

Quick Start Guide

HEM™ Hybrid Strain Wave GoTo Equatorial Mount Models: HEM27, HEM27EC, HEM44 and HEM44EC Series



PACKAGE CONTENTS¹

- Telescope mount HEM, with or without iPolar™ electronic polar scope
- Hand controller (HC) – Go2Nova®8409 with built-in WiFi
- 6P6C hand controller cable
- USB 2.0 cable
- AC adapter – 100-240V, 12V 5A DC output (for indoor use only)
- Carrying case
- Optional carbon fiber tripod (#8061)
- Optional external iGuider for autoguiding (#3360-HEM)
- Optional counterweight shaft (#8456SL) and counterweight (#3006-10)
- Optional pier extension (#8040)

ONLINE RESOURCES (www.iOptron.com)

- User's Manual
- Hand controller and mount firmware upgrades (check online for the latest version)
- ASCOM drive, Commander, Commander Lite and other computer control

¹Contents and design may change from time to time without notice.

HEM is operated under unbalanced condition and could be tipped over if tripod is not secured.

Please use "Search Zero Position" to set the mount before each session to avoid scope hit the tripod.

To avoid cable management system damage, there is a RA mechanical stopper designed to prevent the mount rotating over 360°. Do not slew 20° past the meridian or the stopper may be deformed due to a large torque of the strain wave gear system.

1. **Remove mount head from package:**

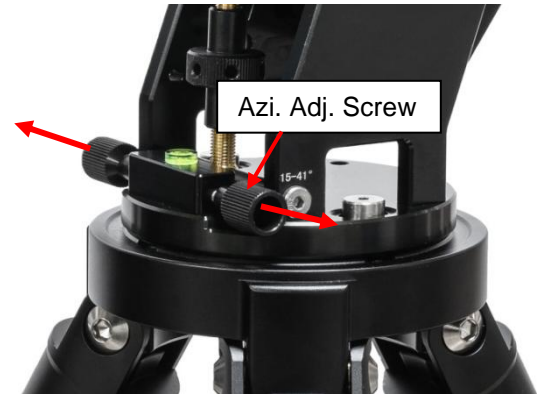


HEM27



HEM44

space for the alignment peg to be fitted in between the 2x Azi Adjustment Screws.

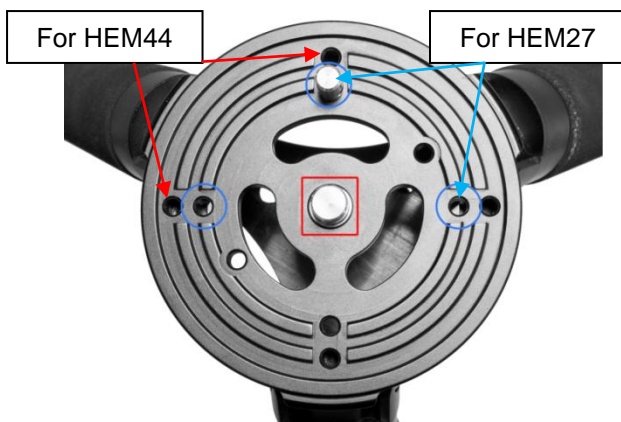


Remove the 2x Azi Locking Screws from the mount base. Secure the mount head by tightening the Azi Locking Screws into the M6 holes on the tripod. There is an Allen wrench stored on the mount base for tightening the screws or adjusting the latitude.



Level the mount by adjusting the tripod legs. Use the built-in Bubble Level Indicator or an external leveler for this purpose.

2. **Set up tripod:** Setup and level the tripod. Adjust the tripod height. Tighten tripod locking knob to secure the tripod. Thread the **Alignment Peg** onto the tripod head. It can be installed using a threaded hole on top of a tripod leg or between two legs (as shown) for low latitude.



3. **Attach mount head:** Retract the 2x Azimuth (Azi) Adjustment Screws from both sides to leave ample

4. **Adjust latitude:** Without any payload, slightly loosen 4X Latitude Locking Screws. Use the Latitude Adjustment Knob to set the correct latitude value, as displayed in the Latitude Mark Window.

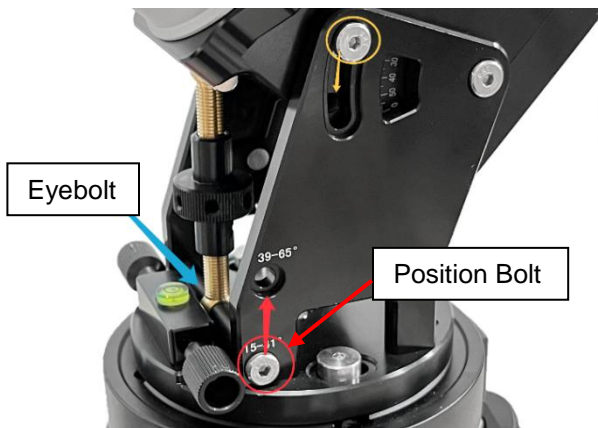


Insert the Allen wrench into the Latitude Adjustment Knob for more turning torque.

Two latitude ranges, 15~41° and 39~65°, can be set up for the mount head. To change the latitude range from one to the other, **both** the Latitude Position Bolt and the Latitude Locking Screws need to be moved to the correct locations.

To switch the latitude range:

- Loosen the Latitude Locking Screws just enough to adjust the latitude setting to between 39~41°. Tighten Latitude Locking Screws.
- Unthread and pull out the Position Bolt. Remove and do not lose the two black tubes. Insert the Position Bolt to a new latitude position with one black tube on.
- Adjust the Latitude Adjustment Knob while holding the bottom brass eyebolt until it lines up with the Position Bolt. Insert another black tube and secure the Latitude Position Bolt.
- Move the Latitude Locking Screws (one on each side) to the new locations revealed.



5. **Install telescope:** An HEM mount accepts a Vixen or a Losmandy-D dovetail mounting plate. The default is Vixen-type one.



Release the dovetail Saddle Locking Lever and slide the telescope dovetail plate into the saddle with Gear Switch disengaged. Make sure that the arrow sign on the saddle is pointing forward. Tighten the Saddle Locking Lever. **Pull the lever and turn** it to the position that the lever is parallel to the saddle to prevent it interfering with the DEC unit during mount GOTO and tracking.

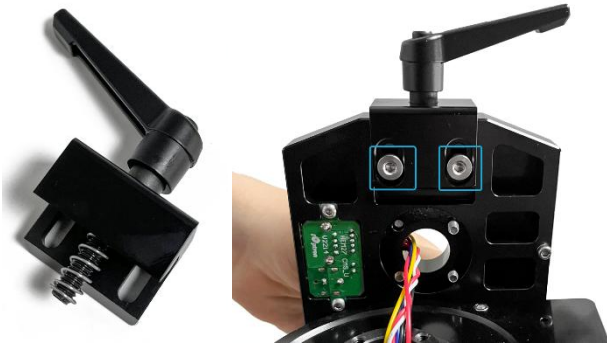
To convert dovetail saddle from Vixen-type to Losmandy-type.

(HEM44 has two locking blocks.)

- (1) Loosen the two socket screws (in red circles), flip and move the fixed block outward, then tighten the screws.

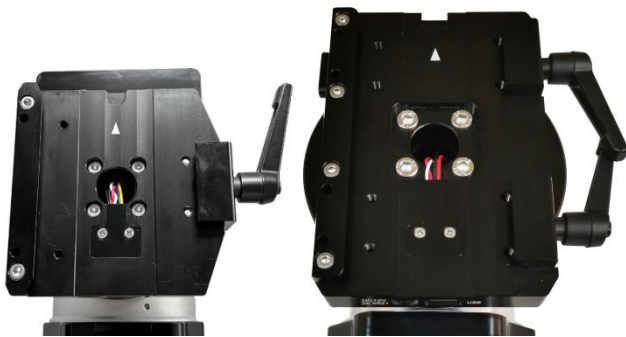


- (2) Remove two screws in blue circles and pull the dovetail saddle locking block from the saddle.
- (3) Release the four screws (in yellow circles) to separate the saddle from the mount. Flip the dovetail saddle locking block and secure it onto the saddle from bottom of the dovetail saddle.



(4) Put the dovetail saddle back and retighten the four yellow circled screws.

Here is a Losmandy-type dovetail saddle after converting (left HEM27, right HEM44).



6. **Connect cables:** Connect the Go2Nova® 8409 Hand Controller to the **HBX** port on the mount back. Plug in a 12V DC power supply to the **DC12V IN** socket.



7. **Balance payload:** No RA balance is needed for an HEM mount.

Turn the mount power on. Press number 9 to change the slew speed to max. Press ◀ or ▶ button to slew the telescope to one side of the mount. Hold the telescope and disengage DEC Gear Switch to check the balance. Release dovetail saddle locking lever and move the scope back and forth to adjust the position. Tighten the dovetail saddle locking lever and engage the gear switch after balancing completed.



Return the mount to Zero Position after balancing and engage DEC gear switch.

8. **Set Zero Position:** The **Zero Position** is the mount GOTO reference. Without setting the mount zero position properly, it may cause large GOTO error or even cause the scope to hit the tripod leg. The simplest way to find the mount Zero Position is using the zero position sensors. Press **MENU=> Zero Position => Search Zero Position**, then press **ENTER**. Follow the HC screen instruction to complete process.

9. **Set controller:** Press the **MENU** button; then “**Settings**”=> “**Set Time & Site**”.

```
2022-05-05 12:01:36
UTC -300 Minute(s)
W071d08m50s      DST: Y
N42d30m32s      Northern
```

Enter the current date. Enter the time zone offset to the UTC; for example:

- Boston is “UTC -300 minutes”
- Los Angeles is “UTC -480 minutes”
- Rome is “UTC +060 minutes”
- Sydney is “UTC +600 minutes”

Enter longitude and latitude coordinate of your location in D:M:S format. Toggle the Daylight Saving Time (DST) between N (No) and Y (Yes) using arrow key.

10. **Polar alignment:** For an HEM mount without iPolar (H272 and H442) or if the pole star is not in sight, you may use planetarium software to perform the polar alignment. You may also use two bright stars for coarse polar alignment.

(1) Level the mount and set it to the Zero Position. Align the telescope to the R.A. axis of the mount. An

eyepiece with an illuminated crosshair is highly recommended.

(2) Use the Hand Controller (HC) (**MENU** => "**Alignment**" => "**Polar Iterate Align**") to display the azimuth and altitude position of several bright stars near the meridian. Select one that is visible at a high altitude as Alignment Star **A**. Follow the HC instruction to move Alignment Star **A** to the center of the eyepiece using a combination of the **Latitude Adjustment Knob** and the "**◀**" or "**▶**" buttons. Press **ENTER** to confirm when the star is centered. Next, select a bright star that is close to the horizon as Alignment Star **B**. Center it using the **Azimuth Adjustment Knob** and the "**◀**" or "**▶**" button. Press **ENTER** to confirm the settings.

(3) The telescope will now slew back to Alignment Star **A**. Repeat the steps above. The iteration can be stopped when it is determined that the alignment error has been minimized. Press the **BACK** button to exit the alignment procedure.

For an HEM mount quipped with an iPolar™ electronic polar scope, refer to the iPolar Operation Manual from iOptron's website to perform the polar alignment, or steps briefly outlined below:



- Download and install iPolar Software (first time use);
- Connect a miniUSB cable between the iPolar port and a computer USB port;
- Click Connect and start polar alignment by following on screen instructions.

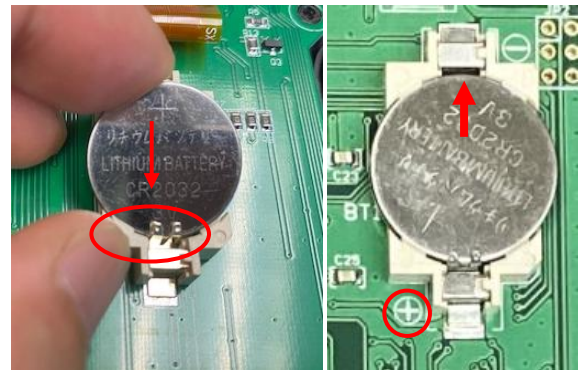
11. Manual operation: The mount can now be used to observe astronomical objects with the HC. Use arrow keys (**▶**, **◀**, **▼**, and **▲**) to point the telescope to the desired object. Use the number keys to change the slewing speed. Press **STOP/0** button to start/stop tracking.

Do NOT slew the mount past the RA stopper, which is about 20° below 0° altitude on either side!

12. Go to an object: The mount is now ready for GOTO and tracking targets. Press **MENU**, select and **ENTER Select and Slew**. Select a category (e.g., **Solar System**), then select an object of interest (e.g., **Moon**). Press **ENTER** and the telescope will slew to the object and automatically start tracking.

13. Sync to Target: If the object is not in the center of the eyepiece, use this function to center and synchronize the object to improve local GOTO accuracy. Press **MENU** and select and **ENTER Sync to Target**. Follow the on-screen instruction to perform the sync.

14. Install hand controller battery: The hand controller uses a CR2032 button battery to keep the Real Time Clock running. The HC is shipped without battery included/installed due to shipping restrictions. Open the HC back cover. With the battery + sign facing up, slide the battery under two small metal hooks on the positive side first (circled in red). Then push the battery down to make a good contact.



15. Mount control via a computer/SmartPhone/Tablet: One can control the HEM mount via USB on the 8409 hand controller or built-in WiFi. It supports ASCOM for Windows, third party INDI driver for MacOS or Raspberry PI, iOptron Commander Lite or SkySafari for iOS/Android. Some software also has iOptron mount driver embedded.

16. Put the mount back into the package/carrying case: It is recommended to return the mount to Zero Position at the end of the observation session. Lay the mount into the carrying case. Disengage the gear system for transportation.

Use support@ioptron.com for technical supports.
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B. The Proper Return Merchant Authorization Number must be obtained from iOptron in advance of return. Call iOptron at 1.781.569.0200 to receive the RMA number to be displayed on the outside of your shipping container.

All returns must be accompanied by a written statement stating the name, address, and daytime telephone number of the owner, together with a brief description of any claimed defects. Parts or product for which replacement is made shall become the property of iOptron.

The customer shall be responsible for all costs of transportation and insurance, both to and from the factory of iOptron, and shall be required to prepay such costs.

iOptron shall use reasonable efforts to repair or replace any telescope, mount, or controller covered by this warranty within thirty days of receipt. In the event repair or replacement shall require more than thirty days, iOptron shall notify the customer accordingly. iOptron reserves the right to replace any product which has been discontinued from its product line with a new product of comparable value and function.

This warranty shall be void and of no force of effect in the event a covered product has been modified in design or function, or subjected to abuse, misuse, mishandling or unauthorized repair. Further, product malfunction or deterioration due to normal wear is not covered by this warranty.

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If warranty problems arise, or if you need assistance in using your telescope, mount, or controller contact:

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Monday-Friday 9AM-5PM EST

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