

CEM60 Firmware Upgrade History

V20140115 **Beta Testing** (main board)

V20140214 **Beta Testing** (R.A., DEC motor control boards, Hand Controller)

V20140423 **Initial release** (HC, main board, R.A. and DEC boards)

V20140526 Firmware upgrade for main board, R.A. and DEC board

V20140527 Firmware upgrade for HC

- Improvement of EC version guiding
- Fixed the bug that may cause mount stopping tracking randomly;
- Fixed incorrect moving speed of 1x and 2x;
- Fixed the bug that will cause PEC playback not working properly;
- Added multi-language interface of HC, Simplified Chinese added;
- Other improvements.

V20140720 Firmware upgrade for main board, R.A. and DEC board

V20140721 Firmware upgrade for HC

New features:

1. Coordinates auto-saving feature added. If the power is lost by accident while mount is tracking, the mount will restore its coordinates when the power is back. It does not work while the mount is slewing.
2. Set Zero Position function added. Now you can manually set the mount zero position using hand controller. Note: The zero position has to be reset after firmware updating, or if the mount losing its power during slewing.
3. GPS will auto refresh every 6 minutes.

Improvements:

- Greatly optimize the size and speed of hand controller firmware.
- Number input module of hand controller has been rewritten.
- Auto-guiding in both R.A. and DEC axes has been improved.
- The algorithm to calculate the position of pole star has been further improved.
- The algorithm to calculate the zero position has been improved.
- Fixed the error that the mount sometime may slew to an incorrect position of a star
- Fixed the display error after mount parked successfully
- Other improvements

V20140825 Firmware upgrade for HC, main board, R.A. and DEC board

Improvements:

- Improved tracking performance of EC model.
- Improved guiding performance.
- Improved the algorithm of Two Star Polar Alignment.
- Using the latest (UCAC4) catalog data for calculating position of Polaris and Sigma Oct.
- Optimize the communication protocol.
- Fixed a bug of sometimes PEC recording will fail.
- Fixed a bug in calculating position of pole star.
- Other minor improvements.

Note:

- ASCOM driver 3.0 and iOptron Mount Control Center 3.0 require this firmware release or later.
- SkySafari Plus and Pro will not work with this firmware release until SkySafari updates its communication protocol with the iOptron mount.

V20140928 Firmware upgrade for HC, main board, R.A. and DEC board

Improvements:

- Tracking and guiding performance has been further improved.
- The EC encoder now works with guiding command seamlessly.
- PEC now works with guiding command seamlessly.
- Meridian Treatment has been improved:
 - The position limit passed meridian and behavior (stop or flip) could be set.
- **Note:**
 - (1) The position limit of CEM60 is: Northern Hemisphere 15 degrees, or 1 hour; Southern Hemisphere 10 degrees, or 40 minutes.
 - (2) The position limit of iEQ45 Pro is 30 degrees, or 2 hours.
- The pointing accuracy after meridian flip has been improved.
- Renamed Polar Align to Polar Iterate Align.
- Replaced Display Pole Error to Display Model Error:
 - If a Two Star Pole Alignment is performed, the Display Model Error will show the Pole Error only.
 - If a Multi-Star (3+ stars) Alignment is performed, the Display Model Error will show the Pole Error, Cone Error together. (**Note:** Multi-Star Alignment has been disabled temporarily for development. It will be enabled in the next release in very near future.)
- The maximum slew speed of iEQ45 Pro has been raised to 6 degree/sec now.
- Improved menu browsing.

Note:

- SkySafari 4 Plus and Pro now work with CEM60 and iEQ45 Pro.

V20141229 Firmware upgrade for HC, main board, R.A. and DEC board

Improvements:

- Communication between RA/DEC and main board has been improved.
- Meridian flip is smoother, and takes less time.
- Search Zero position is faster.

Bug Fixed:

- Sometime guiding via ST-4 Guide Port not working properly.
- Side of Pier not reported correctly. (Need to work with iOptron .NET ASCOM 3.2, which will be released soon).
- When enter the R.A. and DEC coordinates of an object, the DEC sign could not be changed.

V20150112 Firmware upgrade for HC

Updates:

- Comets update which includes those brightest comets in next 3 years.

V20150228 Firmware upgrade for main board and HC

New features:

- Now "Three Star Alignment" is available;
- Added "Clear Alignment Data" function;
- "View Model Error" will display linear RA error, linear DEC error, polar misalignment, non-perpendicular between OTA and DEC, and non-perpendicular between HA and DEC.

Improvements:

- When entering any star catalog menu, it will start where the last object has been chosen;
- Improved One Star Alignment;
- Improved RS233 port communication stability;
- The alignment model error and atmospheric refraction will be applied when go to an object using the hand controller;

- Speed and size were optimized for hand controller firmware.

Bug fixed:

- The hand controller may report incorrect position of Sigma Octantis in the southern hemisphere.

Note:

- The mount will need ASCOM 4.0 to work properly when connected to a computer.

V20150424 Firmware upgrade for RA motor control board and HC

Improvements:

- Greatly improved tracking performance of CEM60-EC;
- Improved Solar System Alignment;
- Greatly reduced waiting time of Polar Iterate Align.

Bug fixed:

- Sometimes One Star Alignment will not work properly;
- RA value of objects in Abell Catalog calculated incorrectly.

V20150505 Firmware upgrade for RA motor control board and HC

Bug fixed:

- Fixed GOTO accuracy after One Star Alignment;
- Corrected the wrong star coordinates in One Star Alignment;
- Fixed EC version tracking bug, especially if no encoder calibration is performed after R.A. firmware upgraded.

V20151016 Firmware upgrade for main board, RA, DEC

V20151018 Firmware upgrade for HC

New features:

- Alignment model will be "remembered" all the time, same as the coordinates. This means if you powered on the mount after a sudden power loss, your pointing accuracy remains the same!
- Alignment model will roam between the hand controller, RS-232 port connection and Wi-Fi connection now. If you want to use any pointing enhancement software, such as T-Point, make sure there is no alignment model in the system!
- Guiding rate of RA and Dec could be set separately now. RA guiding rate could be set from 0.01X to 0.90X sidereal rate, Dec guiding rate could be set from 0.10X to 0.99X sidereal rate.
- Added support for the iOptron Commander 5.0 for Windows and iOptron Commander 1.0 for iOS.

Improvements:

- Sync procedure in hand controller has been reworked.
- User Defined Objects /Comets in hand controller has been reworked.
- More stars have been added into the Named Star list, and now covers 100% stars which are brighter than visual magnitude 3.
- All Named Stars are using the data extracted from UCAC4 or Hipparcos Catalog, instead of the old SAO catalog.
- Chinese Named Star list has been refreshed, now with cross reference to the Named Star.
- Star list used for 1,2 and 3 Star Alignment and Polar Iterate Align has been reworked.
- Comets list updated, now including 15 brightest comets in the next 3 years.

Bug fixed:

- "?" button sometimes do not display correct stars
- LIGHT button sometimes do not work.
- Other bug fixes.

V20160505 Firmware upgrade for HC

V20160520 Firmware upgrade for main board and RA motor control board

New features:

- Parking position now roaming between the HC, Mainboard and PC. Two new parking positions have been added.
- A new option of Altitude Limit is available (applies to both slewing and tracking), which replaces the "Tracking below the horizon".
- The last alignment star could be discarded during the One/Two/Three Star Alignment.

Improvements:

- Coordinates of Constellations have been updated.
- The Binary Star has been renamed to Double/Multi-Star, and has been rebuilt. The new list includes all pairs of stars which both stars are brighter than magnitude 7.0. The data is extracted from UCAC4, Hipparcos and Washington Double Star catalog.
- The alignment star list has been rebuilt, and now sorted by magnitude.
- The algorithm for calculating Polaris or Sigma Octantis has been improved, now matched with iOptron Polar Scope app for iOS.
- The algorithm for calculating stars/stellar objects has been improved.
- Solar System Align have the same interface as One/Two/Three Star Alignment.

Bug fixed:

- The Sync to Target function may not work as expected.
- The mount may not perform well when passes the meridian.
- Some stars in Named Star have incorrect coordinates and/or names.

V20170109 Firmware upgrade for HC

V20161101 Firmware upgrade for main board and RA motor control board

New features:

- Added support for iOptron electric focuser

Improvements:

- Modified the on screen instruction of Polar Iterate Align;
- Expanded User Defined Tracking Speed from [0.9x, 1.1x] to [0.5x, 1.5x];
- Reversed moving direction of Up and Down key in Southern Hemisphere in EQ mode to match the direction of Dec-/Dec+.

Bug fixed:

- Sync do not work as expected when the mount is near some specified region;
- Sometimes the moving speed of 1X and 2X is incorrect in Southern Hemisphere;
- In very rare cases, the mount stopped tracking after a slewing operation;
- Polar Iterate Align failed to work as expected;
- For CEM60-EC, sometimes the calibration routine fails to work;

V20170322 Firmware upgrade for HC

Bug fixed:

- Minor bug fixed.

V20170505 Firmware upgrade for RA

Bug fixed:

- PEC recording bug fixed.

V20190221 Firmware upgrade for HC

V20190424 Firmware upgrade for main board and RA motor control board

Improvements:

- Modified Search Zero Position calibration procedure
- Improvement of CEM60EC performance
- Prevent future GPS rollover bug

Bug fixed:

- One Star Alignment may result different correction in EAST/WEST sky
- Fixed meridian fix bug

Note:

- This version needs ASCOM 5.7.0 to work properly when connected to a computer.

V20190716 Firmware upgrade for main board and RA motor control board

Improvements:

- Improvement of CEM60EC performance under heavy payload

V20190429 Firmware upgrade for HC

New:

- GEM45 added

V20200113 Firmware upgrade for hand controller

Bug fixed:

- Fixed bug that customizing comet causes hand controller frozen.

V20201005 Firmware upgrade for RA motor control board

Improvements:

- Optimized EC/PEC autoguiding algorithm.

Bug fixed:

- Fixed the bug in ST-4 guiding.

V20211018 Firmware upgrade for main and RA/DEC motor control board

V20220119 Firmware upgrade for hand controller

Improvements:

- Maximum slew speed can be set to 256X, 512X and MAX.

Changes:

- Changed AZ Mount Pro auto-calibration selection menu. Now need press ENTER to start auto-calibration
- This version is needed for iOptron Commander 5.9.x.x