

## 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.

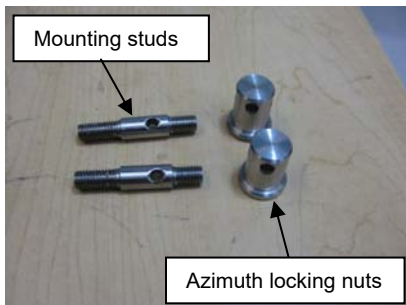
**WARNING: This product uses a magnetic force gear meshing mechanism. Read this QSG and full manual before operation. Worm system damage due to user operation error will not be covered by warranty.**

**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. axis locked with a stainless steel lever. Just pull the mount out from the carrying case.



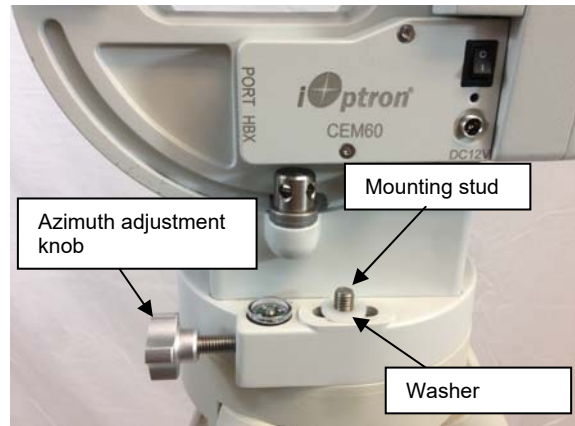
2. **Attaching the Mount:** The mount has a 150mm diameter base which can be mounted onto an optional iOptron 2" tripod or pier. There are two sets of mounting studs and azimuth locking nuts.



Remove the alignment peg from a iOptron tripod/pier if it comes with one. Thread the two studs

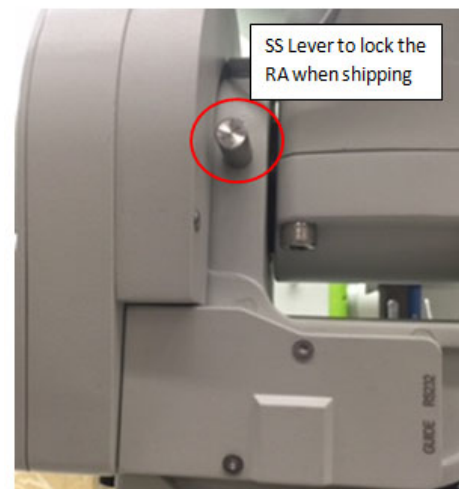
onto the tripod/or pier. Use the pair of mounting holes that are closer to the edge.

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



Install the washer (optional). Put the azimuth locking nuts onto the mounting studs, hand tighten them.

There is a stainless steel (SS) lever which is used to lock the RA axis during shipping on some later version mount, as shown in the following picture.

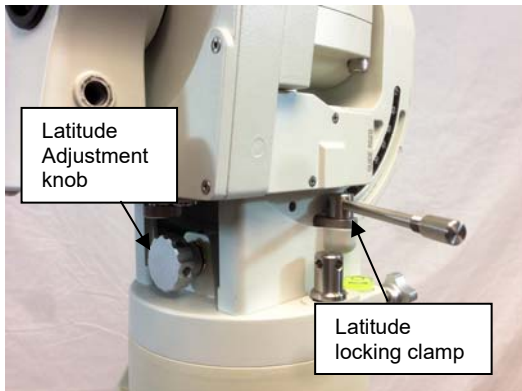


Remove it from the RA yoke to allow the mount slew freely in RA axis. **Make sure the RA gear switch is engaged before remove the SS lever.** Use it to

tighten all the screws/nuts. Thread it into the hole under the main board.



- Setting the Latitude:** Slightly loosen the Latitude Locking Clamps, use the SS lever if needed.



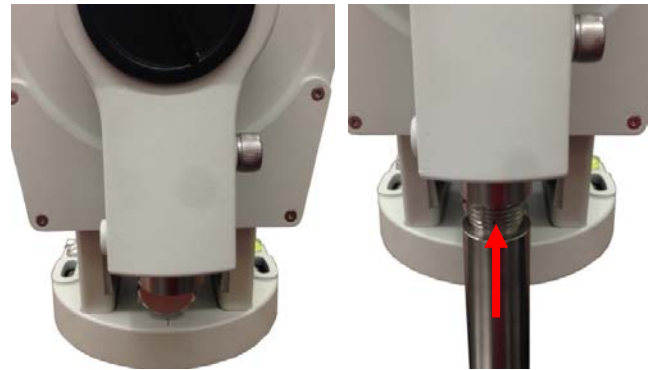
Turn the Latitude Adjustment Knob until the arrow points to your current latitude on the Latitude Scale. Tighten the Latitude Locking Clamps when done.



- Installing the Counterweight (CW) Shaft:** The CW shaft system is a two part configuration, it comes with preinstalled top part of the shaft. Just simply thread the CW shaft onto it.

There are three screws on CEM60 CW Mounting Housing: A large Shaft Locking Screw, a Shaft Position Screw on the other side and a Low-Latitude Position Screw in the back.

[**TIP:** If you latitudes is lower than 10°, please refer to the full online manual to adjust the counterweight shaft position to avoid CW bumping into tripod leg.]



- Installing the Counterweight(s):** Before installing the Counterweight(s), 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.)**

**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. Guide the CW over the shaft. Tighten the CW Locking Screw to hold the CW in place. **Place the Safety Cap back onto the shaft.**

**You may need more CW for heavier payload, or smaller size CW for lighter scope.**

- 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.

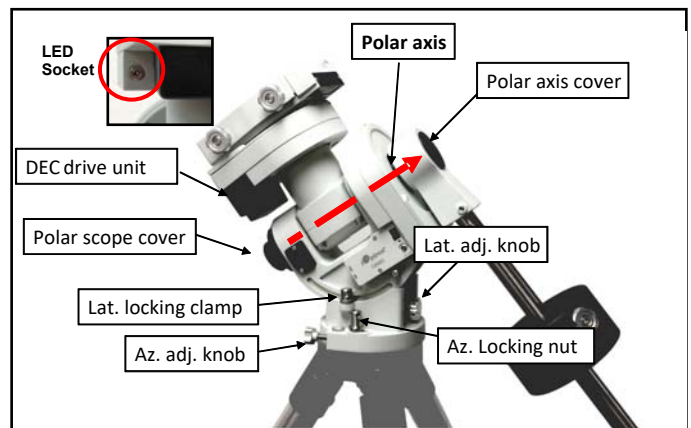


- 8. Setting Gear Switch Position:** Set both Gear Switches to engaged positions after balancing the mount. To make sure the gears are meshed properly, gently turn the Gear Switch *counterclockwise (CCW)* until you just feel the stop, but never over tightening. More adjustment may be needed as described 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 (*clockwise, CW*) 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 **CCW**. You may need to readjust the gear switch for different payload.

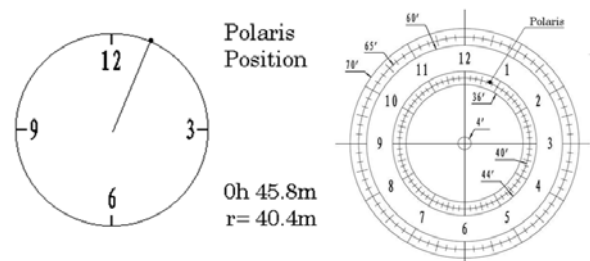
- 9. Performing Polar Alignment:** Remove both Polar Scope and polar axis covers. Look through the polar scope to locate *Polaris* (or *Sigma Octantis* at southern hemisphere). Slightly loosen the Azimuth Locking Nuts and Latitude Locking Clamps. Use the two Azimuth Adjustment Knobs on the side to center 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.

- 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**” => “**Polar Scope Brightness**”) to set the illumination intensity.
- Use Hand Controller (**MENU** => “**Alignment**” => “**Position of Polaris/SigmaOct**”) to display the Polaris Position on the LCD screen, as indicated below. For example, June 22, 2014, 20:19:42 in Boston, US (long. W71°08’50” and lat. N42°30’32”, UTC -300 min,) the Polaris Position is 0h45.8m and 40.4m.





(3) Use the Azimuth and Latitude Adj. Knobs (not hand controller) 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 **Polar Iterate Align**.

- 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 and Site"**.



Before GPS pickup the signal (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 OKed 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, if

GPS can't connected to the satellites or GPS malfunctions. "W/E" = western/eastern hemisphere; "N/S" = northern/southern hemisphere. Use arrow and number keys to enter location information and current time.]

- 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. Check/Set the Zero position before each observation session.
- 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"**. 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 **"?"** button.]
- 16. Putting the mount back into the carrying case:** It is recommended to return the mount to Zero Position at the end of the observing session. Insert the SS lever into the RA locking hole on the yoke to lock the RA axis. Disengage the gear system for transportation. Lay the mount into the carrying case.

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:

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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.