PROTECTION

- **Managing Humidity:** If your telescope is damp from dew or high humidity, wipe the external metal surfaces dry with a cloth before storing.

  Do not wipe the optical glass. Instead, bring the telescope indoors and leave the dust caps off until the optics have completely air-dried. Storing a wet telescope with the caps on can lead to fungal growth, which can permanently etch the optical coatings.

- **Heat Exposure:** Do not store the telescope in a hot vehicle or in direct sunlight for extended periods. Excessive heat can degrade the internal lubricants and damage the sensitive electronics of the Intelligent Camera System.

SOLAR SAFETY WARNING

NEVER point the telescope at or near the Sun without certified, professionally manufactured solar filters installed on ALL optical tubes (including the guide scope).

Looking at the Sun—or even pointing the telescope near it—without a proper solar filter will cause:

- Permanent Blindness if looking through an eyepiece.

- Instant Destruction of the internal digital sensors and camera electronics.

- Melting of internal baffles and structural components.

- Note: Only use filters that fit securely over the *front* (objective) end of the telescope. Solar filters must be inspected for pinholes or scratches before every use.

Product Name	HX35 Smart EQ/AZ Telescope	GX35 Smart EQ/AZ Telescope
MOUNT	Alt/Azimuth and Equatorial Modes	
RA/Azimuth Gear	1:100 Harmonic Gear + Synchronous Belt + Electromagnetic Brake	144 Tooth Worm Gear + Synchronous Belt
DEC/Altitude Gear	144 Tooth Worm Gear + Synchronous Belt	144 Tooth Worm Gear + Synchronous Belt
Mount Payload Capacity (No counterweights)	22 lbs	Not Recommended
Mount Payload Capacity (Balanced with counterweights)	30 lbs	22 lbs
Dovetail Receiver	Vixen-Style	
Motor	Stepper	
Max Slew Speed	5 degrees/second	
Tracking Modes	Stellar/Lunar/Manual	
Compass	Built-in geomagnetic compass	
GPS	Location information received through MirroSky App	
Counterweight Shaft Mounting	M12 Threaded Hole	
Working Mode	Alt/Az or EQ	
Power Input	DC 12V 3A	
Mount Weight	9 lbs	
Working Current	0.75A Tracking, 1.6A GOTO	
Tripod	Optional. Requires 3/8” Threaded Connection	
GUIDE SCOPE SYSTEM	• 53mm ED Refractor with Helical Focuser	
	• Focal Length: 200mm, F/4	
	• Optical Coatings: Fully Multi-Coated	
	• Field of View w/ Intelligent Camera: 1.6 deg x 0.9 deg (approx.)	
Dovetail	Universal Viewfinder-style	
Intelligent Camera	• Sony IMX662 CMOS color sensor	
	• Pixel Size: 2.9µm	
	• Resolution: 1920 (H) x 1080 (V)	
	• 64GB onboard storage	
	• ADC: 12-bit	
	• No Amp glow	
	• Ports for Power (USB-C), USB 2.0, ST4	
Wi-Fi Band	2.4 & 5 GHz	
Software Application	MirroSky APP (available on iOS and Android)	
Astronomical Database	Over 100,000 objects	
WHAT'S IN THE BOX	• HX35 Mount	• GX35 Mount • Counterweight Shaft • Counterweight
	• 53mm ED OTA w/ Bracket • MS Intelligent Camera • AC Adapter • USB-C/USB-C Cables (2) • USB-C/USB-A Cable • USB-C/5.5mm Adapter • USB-A/USB-A Cable • Vixen-Style Dovetail • Polar Scope Bracket • Carry Case • Instructional Manual • Hex Wrenches (2) • Mounting Hardware	

WARRANTY

Thank you for choosing Spectrum Optics as your trusted source for telescopes, microscopes and other optical products. We stand behind the quality of our products and offer a TWO-YEAR limited warranty from the date of purchase within the US. If a defect is identified on a new product, Spectrum Optical Instruments will repair or replace a product with proof of original purchase. Please note that this warranty only applies to the original purchaser and it is not transferable. Any product that is purchased from anyone or organization other than Spectrum Optical Instruments or authorized dealer is not covered in this warranty.

Additionally, this warranty does NOT cover damage caused by misuse, mishandling, unauthorized repairs, or normal wear and tear. Spectrum Optical Instruments specifically disclaims special, indirect, or consequential damages or lost profit which may result from a breach of this warranty. Any implied warranties which cannot be disclaimed are hereby limited to a term of two years from the date of original retail purchase.

Spectrum Optics shall use reasonable efforts to repair or replace any product covered by this warranty within thirty days of receipt. In an event where repairing or replacement would require more than thirty days, Spectrum Optics shall notify the customer in advanced. Spectrum Optical Instruments reserves the right to replace any obsolete product with a new product of comparable price and performance.

Spectrum Optics reserves the right to change product specifications or to discontinue products without notice. This warranty gives specific rights. You may have other rights which vary from state to state. For warranty inquires, please contact: customer@spectrumoi.com

RETURN POLICY

As a condition to the obligation to repair or replace your product, the product needs to be returned to Spectrum Optical Instruments with proof of original purchase from Spectrum Optical Instruments or an authorized dealer.

A claim is required to be filed before return of a product. A claim template can be obtained from Spectrum Optical Instruments by email. Please contact customer service at customer@spectrumoi.com in such an event. Each return product must include a written statement detailing the nature of the claimed defect. As well as the original purchaser's name, address, and contact information.

Buyers are responsible for return shipping and handling cost for warranty services after 30 days of original purchase. Our warranty covers parts and labor only.

Spectrum Optics reserves the right to replace an obsolete product with a new product of comparable price and performance. In event of a defected product shall be replaced by a new product, the defected product become the property of Spectrum Optics. Spectrum Optics does not issue refunds but only repair or replacement.

CUSTOMER SERVICE

US-based team, Lightning-fast Response

When you reach out to us, you're not just getting assistance; you're connecting with a team of professional experts right here in California. We're proud to be based in the USA, and we stand by our commitment to provide you with answer and support within 24 hours. Your questions and concerns are our top priority.

Email us: customer@spectrumoi.com
Call us: (888) 879-5143
Visit out website: www.spectrumoi.com