

## Quick Start Guide

### CEM60™ Center-Balanced GoTo Equatorial Mount Models: #7200, #7201



#### PACKAGE CONTENTS<sup>1</sup>

- Telescope Mount – with GPS, and AccuAlign™ dark field illuminated Polar Scope
- Hand Controller (HC) – Go2Nova® #8407+
- Counterweight – 21 lbs X1 (9.5 kg)
- Stainless Steel counterweight shaft
- HC Controller Cable
- RS232-RJ9 serial cable
- Polar scope LED cable
- AC Adapter – 100-240V
- Hard case
- Quick Start Guide (this document)
- Tripod NOT included

#### ONLINE RESOURCES (at [www.iOptron.com](http://www.iOptron.com), under “Support”)

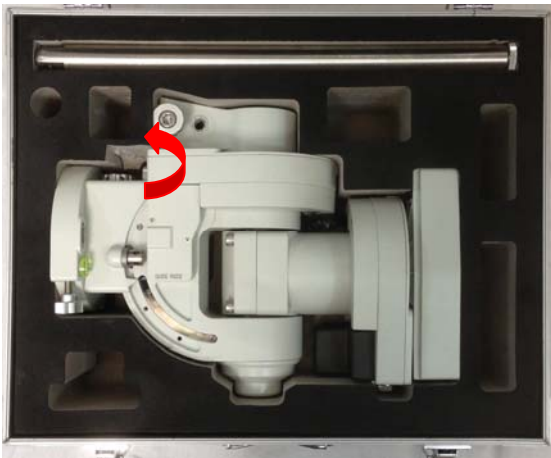
- User’s Manual
- Tips for set up and using the products
- Hand controller and mount firmware upgrades (check online for the latest version)
- Reviews and feedbacks from other customers

<sup>1</sup> The design and packaging may change from time to time without notice.

**WARNING: This product uses a magnetic force gear meshing mechanism. Read this QSG and full manual before operation. Worm system damage due to user operation error will not be covered by warranty.**

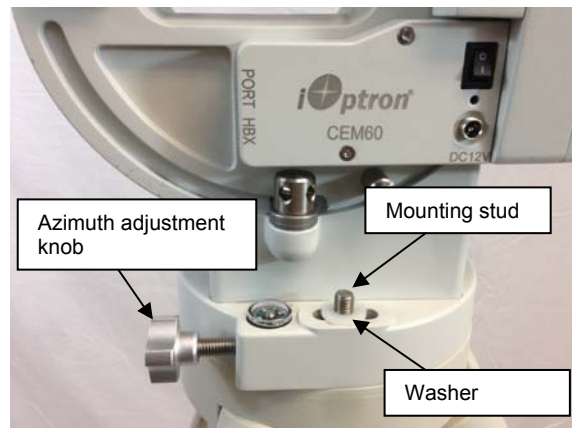
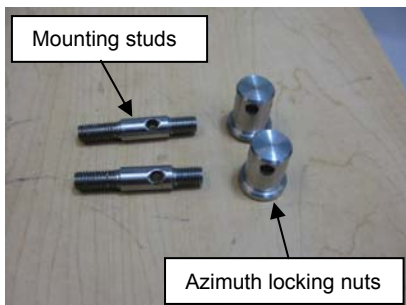
**WARNING: Never disengage or adjust the Gear Switches without holding the mount firmly! Personal injury and/or equipment damage may happen.**

1. **Removing the mount from the carrying case:** The mount is shipped with R.A. Gear Switch disengaged. **ALWAYS** turn the gear switch *counterclockwise* all the way out to fully engage the Gear Switch before removing the mount from the carrying case.



Back out the azimuth adjustment knobs to make enough room to prevent blocking the mounting studs. Put the mount head onto the tripod, with the mounting holes through the mounting studs.

2. **Attaching the Mount:** The mount has a 150mm diameter base which can be mounted onto an optional iOptron 2" tripod or pier. There are two sets of mounting studs and azimuth locking nuts.

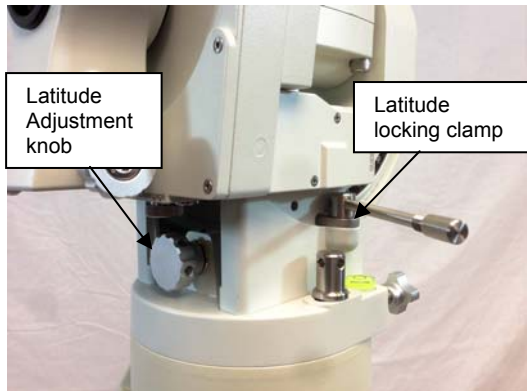


Install the washer (optional). Put the azimuth locking nuts onto the mounting studs, hand tighten them. There is a stainless steel (SS) lever which can be unthreaded from the mount. It can be used for tightening all the screws/nuts.

Thread the two studs onto an iOptron tripod/or pier (if you are using one). Remove the alignment peg from the tripod/pier if it comes with one. Use the pair of mounting holes that are closest to the edge and thread the studs on to it. Use included stainless steel lever (refer to the photo in next column) to tighten the mounting studs.



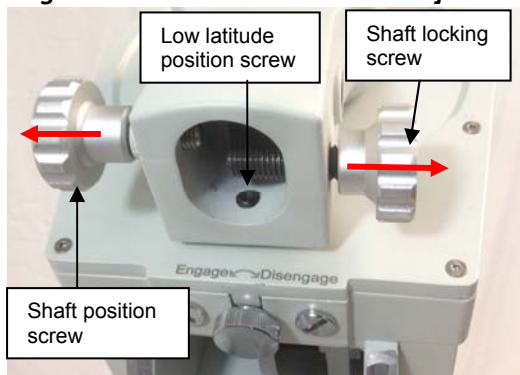
- Setting the Latitude:** Unthread the SS Lever from its housing. Slightly loosen the Latitude Locking Clamps.



Turn the Latitude Adjustment Knob until the arrow points to your current latitude on the Latitude Scale. Tighten the Latitude Locking Clamps when done.



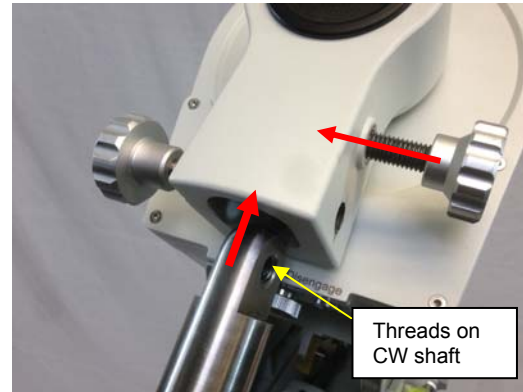
- Installing the Counterweight (CW) Shaft:** There are three screws on CEM60 CW Mounting Housing: A Shaft Locking Screw, a Shaft Position Screw on the other side and a Low-Latitude Position Screw. *[The later version has two-part CW shaft that only needs threaded the CW shaft on. The Shaft position locking screws do not have the knobs.]*



To install the CW shaft, (1) Remove CW Shaft Locking Screw from the CW Mounting Housing and back out the CW Shaft Position Screw to make room for the CW shaft; (2) Insert CW Shaft into the CW Mounting Housing. Make sure the rounded top of the shaft is fully engaged in the slot; (3) Insert the CW Shaft Locking Screw into the TOP hole and **thread it onto**

**the CW shaft;** (4) Tighten the CW Shaft Position Screw.

[TIP: At very low-latitudes (<math><10^\circ</math>), to avoid CW bumping into tripod leg, turn the rear Low Latitude Position Screw (a hex head set screw) further into CW Mounting Housing before tightening the Front CW Shaft Positioning Screw.]

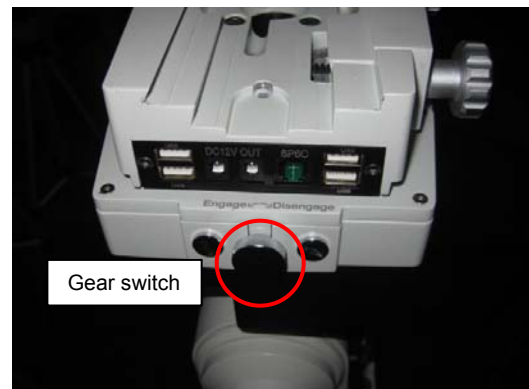


- Installing the Counterweight(s):** Before installing the Counterweight, **make sure that both R.A. and DEC Gear Switches are fully engaged** to avoid sudden mount movements, which could injure you or damage the mount gear system.

**Make sure the mount is at zero position (i.e. counterweight shaft is pointing to ground when the counterweight is installed.)**

Remove the CW Safety Cap at the end of CW Shaft. Guide the CW over the shaft. Tighten the CW Locking Screw to hold the CW in place. **Always place the Safety Cap back onto the shaft prior to use to prevent personal injury and/or equipment damage.**

- Balancing the Payload:** After attaching the scope and accessories, the mount head assembly must be balanced in both R.A. and DEC 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 injury and/or equipment damage.**

The CEM gear system utilizes a magnetic force system for optimal gear meshing. Fully turn the Gear Switch *clockwise* to disengage the worm from the worm wheel. Turn the Gear Switch *counterclockwise* to engage the worm to worm wheel, as indicated on the mount. You may feel a “click” when the gear meshed.

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

With the corresponding Gear Switch disengaged, balance in 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.

Only balance one axis at a time and start with the DEC axis first. Double check the mount to make sure both the RA and DEC axes are balanced.

Return the mount to the Zero Position after balancing; i.e., the CW Shaft points to ground, and the telescope tip is at its highest position.

- 7. Connecting Cables:** Plug in a 12V DC power supply to the DC12V POWER socket. Connect the Go2Nova<sup>®</sup> 8407 Hand Controller to the HBX port on the mount side panel.



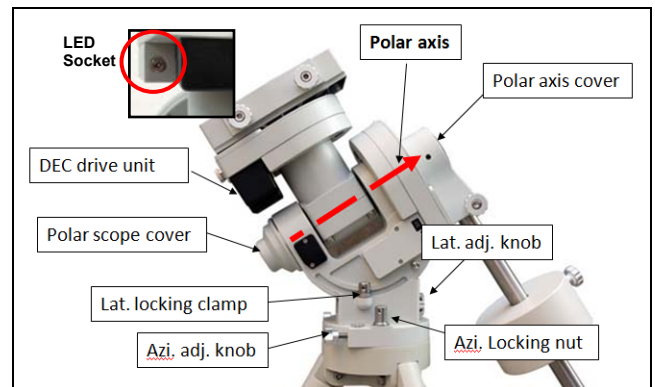
Refer to the full User’s Manual on how to use the cable management system.

- 8. Setting Gear Switch Position:** Set both Gear Switches to engaged positions after balancing the mount. To make sure the gears are meshed properly, gently turn

the Gear Switch *counterclockwise* until you just feel the stop, but never over tightening. More adjustment may be needed as described below.

Turn the mount power on. Press 9 button on hand controller to change the slew speed to MAX. Press the arrow button to check the gear meshing. If the mount motor has “grinding” sound (which is not harmful) while slewing, the gear switch is too tight. Release 1/16 to 1/8 turn and check it again. If there is excess play in either RA or DEC axis, the gear and worm is not properly meshed. Turn the Gear Switch more counterclockwise. You may need to readjust the gear switch for different payload.

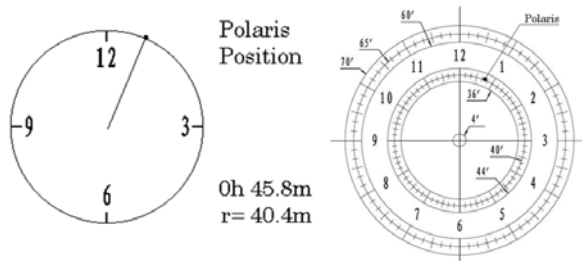
- 9. Performing Polar Alignment:** Remove both Polar Scope and polar axis covers. Look through the polar scope to locate *Polaris* (or *Sigma Octantis* at southern hemisphere). Slightly loosen the Azimuth Locking Nuts and Latitude Locking Clamps. Use the two Azimuth Adjustment Knobs on the side to center the pole star in the azimuth direction. Use the Latitude Adjustment Knob for the latitude adjustment. Tighten the nuts and clamps after adjusting.



### **Quick Polar Alignment**

Fast and accurate polar alignment can be performed with iOptron’s AccuAligning<sup>™</sup> Polar Scope.

- (1) Connect the Polar Scope illumination LED to the Reticle socket located next to DEC drive unit (see insert above). Turn the mount power on. Use Hand Controller (“**Settings**” => “**Set Eyepiece Light**”) to set the illumination intensity.
- (2) Use Hand Controller (**MENU** => “**Align**” => “**Pole Star Position**”) to display the Polaris Position on the LCD screen, as indicated below. For example, June 22, 2014, 20:19:42 in Boston, US (alt N42°30’32” and long W71°08’50”), 300 min behind UT, the Polaris Position is 0h45.8m and 40.4m.



(3) Use the Azimuth and Latitude Adj. Knobs to adjust the mount in both directions and put the Polaris in the location on the Polar Scope Dial (same as indicated on the HC LCD), as shown in the right side of the above figures.

### BrightStar Polar Alignment

When the pole star is not in sight, refer to online Instruction Manual for *BrightStar Polar Alignment*.

- 10. 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 the **STOP/0** button to start tracking.
- 11. Setting Controller:** Press the **MENU** button; then “Settings” => “Set Time & Site”.



Enter the current date and check for Daylight Saving Time using arrow and number keys. 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”

Move the cursor to the end of screen to select the Northern or Southern Hemisphere.

[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. “W/E” = western/eastern hemisphere; “N/S” = northern/southern hemisphere;

and “d” = degree; “m” = minute; and “s” = second. Use arrow and number keys to enter location information.]

- 12. Set Zero Position:** Set the mount to ZERO position by pressing **MENU** => “Zero Position” => “Set Zero Position”. Use the hand controller to, or manually move the mount to zero position, *i.e.* telescope on top of the mount and pointing to North Pole with CW shaft pointing to ground. Press the **ENTER** to confirm. Perform **Set Zero Position** if the lost its power during slew or after firmware upgrading.
- 13. One Star Alignment:** Perform a **One Star Align** to correct the Zero Position discrepancy and improve the GOTO accuracy. To further improve the GOTO accuracy, refer to the full User’s Manual for more details.
- 14. 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 (for example, “Solar System”), then select an object of interest (for example, “Moon”). Press **ENTER** and the telescope will slew to the object and automatically start tracking.
- 15. 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”. Use arrow keys to center the object in eyepiece. Press **ENTER** again to complete this function.  
[TIP: “Sync to Target” will only function after a “Select and Slew” operation. This is most useful when looking for faint objects near a bright star.]  
[TIP: After slewing to an object, a list of nearby bright object(s) can be displayed by pressing “?” button.]
- 16. Putting the mount back into the carrying case:** It is recommended to park your scope at the end of the observing session. Please refer to online instruction manual for more information. Make sure that the Gear Switches are fully engaged before removing the mount from the tripod. Lay the mount into the carrying case. **Turn the R.A. Gear Switch clockwise all the way in to disengage the gear system for transportation.**

Use [support@ioptron.com](mailto:support@ioptron.com) for technical support.

## 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 1.781.569.0200 or [support@ioptron.com](mailto: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:

iOptron Corporation  
Customer Service Department  
6F Gill Street  
Woburn, MA 01801  
[www.ioptron.com](http://www.ioptron.com)  
[support@ioptron.com](mailto:support@ioptron.com)  
Tel. (781)569-0200  
Fax. (781)935-2860  
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.