# Quick Start Guide

## CEM40™ Center-balanced GoTo Equatorial Mount
## Model: CEM40, CEM40G, CEM40EC & CEM40-UNC (#C40XXX Series)

**PACKAGE CONTENTS**[1]

- CEM40 mount with internal iPolar™ electronic Polar Scope
- Go2Nova® Hand Controller (HC)
- Counterweight – 11 lbs (5 kg, #8027)
- Stainless steel counterweight shaft
- GPS module
- RJ11 coiled cables, x2
- USB cable
- AC adapter – 100-240V (DC output 12V/5A) with 2.5/5.5mm DC plug
- Alignment peg (located in mount head package)
- 1.5” or LiteRoc™ heavy duty tripod and accessory tray
- Optional hard case
- Quick Start Guide (this document)

**ONLINE RESOURCES** (at **www.iOptron.com**, under **Support**)

- User’s Manual
- Hand controller and mount firmware upgrades (check online for the latest version)
- ASCOM and Commander for computer control

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[1] The design, contents and packaging may change from time to time without notice.



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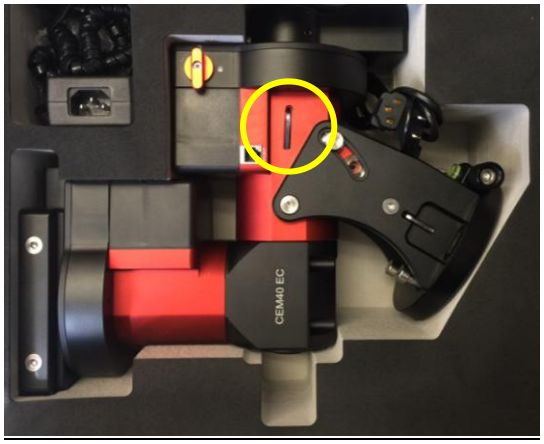
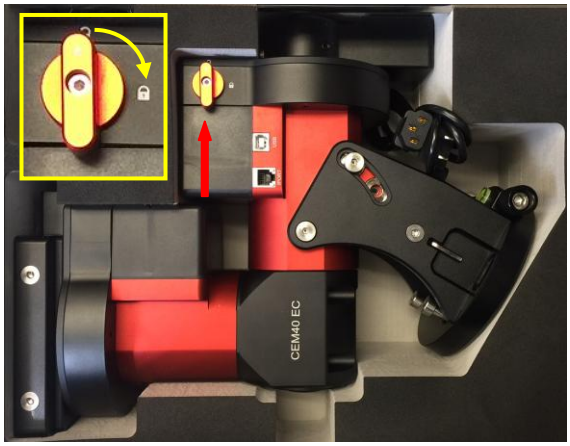
**STOP!!!** **Carefully read this Guide BEFORE setting up and using the equipment! Worm/gear damages due to improper uses are not covered by warranty.**

**WARNING: Never disengage Gear Switches without holding the mount firmly! Fail to do so may result in personal injuries and/or equipment damages.**

1. **Remove mount head from package:** The mount head is shipped with a R.A. Gear Switch unlocked to protect the worm/gear system. If a mount has a RA axle locking wrench, please make sure it is inserted in full before remove the mount from the box.

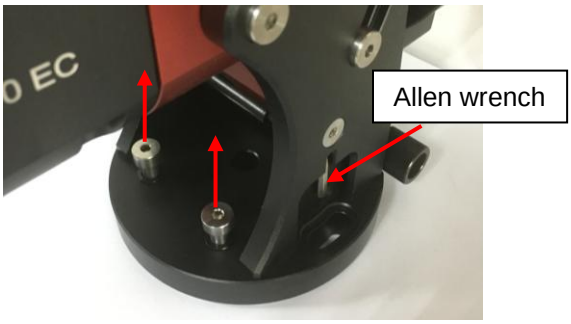



If there is no locking wrench, turn the Gear Switch 90° to lock the R.A. gear system before removing it from the box.




2. **Set up Tripod**: The tripod top is 120 mm in diameter with 2x M6 holes 103 mm apart for mounting. Two additional M6 holes are for the Alignment Peg (the one right next to one of the legs is for uses at high latitudes; the other one is for uses at low latitudes). Thread the Alignment Peg into the correct M6 hole. Insert the Accessory Tray through the center rod and secure the setup by tightening Locking Knob from underneath.


3. **Attach Mount Head:** Retract the 2x Azimuth (Azi) Adjustment Screws from both sides to leave ample space for the alignment peg to fit in between the 2 Azi Adjustment Screws. Remove the 2x Azi Locking Screws, with washers, from the mount base. Secure the mount head by tightening the Azi Locking Screws into the M6 holes on the tripod. An Allen wrench is included for convenience.

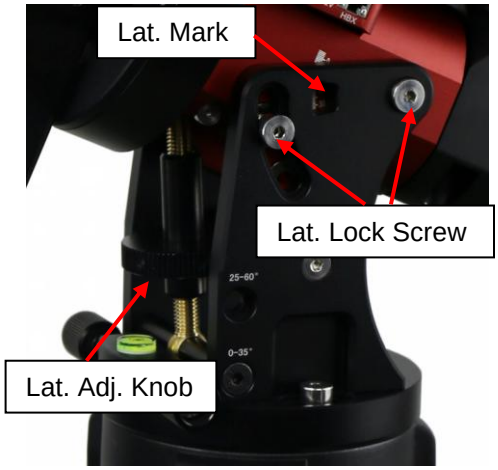




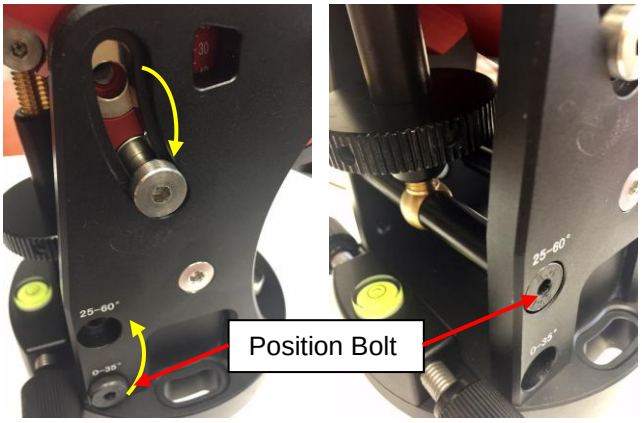
Level the mount by adjusting the tripod legs. Use the build-in Bubble Level Indicator or an external leveler for this purpose.

4. **Adjust Latitude:** Without any payload, slightly loosen the 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, 0~35° and 25~60°, 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 (see photos below).




Loosen the Latitude Locking Screws just enough to adjust the latitude setting to 30°. Move the Latitude Locking Screws with washers (one on each side) to the new locations revealed, do not tighten them just yet.

Unthread and remove the Position Bolt to its new location. Adjust the Latitude Adjustment Knob while holding the brass eyebolt until it lines up with the Position Bolt. Secure the Latitude Position Bolt.

Turn the dovetail saddle 180 degree to make sure the arrow mark on dovetail saddle is pointing to North.

5. **Install Counterweight (CW) Shaft:** Thread the CW shaft into the CW shaft mounting house. For low latitudes (<10°), a special CW mounting house is needed. (Contact iOptron for more information)

6. **Install Counterweight(s)**: Before putting on CW, make sure the mount is at its zero position, i.e., CW shaft points to the ground. **Disengage the R.A. Gear Switch to set the R.A. axis free before loading the CW.** Remove the CW Safety Cap at the end of CW Shaft. Glide the CW over the shaft with the larger hole opening facing down. Tighten the CW Locking Screw to hold the CW in place. Place the Safety Cap back onto the shaft. Move the CW to the bottom of the shaft and tighten the CW locking Screw.

**You may need more CW for heavier payloads, or a smaller CW for lighter scopes.**

7. **Install Telescope**: A CEM40 is equipped with a 6" Vixen/Losmandy-D dual saddle. It can receive either a Vixen or a Losmandy-D plate. The CEM40AG has an iGuider™ guiding system on the dovetail saddle.


8. **Balancing the Payload:** After attaching the scope and accessories, the mount head assembly must be balanced in both DEC and RA axes to ensure minimum stresses on the mount driving mechanism.

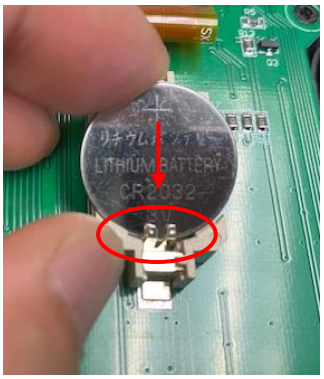
   **CAUTION: The telescope may swing freely when the R.A. or DEC Gear Switch is disengaged. Always hold on to the mount and/or telescope assembly before releasing the Gear Switches to prevent it from swinging, which can cause personal injuries and/or equipment damages.**

   Set the mount at Zero Position. Disengage both RA and DEC gear switches and move the mount to horizontal position to check balance. Return to Zero Position for balance adjustment. Balance the DEC axis by moving the scope with accessories back and forth in the mount saddle or within the scope mounting rings. Balance the assembly in R.A. axis by moving CW along its shaft. Repeat the process until both DEC and RA axes are balanced.

   **CAUTION: The balancing process MUST be done with Gear Switch at the total disengaged position! Otherwise it might damage the worm system.**

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

9. **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 installed due to shipping restrictions. Open the HC back cover. With battery + sign facing up, slide the battery under two small metal hooks on the positive side first. Then push the battery down to make a good contact.




10. **Connecting Cables:** Plug in included 12V/5A DC power supply to the DC12V 5A socket (5.5/2.5mm socket), which is located at the end of the RA axis.


   Connect the Go2Nova® Hand Controller to the HBX port on the mount main board using a 6P6C coiled cable.


   Plug GPS module into the iPORT with a coiled cable.


11. When powering on, GPS ON sign should be displayed at the upper right corner of the hand controller. You may disconnect the GPS module after it picks up satellites signals and displays GPS OK. (It takes about 1 to 2 minutes in normal conditions).

12. **Polar Alignment:** CEM40 equipped with an iPolar™ electronic polar scope. To perform polar alignment, please refer to CEM40 User's Manual, or iPolar Operation Manual from iOptron's website, or steps briefly outlined below:
    - Download and install iPolar Software (first time use)
    - Connect a USB cable between the USB2.0 port on the rear end of the mount RA axle and a computer USB port

- Click Connect and start polar alignment by following on screen instructions

For the mount without polar scope, please refer to full manual for ***Bright Star Alignment***, or use software to assist alignment.

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

14. **Set Controller:** Press the **MENU** button; then **Settings** => **Set Time and Site**.


Before GPS picks up signals (before displaying GPS OK), check for **Daylight Saving Time** using arrow key to toggle between **Y** and **N**. Enter the time zone offset to the UTC; for examples:

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

Waiting for the mount to pick up the GPS (you'll hear beep). If the GPS is "OK'd" during setup, just power cycle the mount. Double check the HC display and it should show correct local time.

[**TIPS**: All time zones in N. America are "UTC -XXX minutes". Latitude and longitude coordinates can be obtained from GPS-equipped devices (navigator, phone), or from internet and entered manually, in case GPS cannot receive enough satellites signals (unplug the GPS module) or GPS malfunctions. "W/E" = western/eastern hemisphere; "N/S" = northern/southern hemisphere. Use arrow and number keys to enter location and time information.]

15. **Set Zero Position:** The **Set Zero Position** command registers the current position as zero position. So before registering, the mount should be physically set at Zero Position either manually or slewed by hand controller. The Zero Position is defined as the telescope being on top of the mount head and pointing to North Pole, with CW shaft pointing to the ground. To register, press **MENU** => **Zero Position** => **Set Zero Position**. Press **ENTER** to confirm. One can also use **MENU** => **Zero Position** => **Search Zero Position** to set the zero Position.

16. **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.

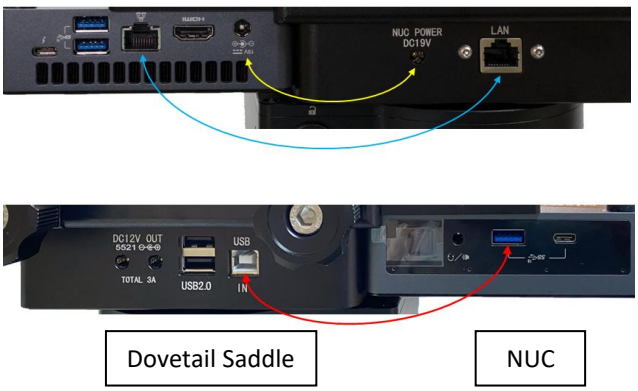
17. **Sync to Target:** If the object is not in the center of the eyepiece, use this function to center and synchronize the object to improve local GOTO accuracy. Press **MENU** and select and ENTER ***Sync to Target***. Follow the on-screen instruction to perform the sync.

[**TIP**: After slewing to an object, a list of nearby bright object(s) can be displayed by pressing the **?** button.]

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

**CEM40-NUC and Cable Connection:**

For a CEM40-NUC, the thickness of a NUC should be less than 38mm, such as an Intel Frost Canyon with "Slim" K chassis BXNUC10i3FNKN1.




Please contact support@ioptron.com for technical support.

V2.0

# IOPTRON TWO YEAR TELESCOPE, MOUNT, AND CONTROLLER WARRANTY

A. iOptron warrants your telescope, mount, or controller to be free from defects in materials and workmanship for two years. iOptron will repair or replace such product or part which, upon inspection by iOptron, is found to be defective in materials or workmanship. As a condition to the obligation of iOptron to repair or replace such product, the product must be returned to iOptron together with proof-of-purchase satisfactory to iOptron.

B. The Proper Return Merchant Authorization Number must be obtained from iOptron in advance of return. Contact iOptron at support@ioptron.com 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, such as transportation, insurance and fees, 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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Some states do not allow the exclusion or limitation of incidental or consequential damages or limitation on how long an implied warranty lasts, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

iOptron reserves the right to modify or discontinue, without prior notice to you, any model or style telescope.

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

NOTE: This warranty is valid to U.S.A. and Canadian customers who have purchased this product from an authorized iOptron dealer in the U.S.A. or Canada or directly from iOptron. Warranty outside the U.S.A. and Canada is valid only to customers who purchased from an iOptron Distributor or Authorized iOptron Dealer in the specific country. Please contact them for any warranty.