

# Version History

## Astro-Physics Command Center (APCC)

### Standard and Pro

*Beginning with version 1.9.0.0, Astro-Physics implemented a one-year renewal subscription plan to provide an upgrade path for all licenses issued more than one year prior to the release date of new versions. Upgrading is optional. All licenses, regardless of age, are eligible for bug fixes and minor updates for features in your license as designated in the release notes below. Please refer to our website for additional information:*

*<https://www.astro-physics.com/apcc>*

#### Version 1.9.7.29 - 12/02/2024 (Pro version)

#### Version 1.9.7.28 - 12/02/2024 (Standard version)

**Important: ASCOM V2 driver 5.60.17 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading from 1.9.6.x or earlier. Your license key and settings will be saved automatically.**

- APCC Pro and Standard - Bug Fix - Safety Park to Alt/Az position was not always working.
- APCC Pro - Bug Fix - APPM would not detect ASTAP plate solve failures that had a Warning message instead of an Error message.

#### Version 1.9.7.27 - 11/17/24 (Pro version)

#### Version 1.9.7.26 - 11/17/24 (Standard version)

**Important: ASCOM V2 driver 5.60.17 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading from 1.9.6.x or earlier. Your license key and settings will be saved automatically.**

- APCC Pro and Standard - APCC now robustly checks the mount's firmware version before allowing APCC to connect.
- APCC Pro and Standard - Bug Fix - Restored logic to check and match computer's Time Zone to the mount's Time Zone (provided Keep mount time synched to PC Time is enabled in APCC's Advanced Settings).
- APCC Pro - Bug Fix - **Don't display images** check box on APPM's **Camera Settings** tab was not working.

#### Version 1.9.7.25 - 10/08/24 (Pro version)

#### Version 1.9.7.24 - 10/08/24 (Standard version)

**Important: ASCOM V2 driver 5.60.17 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading from 1.9.6.x or earlier. Your license key and settings will be saved automatically.**

- APCC Pro and Standard - BUG FIX - Now, when site latitude updates, the new site latitude will update in these windows if they are open: Meridian Limits, Horizon Limits, and 3D Scope.

#### Version 1.9.7.23 - 09/08/24 (Pro version)

**Important: ASCOM V2 driver 5.60.17 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading from 1.9.6.x or earlier. Your license key and settings will be saved automatically.**

- APCC - Site names containing commas are now passed correctly to the ASCOM Driver. ASCOM driver v5.60.17 or later is required to properly decode site names with these characters.
- APCC - Check for and warn the user if the AP V2 ASCOM driver is running before shutting down APCC.
- APCC - Check for and turn off King rate if active.
- APCC - Removed "+" from commands to shorten the length of commands sending degrees, minutes, and seconds. This was causing the set longitude command to fail as the length the command exceeded the maximum length accepted by encoder mounts using the GTOCP3 and AE box.
- APCC Pro - APPM now has an extra digit of precision for Dec and RA spacing, allowing mapping points to be spaced closer together than 1 degree.
- APCC Pro - APPM will no longer continue trying to use the ASCOM camera after switching to another camera type.
- APCC Pro - Instead of using telescope focal length from the ASCOM driver when using the ASCOM camera type, APPM will now insert a calculated focal length into the FITS header calculated from the set image scale in APPM and camera pixel size (from the ASCOM Camera driver). This was done to make it easier to get plate-solving working.
- APCC Pro - APPM will now reject plate solves that return results with RA=0 and Dec=0.

- APCC Pro - APPM includes a indicator when the REST API was not created. This can happen if two instances are run at the same time. The first instance will be able to register the REST API to port 60011, but the second cannot because the port is already allocated. See the screen shot below, which shows that a tool tip with more details will show when hovering the mouse over the indicator.

### **Version 1.9.7.21 - 08/05/24 (Pro version)**

**Important: ASCOM V2 driver 5.60.14 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading from 1.9.6.x or earlier. Your license key and settings will be saved automatically.**

- APCC Pro - APPM - Improve Pause/Restart reliability.
- APCC Pro - APPM - Slow down checks for Image Ready to once every 250 msec. Previously they were happening as fast as possible.
- APCC - Restore pointing and tracking correction states after Homing completes.
- APCC - Increased QAC buffers to 256 from 128 to give APCC more time to recover from CPU resource scarcity.
- APCC - Removed checking of Pointing Model terms that sometimes cause a model to be disabled.

### **Version 1.9.7.19 - 07/01/24 (Pro version)**

**Important: ASCOM V2 driver 5.60.14 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading from 1.9.6.x or earlier. Your license key and settings will be saved automatically.**

- APCC Pro - Fix Encoder status for 3600 mounts.
- APCC Pro - Miscellaneous bug fixes.

### **APCC Pro - Fix Encoder status for 3600Version 1.9.7.17 - 03/19/24 (Pro version)**

**Important: ASCOM V2 driver 5.60.06 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading from 1.9.6.x or earlier. Your license key and settings will be saved automatically.**

- APCC Pro - APPM: made improvements to settings file management and ASCOM FITS headers to prevent issues reported by users.

### **Version 1.9.7.15 - 03/10/24 (Pro version)**

### **Version 1.9.7.14 - 03/10/24 (Standard version)**

**Important: ASCOM V2 driver 5.60.06 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading from 1.9.6.x or earlier. Your license key and settings will be saved automatically.**

- APCC Pro - Bug Fix - APPM Pause/Restart was not working.
- APCC - Bug Fix - Internal Julian Date calculation was in error for some months in some years.
- APCC - Bug Fix - fixed handling of G\_S and G\_E commands from the ASCOM Driver to the GTOCP3 controller.
- APCC - Behavior change: When initializing the mount, using "Don't Unpark" in the "Unpark from" setting will no longer reset to "Last Park Position" after initialization.

### **Version 1.9.7.13 - 01/20/24 (Pro version)**

**Important: ASCOM V2 driver 5.60.06 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading from 1.9.6.x or earlier. Your license key and settings will be saved automatically.**

- APCC Pro - Bug Fix - Pointing and Tracking Rate correction may be incorrectly loaded from APPM after a point mapping run.

### **Version 1.9.7.11 - 01/20/24 (Pro version)**

**Important: ASCOM V2 driver 5.60.06 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading from 1.9.6.x or earlier. Your license key and settings will be saved automatically.**

- APCC Pro - Bug Fix - Pointing and Tracking Rate correction may be incorrectly disabled at start up of APCC.

### **Version 1.9.7.9 - 01/08/24 (Pro version)**

## Version 1.9.7.8 - 01/08/24 (Standard version)

**Important: ASCOM V2 driver 5.60.06 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading from 1.9.6.x or earlier. Your license key and settings will be saved automatically.**

- APCC Pro and Standard - Bug Fix - Fixed handling of ASCOM FindHome method.
- APCC Pro - Don't allow pointing or tracking rate models if RMS error exceeds 500 arc-seconds. This can be adjusted in the settings file "Settings.apcc" only via this setting:  
<PointingModel>  
    <MaximumAllowedRMS>500</MaximumAllowedRMS>  
</PointingModel>
- APCC Pro - APPM - If "Get Real-time RA/Dec" fails, get RightAscension and Declination via the slower, conventional ASCOM properties.
- APCC Pro - APPM - APPM shows last error or warning message to make it easier to notice errors

The screenshot shows the APCC Pro software interface. At the top, there are buttons for 'Pause' and 'Stop', a dropdown menu for 'After Complete:' set to 'Park', and a 'Progress Map' button. Below these is a checkbox for 'Start at specific point' and a spinner box set to '2'. The main part of the interface is a table with the following columns: Num, Time, Side, CW, Hour Angle, and RA. The table contains 7 rows of data. A red arrow points to the bottom of the table, where a warning message is displayed: 'Last error: Point 6 - Warning, remaining image dimensions too low!'. At the bottom of the interface, there are labels for 'Scope: Connected', 'Camera: NASA SkyView (Internet)', and a 'Do' button.

Num	Time	Side	CW	Hour Angle	RA
1	5:14:25 AM	East	Down	-0.200	12.490687
2	5:14:36 AM	East	Down	-2.667	14.960430
3	5:14:59 AM	East	Down	-4.000	16.300113
4	5:15:14 AM	East	Down	-2.667	14.970949
5	5:15:38 AM	East	Down	-1.333	13.644279
6	5:16:27 AM	East	Down	0.000	12.324549
7	5:16:42 AM	East	Down	-4.000	16.328795

Last error: Point 6 - Warning, remaining image dimensions too low!

Scope: Connected Camera: NASA SkyView (Internet) Do

## Version 1.9.7.7 - 12/12/23 (Pro version)

## Version 1.9.7.6 - 12/12/23 (Standard version)

**Important: ASCOM V2 driver 5.60.06 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading from 1.9.6.x or earlier. Your license key and settings will be saved automatically.**

APCC Pro - APPM enhancements:

- Added an image-scale calculator. It is available in the Common Settings group box on the PlateSolve Settings tab.
- If ASCOM camera image data fits in a 16-bit range, APPM will now save ASCOM FITS files in 16-bit integer format, otherwise it saves in the original format (32-bit integer values).
- When using ASCOM Camera option the following keywords are now included in the FITS header file:

**RA** and **OBJCTRA** - Set to the decimal Right Ascension value last retrieved from the AP V2 ASCOM Driver.

**DEC** and **OBJCTDEC** - Set to the decimal Declination value last retrieved from the AP V2 ASCOM Driver.

**FOCALLEN** - Set to the telescope focal length in mm last retrieved from the AP V2 ASCOM driver. This value can be set using the AP V2 Driver ASCOM Setup window.

**APPMVER** - Set to the APPM Version.

**ASCOMCAM** - When an ASCOM camera is used this is set to the name of the ASCOM Camera driver name.

- The **SWCREATE** keyword now is set to "Astro-Physics APPM" instead of "ASCOM Camera Test".

- APCC Pro and Standard - Updated to check for P02-16 firmware and display to the user. [See this section for more details.](#)
- APCC Pro and Standard - Fixed firmware check in trial dialog window.

### **Version 1.9.7.5 - 11/18/23 (Pro version)**

### **Version 1.9.7.4 - 11/18/23 (Standard version)**

**Important: ASCOM V2 driver 5.60.06 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading from 1.9.6.x or earlier. Your license key and settings will be saved automatically.**

- APCC Pro and Standard - Fixed north/south radio button when getting site coordinates from mount in Manage Sites.
- APCC Pro - Updated ASCOM camera's file save orientation in APPM. Although this did not affect platesolved position APPM was saving the image's long-edge vertically instead of horizontally
- APCC Pro - Updated APPM to correctly read and append fits headers as needed, avoid unreadable fits files sent to plate solver
- APCC Pro - Updated APPM to cut the size of ASCOM FITS files by saving image data as 16-bit instead of 32-bit data. The FITS files are now 1/2 the size, which improves the speed of ASCOM camera writes to disk and plate-solver reads of these images.
- APCC Standard - Safety Monitor changes - added option to only log changes and errors to cut down on log writes. Also, three communications errors in a row are required before UnSafe is set to prevent shutdowns from transient conditions. NOTE: This feature is already available in APCC Pro since v1.9.7.3.

### **Version 1.9.7.3 - 10/17/23 (Pro version)**

**Important: ASCOM V2 driver 5.60.06 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading to the new versions. Your license key and settings will be saved automatically.**

#### **Updates and Bug Fixes for all Licenses (fixes listed may apply to licensed features)**

- APCC Pro - Removed comments written to FITS headers as a temporary solution to FITS file corruption. .
- APCC - Safety Monitor changes - added option to only log changes and errors to cut down on log writes. Also, three communications errors in a row are required before UnSafe is set to prevent shutdowns from transient conditions.
- APCC Pro - added new command to enable/disable Dec Arc Tracking (requires license dated to enable Dec Arc tracking).

### **Version 1.9.7.1 - 09/24/23 (Pro version)**

### **Version 1.9.7.0 - 09/24/23 (Standard version)**

**Important: ASCOM V2 driver 5.60.06 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading to the new versions. Your license key and settings will be saved automatically.**

#### **Updates and Bug Fixes for all Licenses (fixes listed may apply to licensed features)**

- APCC - If a temperature below -100C is passed from an ASCOM Observing Conditions driver, APCC will fall back to the user settable temperature control on the Pointing Model tab.
- APCC - Added support for driver getting site settings from APCC (AP V2 ASCOM driver 5.60.06 or later is required).
- APCC - Allow processing of additional GPS message types. Supported messages: \$GPGGA, \$GNGGA, \$GLGGA, and \$GAGGA
- APCC Pro - APPM has a new option to not display ASCOM images, which will speed mapping runs.

**The following new features are only available with APCC licenses or renewals dated 09-01-2022 (Sept. 1, 2022) or later:**

- APCC - ASCOM Safety Monitor support. An action (Park, Home, stop tracking, or Warn) can be configured when an ASCOM Safety Monitor indicates outdoor conditions are unsafe (e.g. rain, wind, etc.).
- APCC Pro - Points near the zenith can be excluded in APPM with the new Max Altitude settings.
- APCC Pro - Atlas sky database in DC Dreams PinPoint 7.

### **Version 1.9.6.7 – 02-03-23 (Release – Pro Version)**

## **Version 1.9.6.6 – 01-03-23 (Release – Standard Version)**

**Important: ASCOM V2 driver 5.60.04 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading to the new versions. Your license key and settings will be saved automatically.**

### **Updates and Bug Fixes for all Licenses**

- APCC - Query mount status immediately after a park operation completes to update park status and satisfy NINA and ASCOM desired behaviors.

## **Version 1.9.6.5 - 01/23/23 (Pro version)**

### **Version 1.9.6.4 - (Standard version)**

**Important: ASCOM V2 driver 5.60.03 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading to the new versions. Your license key and settings will be saved automatically.**

### **Updates and Bug Fixes for all Licenses**

- APCC - Keep slewing status active during entire park operations to satisfy NINA and ASCOM desired behaviors.
- APCC - Keep polling once a second for mount latitude/longitude until the mount responds.
- APCC - Save and restore the View South checkbox between APCC runs.
- APCC Pro - Restrict range of Dec Arc Tracking to within min and max declination.

## **Version 1.9.6.3 - 01/05/23 (Pro version)**

### **Version 1.9.6.2 - (Standard version)**

**Important: ASCOM V2 driver 5.60.02 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading to the new versions. Your license key and settings will be saved automatically.**

### **Updates and Bug Fixes for all Licenses**

- APCC - Improved handling of ASCOM SetPark command.

## **Version 1.9.6.1 – 01-02-23 (Release – Pro Version)**

### **Version 1.9.6.0 – 01-02-23 (Release – Standard Version)**

**Important: ASCOM V2 driver 5.60.02 or later is required. Uninstall prior versions of the V2 driver and APCC before upgrading to the new versions. Your license key and settings will be saved automatically.**

### **New Features - requires license dated 01-01-22 or later**

- APCC Pro – Added “Plate Solve, Autocenter” button to Move Scope group box to launch APPM, Plate Solve and Autocenter. Also available from the Tools Menu.
- APCC – Ability to disable the prompt to confirm park

### **Updates and Bug Fixes for all Licenses**

- APCC - Minor user interface changes.
- APCC - APCC now controls park and unpark positions rather than the driver.
- APCC - Changed units for sidereal rate value from sec/hr to sidereal.
- APCC - Changed how APCC gets the driver mode (REST or Virtual Ports).
- APCC - Limited Virtual COM port maximum to COM99 to prevent issues with 3<sup>rd</sup> party software.
- APCC - Restricted guide rates to 1.00x.
- APCC - Removed “Exhaustive Port Search” in Advanced settings. Now part of “Find Mounts” button when in USB/Serial mode.
- APCC - Removed the search for network mounts and refresh com port list buttons. Added new "Find Mount" button that can search for the mount. Also, "Connect" mount will auto-find the mount if "None" is selected.
- APCC - Updated default values for controls.

- APCC - Keep the "Park" button enabled even when the mount is parked. This will allow the user to park to another position without having to unpark first.
- APCC - Updated commands sent to reconfigure the AP V2 ASCOM driver.
- APCC - Warns the user if there is a version earlier than ASCOM Platform 6.6SP1 installed.
- APCC - Added the DefaultSettings.apcc file, tested and fixed a few issues.
- APCC - Removed GuideRate from status bar.
- APCC - Added units to RA and Dec tracking rates in the status bar of the main window.
- APCC - Added new check box to clear all previous errors when APCC starts or is connected to the mount.
- APCC - The Metric check box in the "Manage Sites" window, which is used to select Meters and Celsius scales (or Feet and Fahrenheit) is now linked with the "Meters" check box on the "Site" tab. Changing one will change the other. Note that now you cannot display Meters and Fahrenheit values simultaneously. That is you can select Meters and Celsius -or- Feet and Fahrenheit scales.
- APCC - RA and Dec Encoder warnings are shown only once after three consecutive warnings and will not show again unless disconnected and reconnected to the mount. Warnings are still written to the log file.
- APCC - The "Rate Units" selected on APCC's "Rate Settings" tab will now be used in APCC's status bar.
- APCC - In the ASCOM Driver tab of "Advanced Settings", there is a new control to specify the minimum virtual port number that APCC will use. The default is 30, which means the lowest COM port APCC will use for a virtual port is COM30.
- APCC - Slew rate list is remembered when restarted, even when the mount is not connected.
- APCC - Removed button to connect to the ASCOM driver and checkbox option to Auto-Connect the driver which is no longer supported. The "Now" button is now larger and is renamed to "Config Driver."
- APCC - Installer defaults to use REST API for new users. This will not install Eltima Virtual Ports unless the user selects the option to do so.
- APCC - Detects when the Eltima Virtual Ports are not installed or not working and switches the driver to use REST API if not already selected. Also, the Eltima Virtual Ports option will be disabled in the ASCOM tab in the Advanced Settings window.
- APCC – Assembled a file of the best universal default values for general usage. These default values do NOT include your user-specific values like location data, but they do reset all the general operational values to their defaults. User specific parameters are not overwritten, and therefore are not lost. The file lives at C:\ProgramData\Astro-Physics\APCC\DefaultSettings.apcc.
- APCC - Added "Purge Logs" option in Advanced Settings.
- APCC - Added "Reset All Defaults" button in Advanced Settings.
- APCC - Removed "Windows Priority" combo box in Advanced Settings.
- APCC - Added "Set Constant Limit" to Meridian Tracking Limits Explorer window.
- APCC - Removed "Stop Tracking after unparking" check box from the Park tab.
- APCC - Counterweight-up parks are now allowed.
- APCC - Removed "Create Virtual Ports First" check box in the Mount connection group box.
- APCC - Removed AP V2 Driver group box's "Auto-Config" check box.
- APCC - Change Advanced setting tab's name from "API" to "ASCOM Driver".
- APCC - In Advanced settings "ASCOM Driver" tab, change to use radio buttons select "Eltima Virtual Ports" or "REST API". When 'REST API' is selected, the Virtual Port tab and four status boxes at the bottom of APCC are removed and "REST API" shows in the status bar.
- APCC - Added "Fixed Limit" check box and horizon Altitude settings in APCC's Horizons tab.
- APCC - Fixed the refresh of controls when APCC is resized.
- APCC - Fixed auto-shutdown when the driver is using REST to communicate with APCC. It activates the shutdown countdown when the driver disappears from Windows process list.
- APCC - Fixed "Status" window's combo box for button rates to match APCC's those "Move Scope" group box.
- APCC - Fixed RA and Dec tracking rates displayed in the Status window.
- APCC - Fixed slew rates shown for the 3600GTO when GTOCP4 P02-15 or later firmware is in use.
- APCC - Horizons - Fixed tracking rates in the "Test Tracking" mode.
- APCC - Horizons - Change NASA Horizons link to use https instead of http.
- APCC Pro - Changed wording of PNT files to "Active Point Map".



- APCC Pro - Changed wording when prompting user to load a map at the end of a mapping run.
- APCC Pro - AE Homing can be canceled by clicking the homing status window:
- APCC Pro - Show "Dec Arc" instead of "Rate Corr" in the tracking correction status label when the Dec Arc Tracking algorithm is being used.
- APCC Pro - The displayed RA rate units is now Arc-sec/hour in the "Tracking Correction Status" group box on the "Pointing Model" tab. Hovering the mouse over the box will show the old value (Sec/hour).
- APCC Pro - On the "Pointing Model" tab, moved "Correct for Refraction" check box to the "Operation" group box.
- APCC Pro - On the "Pointing Model" tab, removed check boxes and pointing terms and replaced with scatter plots of East and West pointing models.
- APCC Pro - The APPM "Test Solve" folder window now allows copy/paste of its entire table.
- APCC Pro - APPM shows a checkbox for RECAL (instead of the two buttons) even if the user does not have a subscription which includes the Recenter checkbox.
- APCC - APPM - Add additional information to FITS header, including when an image has been dark-subtracted.
- APCC Pro - APPM - Increased NASA Sky View image size from 1600x1200 to 2400x1600 to include more stars for plate solving.
- APCC Pro - Fixed the issue when NINA connect failed, which allowed a user to continue a mapping run with NINA not connected.
- APCC Pro - Fixed missing help link for AE tab.
- APCC Pro - Fixed reversed buttons when canceling the Home operation.

### **Version 1.9.4.3 - 02/27/2022 (Release - Pro version)**

### **Version 1.9.4.2 - 02/27/2022 (Release - Standard version)**

**NOTE: AP V2 ASCOM Driver version 5.50.02 or later is required for proper operation.**

- APCC - Allow upper or lower case "M" for units (meters) from MGBBoxV2 ASCOM drivers.
- APCC - Fixed connect to AP V2 driver from APCC.
- APCC Pro - for APCC's GPS tab, added internal check for new MGBBoxV2 ASCOM server. Of found it will be used instead of the older driver.
- APCC Pro - added REST API command that allows external applications, such as the ASCOM driver, to send native mount commands and receive responses. This is an alternative to using APCC's Virtual Ports for communication.

### **Version 1.9.3.3 - 01/20/2022 (Release - Pro version)**

- APCC Pro - Fixed bug in APPM Trial mode that prevented use of ASTAP.
- APCC Pro - Fixed bad pointing and tracking rate correction when the model's PNT file was missing.

### **Version 1.9.3.1 - 12/26/2021 (Release - Pro version)**

### **Version 1.9.3.0 - 12/26/2021 (Release - Standard version)**

#### **New Features - requires license dated 08-01-20 or later**

- APCC Pro - APPM - Add check box to ASTAP plate solve configuration to use FITS header for RA, Dec, and image scale.
- APCC Pro - Further improve performance of Real-time RA/Dec.

#### **Updates and Bug Fixes for all Licenses**

- APCC - Eltima V10 is incompatible with Windows 7, so the installer will install Eltima V9 for Windows 7.
- APCC - Upgraded Eltima Virtual Serial Ports ActiveX to version 10.
- APCC - Report encoder error only if three or more read errors occur in a row.
- APCC - Provide additional time offset for meridian flip point for Sequence Generator Pro users.
- APCC - Log user double-clicks to status bar.
- APCC - The NASA Horizons website has been revamped so copying/pasting the website data no longer works. Horizons now accepts an ephemeris file downloaded from the new NASA Horizons web site.

- APCC - Fixed - Horizons now accepts JPL NASA ephemeris files with refraction model set to "standard atmospheric model".
- APCC Pro - Fixed a bug in the ASCOM camera view window.
- APCC Pro - Updated MappingRun/Status REST API to use numeric instead of text values for certain properties.
- APCC Pro - Fix potential issue with Error Log window not showing when APCC is minimized.
- APCC Pro - Any calculated pointing term that exceeds a predetermined maximum value is set to 0 to prevent huge over-corrections when using the all-sky pointing models.
- APCC Pro - The 3D View now follows the Mach 2 position even when declutched.
- APCC Pro - APPM - Added new REST API commands to close APPM from an external application.
- APCC Pro - APPM - Added new REST API commands to start, stop, and get status of APPM mapping runs.
- APCC Pro - APPM - Added new REST API commands to get/set **Measurement Points** tab values.
- APCC Pro - APPM - Add new command line switch (-M) to accept configuration on the Measurement Points tab.
- APCC Pro - APPM - Fixed - The -M option was not parsing some values to double precision floating point.
- APCC Pro - APPM - Fixed - Binned full-frame images passed the wrong width and height to the ASCOM Camera driver.

### **Version 1.9.0.11 – 09-23-21 (Release – Pro version)**

- APCC Pro – Fixed – Realtime RA/Dec feature (Pro licenses dated August 1, 2020 or later).

### **Version 1.9.0.9 – 09/20/21 (Release – Pro version)**

- APCC Pro - Updates the ServiceStack component's license (used by the REST API), which was out of date. I updated it on APPM but forgot to update it on APCC. :-(
- APCC Pro - Improves the response time of the real-time RA/Dec command, which was sometimes timing out with Brent Boshart's satellite tracking program.
- APCC Pro - APPM can now use the real-time RA/Dec if the user has a license dated August 1, 2020, or later. This cuts down APPM's slew time between points by up to two seconds as it will no longer be reading cached RA/Dec values from the driver (up to 1-sec delay) and APCC (up to another 1-sec delay).

### **Version 1.9.0.7 – 09/14/21 (Release – Pro version)**

- APCC Pro - Fixed - APCC can once again launch APPM and plate-solve+RCAL to the configured equipment. This was failing because of an incompatibility between different versions of the REST API component that APCC and APPM use to communicate with each other and NINA and SGPro. Also, APPM was not pushing error messages back to APCC if the plate-solve failed. That has been fixed.
- APCC Pro - Fixed - there was a sign error in two cases adding external declination rates from the ASCOM driver.

### **Version 1.9.0.5a – 09/07/21 (Release – Pro version)**

- APCC Pro – Fixed – Restore missing DLL from Pro

### **Version 1.9.0.5 – 9/06/21 (Release - Pro version)**

### **Version 1.9.0.4 – 9/06/21 (Release - Standard version)**

- APCC - Fixed - APCC did not send meridian limit value to Sequence Generator Pro.
- APCC - Fixed - backup COM port value did not save when set to "None".
- APCC - Fixed - trial license did not enable latest subscription features.
- APCC Pro - Fixed - MoveAxis commands were disabled when Dec >= 80 or Dec <= -80 degrees.
- APCC Pro - Fixed - Dec-Arc check box did not save.
- APCC Pro - Fixed - APPM did not allow non-standard spaces in OBJECTRA and OBJECTDEC FITS header keyword values.
- APCC Pro - Fixed - ASTAP results in APPM did not work with FITS files with extensions other than ".FIT".

### **Version 1.9.0.1 – 8/01/21 (Release - Pro version)**



## **Version 1.9.0.0 – 8/01/21 (Release - Standard version)**

### **New Features - requires license dated 08-01-2020 or later**

- APCC Pro - Declination-Arc tracking algorithm. This new algorithm is an alternative to the normal all sky tracking model that APCC Pro uses.
- APCC Pro - APPM can use ASTAP for plate-solving.
- APCC Pro - APPM can use NINA for camera control.
- APCC Pro - For third-party satellite trackers, real-time RA/Dec can be returned using the :GRGD# command.

### **Updates and Bug Fixes for all Licenses**

- APCC Pro - Added command line option to APPM to use a startup settings file.
- APCC - Updated to Eltima V9.0 Drivers. Changes/fixes to the Eltima drivers include:
  - Added: Windows Server 2016 support.
  - Added: full Windows 10 support.
  - Improved: displaying a more detailed information about the virtual serial ports in Windows Device Manager.
  - Improved: drivers are digitally signed with WHQL.
  - Fixed: displaying of the newly created virtual ports in the device manager.
  - Fixed: timeouts processing during the read operation.
- APCC - Added King rate as a new tracking rate (requires GTOCP4/CP5).
- APCC - Meridian limits tab includes a title of the last meridian limits file saved or loaded.
- APCC - BUG FIX - Component One License dialog was coming up on a **Horizons** tracking graph window.
- APCC - BUG FIX - When parking to a location "under" the celestial pole, APCC was setting an incorrect meridian delay, causing the mount to slew the wrong way.
- APCC - BUG FIX - APCC was removing "X/Y/Z" characters from the response to :GOS# command.

## **Version 1.8.8.17 - 01/22/2021 (Release - Pro version only)**

- APCC Pro - Handle race condition between Horizon/Meridian Limits stop tracking and updating the modeled tracking rate.

## **Version 1.8.8.15 - 01/15/2021 (Release - Pro version)**

### **Version 1.8.8.14 - 01/16/2021 (Release - Standard version)**

- APCC - Use an alternative method to perform "check for updates".
- APCC - WiFi Mac address now displays correctly in Find GTOCP4/5.

## **Version 1.8.8.15 - 01/15/2021 (Release - Pro version only)**

- APCC Pro - Try alternative method to perform "check for updates".
- APCC Pro - WiFi Mac address now displays correctly in Find GTOCP4/5.

## **Version 1.8.8.13 - 01/03/2021 (Release - Pro version only)**

- APCC Pro - Change default settings for check box options.
- APCC Pro - Latitude and Longitude now display with N/S and E/W symbols, respectively, instead of positive/negative values.

## **Version 1.8.8.11 - 12/26/2020 (Release - Pro version only)**

- APCC Pro - Bug Fix - Fix the slow start up issue.

## **Version 1.8.8.9 - 12/19/2020 (Release - Pro version only)**

- APCC Pro - Bug Fix - Fix licensing issue with chart component.

## **Version 1.8.8.5 - 12/12/2020 (Release - Pro version only)**

- APCC Pro - Bug Fix - RA and Dec values in APPM log files sometimes had incorrect HH:MM:SS, and DD:MM:SS values, respectively.

## **Version 1.8.8.3 - 11/10/2020 (Release - Pro version only)**

- APCC Pro - Bug Fix - APPM was opening a new window for every ASCOM camera operation.

## **Version 1.8.8.0/1 - 11/08/2020 (Release - Standard/Pro versions)**

- APCC - Bug Fix - APCC was not parking the Mach2 correctly to Home position.
- APCC - Bug Fix - When comparing mount time to computer time, Date/Time was not always initialized properly, thus incorrectly reporting mount time was more than 2 seconds from computer time.
- APCC - Bug Fix - Under certain conditions it was possible to set the meridian inclination value out of the valid range of 0-180 degrees. This resulted in an application exception.
- APCC - Bug Fix - The command ":m#" was being sent to firmware versions that don't recognize this command. This command now is sent only to mounts with firmware P02-05 and later.
- APCC - Internal mount limits are now disabled for mounts with P02-05 and later firmware.
- APCC - Add new commands to set Virtual Port output RA and Dec precision from external applications.
- APCC - now displays "Connected" in the pop-up window, which then will close more quickly than previous versions.
- APCC Pro - APPM - Add up to 15 second delay above settle time if mount is not at the target coordinates when collecting data points for a model.

### **Version 1.8.7.0/1 - 10/04/2020 (Release - Standard/Pro versions)**

- APCC - Bug Fix - APCC was erroneously sending a command that is unrecognized by firmware versions before P02-05.

### **Version 1.8.6.0/1 - 08/24/2020 (Release - Standard/Pro versions)**

- APCC - Re-initialize encoder ranges when RA or Dec Encoder limits are enabled.

### **Version 1.8.5.1 - 08/23/2020 (Release - Pro version only)**

- APCC Pro - For Mach 2 and other encoder equipped mounts, turn off mount's internal RA and Dec limits.
- APCC Pro - Initialize Encoder Limits every time APCC connects to the mount.

### **Version 1.8.4.1 - 07/26/2020 (Release - Pro version only)**

- APCC - BUG Fix - On the **Goto/Recal** tab declination values greater than 90 degrees could be entered under the right circumstances.
- APCC Pro - BUG Fix - Point counts on the top of the **Pointing Model** tab were not getting set.
- APPM - Improvement - Manually add DATE-OBS keyword to ASCOM FITS images.

### **Version 1.8.3.0/1 - 05/31/2020 (Release - Standard/Pro versions)**

- APCC - BUG Fix - Because of a rare race condition a Meridian flip might not occur when it should have.
- APCC - BUG Fix - Turning off Slews within West Meridian limits did not reset the meridian delay.
- APCC Pro - BUG Fix - APPM Camera errors were sometimes ignored.

### **Version 1.8.2.0/1 - 05/25/2020 (Release - Standard/Pro versions)**

- APCC - BUG Fix - Tracking rates were not working correctly for the GTOCP3 in 1.8.1.1.
- APCC - BUG FIX - Prevent Mach 2 from setting HOME to be anything other than Park 3.
- APCC - BUG FIX - The ASCOM driver can send values in exponential notation when the value is near zero. APCC was rejecting this exponential notation.
- APCC - BUG Fix - Commands starting with "G\_" were rejected.
- APCC - BUG Fix - Clear flashing scope view when user clears all errors.
- APCC - BUG FIX - Settings were not always being correctly saved.
- APCC - BUG Fix - Prevent possible overflow in Meridian Limits Add Point dialog.
- APCC - BUG FIX - Horizons - some of the menus did nothing.
- APCC - BUG FIX - Horizons - Fixed a number of display bugs and made the displayed data more useful.

- APCC - BUG Fix - fixed an integer overflow error that would happen occasionally.
- APCC Pro - BUG FIX - APPM - Slew would sometimes fail to appear to complete thus stalling data mapping runs.
- APCC Pro - BUG Fix - tracking rate correction was not always saved correctly.
- APCC - Improvement - Moved virtual port handlers to their own threads to reduce latency when user interface elements are updated.
- APCC - Improvement - In the Meridian Tracking Limits Explorer dialog window, add a button to update Meridian Inclination.

#### **Version 1.8.1.0/1 - 04/07/2020 (Release - Standard/Pro versions)**

- APCC - Warn user if CP4 firmware is older than VCP4-P01-13.
- APCC - BUG FIX - Horizon Limit could sometimes use excessive CPU cycles.
- APCC - BUG FIX - 1600 mounts with GTOCP3 and encoders would not display the AE tab.
- APCC Pro - BUG FIX - ASCOM RA tracking rates were inverted.
- APCC Pro - BUG FIX - Fixed math sign for all user interface RA and Dec rate values.
- APCC Pro - Improved precision of tracking rates.

#### **Version 1.8.0.8/9 - 03/07/2020 (Release - Standard/Pro versions)**

- APCC - BUG FIX - Fix meridian limit flip offset value.
- APCC - BUG FIX - Not all centering rates were available for earlier versions of firmware.
- APCC - BUG FIX - Pressing Control-Key on start did not override saved window positions.
- APCC - BUG FIX - The "*Use numerical IP address*" checkbox in the Find GTOCP4/GTOCP5 window was not saved/restored.

#### **Version 1.8.0.7- 03/07/2020 (Beta - Pro version)**

- APCC Pro - Allow APPM to use camera binnings other than 1x with SGPro.

#### **Version 1.8.0.4/5 - 03/07/2020 (Release - Standard/Pro versions)**

- APCC - BUG FIX - AE tab values are not populated or updated.
- APCC - BUG FIX - Custom slew rate option was missing in Rates tab and Initialization windows.
- APCC - Restored Encoder Trim controls to ELS tab.
- APCC - Disable Encoder enable/disable switch for Mach 2/GTOCP5.

#### **Version 1.8.0.2/3 - 02/29/2020 (Release - Standard/Pro versions)**

- APCC - BUG FIX - clicking AE tab can cause it to switch to ELS tab.
- APCC - Limit Safety Park position option if the control box does not have the appropriate firmware CP4 version P02-02 or later.
- APCC - Updated documentation for APPM and Virtual Port and Park tabs.

#### **Version 1.8.0.0/1 - 02/27/2020 (Release - Standard/Pro versions)**

- APCC - Added support for GTOCP5 and Mach 2.
- APCC - Added Safety park to park positions. (Requires CP4 version P02-02 or later)
- APCC - Allow custom Alt/Az parks to negative altitudes and to counterweight up positions.
- APCC - Fix various slew and park issues.
- APCC Pro - Fix issues with plate solving NASA SkyView camera type.
- APCC Pro - In APPM improve information presented when manual plate solving and plate solve+RECAL.
- APCC Pro - Made improvements to APPM user interface.

#### **Version 1.7.1.4/5 - 11/29/2019 (Release - Standard/Pro versions)**

- APCC - BUG FIX - Mount flip does not complete when meridian limit is reached and flip mount is the selected action.

#### **Version 1.7.1.3 - 09/29/2019 (Release - Pro version)**

#### **Version 1.7.1.2 - 09/29/2019 (Release - Standard version)**

- APCC Pro only - BUG FIX - Upgrade from Standard license was not working.
- APCC Pro only - BUG FIX - Refraction checkbox option was not saved.

- APCC Pro only - BUG Fix - Final correction slew might not appear to complete if a response from the mount is not received.
- APCC Pro and Standard - miscellaneous bug fixes and improvements.

#### **Version 1.7.1.1 - 03/14/2019 (Release - Pro version)**

#### **Version 1.7.1.0 - 03/14/2019 (Release - Standard version)**

- Relabeled 1.7.0.28/29 to released status!

#### **Version 1.7.0.29 - 03/07/2019 (Beta Release - Pro version)**

#### **Version 1.7.0.28 - 03/07/2019 (Beta Release - Standard version)**

- APCC Pro and Standard - Added Camera rotation parameter to 3D Telescope Editor.
- APCC Pro - A couple buttons in the Pointing model window were shifting position after the window opened.
- APCC Pro - Tracking rate correction commands were being overridden by a command from the ASCOM driver.

#### **Version 1.7.0.27 - 02/22/2019 (Beta Release - Pro version)**

#### **Version 1.7.0.26 - 02/22/2019 (Beta Release - Standard version)**

- APCC Pro and Standard - Unsafe Slew moves were not always being honored.
- APCC Pro - fixed flip flop slew to counterweight up position when using APPM with counterweight-up slews.
- APCC Pro - APPM removed extra slew when settling.
- APCC Pro - APPM toggling between Decimal and HH:MM:SS/DD:MM:SS formats works much better.
- APCC Pro - APPM 5x Verify now only does a RECAL on the first iteration.
- APCC Pro - APPM fixed several cross-threading exceptions.
- APCC Pro - Improved tool tips when hovering over graphs in Pointing Model window.

#### **Version 1.7.0.25 - 02/14/2019 (Beta Release - Pro version)**

#### **Version 1.7.0.24 - 02/14/2019 (Beta Release - Standard version)**

- APCC Pro and Standard - Fixes to handle edge and start up Meridian Limits conditions.
- APCC Pro and Standard - State of **Limit to Meridian** check box on Meridian Limits tab was not being restored when APCC restarted.

#### **Version 1.7.0.25 - 02/14/2019 (Beta Release - Pro version)**

#### **Version 1.7.0.24 - 02/14/2019 (Beta Release - Standard version)**

- APCC Pro and Standard - Fixes to handle edge and start up Meridian Limits conditions.
- APCC Pro and Standard - State of **Limit to Meridian** check box on Meridian Limits tab was not being restored when APCC restarted.

#### **Version 1.7.0.23 - 02/13/2019 (Beta Release - Pro version)**

#### **Version 1.7.0.22 - 02/13/2019 (Beta Release - Standard version)**

- APCC Pro only - Improvements to tool tips in pointing model graphs.
- APCC Pro and Standard - GPS tab now supports reading GPS information from the **MGBBoxV2** from Astromi.ch.
- APCC Pro and Standard - Improved formatting of Latitude and Longitude

#### **Version 1.7.0.21 - 02/07/2019 (Beta Release - Pro version only)**

- APCC Pro - BUG FIX - UDP IP Address now works without needing to provide a port number.
- APCC Pro - Tracking correction now sends an updated tracking rate when the rate actually changes instead of always sending once per second.

#### **Version 1.7.0.19 - 02/06/2019 (Beta Release - Pro version only)**

- APCC Pro - BUG FIX - Tracking rates were inverted after removing relative moves in 1.7.0.17.

#### **Version 1.7.0.17 - 02/05/2019 (Beta Release - Pro version only)**

- APPM - Replaced HA/Dec slews with RA/Dec slews. The HA/Dec slews were adding a slight amount of positional error.

#### **Version 1.7.0.15 - 02/04/2019 (Beta Release - Pro version)**

#### **Version 1.7.0.14 - 02/04/2019 (Beta Release - Standard version)**

- APCC Pro and Standard - BUG FIX - Meridian delay was getting reset under certain circumstances which sometimes prevented counterweight up slews (same as Standard).
- APCC Pro and Standard - BUG FIX - Fixed cross-threading issue that might prevent the Mechanical Home position from being correctly displayed

### **Version 1.7.0.13 - 01/28/2019 (Beta Release - Pro version only)**

- APCC - BUG FIX - On the AE tab clicking Cancel in **Configure Home** would pop up an error and still start up APPM.
- APCC - BUG Fix - The **Enable Refraction** option was not being saved.
- APPM - BUG Fix - West pier side counterweight-up slews were slewing to the opposite side then back.
- APPM - BUG Fix - Reset RA/Dec plate solve offsets when restarting a new run.
- APPM - BUG Fix - Getting a NASA SkyView image would always fail the first time.
- APCC - BUG Fix - Pier flip would not happen under certain circumstances because of the difference between the pointing model's Right Ascension value and the mount's actual Right Ascension.
- APCC - Bug Fix - Fixed several bugs that sometimes would result in inaccurate pointing corrections.

### **Version 1.7.0.11 - 01/11/2019 (Beta Release - Pro version only)**

- APPM - BUG Fix - West pier side counterweight-up slews were slewing to the opposite side then back.
- APPM - Reset RA/Dec plate solve offsets when restarting.

### **Version 1.7.0.10 - 01/11/2019 (Beta Release - Pro + Standard version)**

- APCC - Implemented new meridian limits operations to copy "East to West" and "West to East" data points.
- APCC - Various bug fixes.

### **Version 1.7.0.9 - 01/09/2019 (Beta Release - Pro version only)**

- APCC - BUG Fix - Fixed calculation of RA/Dec error when refraction is enabled/disabled.

### **Version 1.7.0.7 - 01/08/2019 (Beta Release - Pro version only)**

- APCC - BUG Fix - Fixed sign of Southern Hemisphere RA movements.
- APCC - BUG FIX - "Emergency Stop" was not stopping motions caused by RR and RD commands.

### **Version 1.7.0.5 - 01/07/2019 (Beta Release - Pro version only)**

- APCC - Totally reworked the pointing model functionality for improved pointing and tracking rate correction.
- APCC - Improved accuracy of Sidereal Time calculation, which is important to the accuracy of the pointing model.
- APCC - Fixed a refraction calculation bug in the model.
- APCC - In the Pointing Model window, added buttons to select all mapping points.
- APCC - Fixed several bugs in the pointing model window.
- APPM - Fixed a bug related to the hour angle/dec slews.'
- APPM - Added "automap" command line switch to start an automated APPM run.
- APPM - BUG FIX - when selecting certain Point Ordering Strategy values, the appropriate controls were not always enabled.
- APPM - added command line switches to load a previously saved settings file and a custom point list.

### **Version 1.7.0.3 - 12/2/2018 (Beta Release - Pro version only)**

- APPM - Changed slew to use Hour Angle/Dec commands.
- APCC - Added refraction coefficient back in.
- APCC - Added new Pointing model graphs to map the relationships between pointing errors and position in the sky. The graphs have features like zooming in and out to get a better view of the data in the graphs.
- APCC - Added filters to remove potentially bad data points from the pointing model.
- APCC - In the pointing model window hovering over a point in the graphs will automatically show and select its entry in the table. Also a popup window will show some details about the point that is being hovered over.
- APCC - Selecting a row in the pointing model table will highlight the corresponding point in the pointing error graph.

### **Version 1.7.0.1 - 10/27/2018 (Beta Release - Pro version only)**

- APPM - Added Environment group box for ASCOM ObservingConditions Driver
- APPM - Keep appropriate camera and plate solve settings enabled during plate solving so they can be adjusted while running.
- APPM - Add new option to use last plate solve error offset to the next plate solve's hint. This usually speeds up plate solves.
- APPM - Add robustness to PinPoint Remote Server setup.
- APPM - Various other bug fixes.
- APPM - Add "Declination (Graduated RA Density)" point ordering strategy.
- APPM - Add quick "Map Type" selection.
- APPM - GTOCP4 counterweight-up slews no longer slew to meridian and back to destination ("safe slews").
- APCC - AE (encoder) tab added. Features include define and find Home, define fixed and variable RA limits, define fixed Dec Limits, enable/disable encoders.

### **Version 1.7.0.0 - 10/27/2018 (Beta Release - Pro + Standard version)**

- APCC - Add new Environmental Settings settings to select ASCOM ObservingConditions driver or THUM device.
- APCC - Meridian Limits - Added Flip Offset and Limit to Meridian controls. The Flip Offset value allows the mount to flip during a period of time before the meridian limit is reached.
- APCC - Meridian Limits - Allow a negative meridian flip point to be passed to Sequence Generator Pro.
- APCC - Meridian Limit Editor - Automatically disable Meridian Limits when in the editor. This can cause unintentional meridian flips.
- APCC - Site Information tab now includes the site's Time Offset from UTC, including any offset from Daylight Savings Time when
- APCC - AE (encoder) tab added. Features include define and find Home, define fixed and variable RA limits, define fixed Dec Limits, enable/disable encoders.

### **Version 1.6.0.4 - 08/03/2017 (Public Release - Standard version only)**

**Note: This version must be used with the AP V2 ASCOM driver v5.10.00 or later.**

- APCC Standard - enable RA/Dec limits checking for Standard version.

### **Version 1.6.0.3 - 07/27/2017 (Public Release)**

**Note: This version must be used with the AP V2 ASCOM driver v5.10.00 or later.**

- APCC Pro - Fix formatting of extended precision response to GR commands with the pointing correction enabled.
- APCC - Aborting Pier Flip would not restore original meridian delay.
- APCC - Removed all "blocking" message box windows. All pop up windows will automatically close with a default action. All actions are recorded in the log file.
- APCC - Status of a canceled slew was not always propagated up to the driver, so the driver would think the slew was still active.
- APCC - Only send commands to Sequence Generator if it is running.
- APCC - Fix UDP backup to COM port not working.

### **Version 1.6.0.2 - 07/17/2017 (Public Release)**

**Note: This version should be used with the AP V2 ASCOM driver v5.10.00 or later.**

- APCC - some commands were mistakenly sent to the GTOCP3 with extended precision.

### **Version 1.6.0.1 - 07/14/2017 (Public Release)**

**Note: This version should be used with the AP V2 ASCOM driver v5.10.00 or later.**

- APCC - Fix problem with main window scaling for high DPI monitors and laptops.

### **Version 1.6.0.0 - 07/12/2017 (Public Release)**



**Note: This version should be used with the AP V2 ASCOM driver v5.10.00 or later.**

- APCC - Do not use extended precision format for GTOCP3 controllers. (GTOCP4 firmware "P01-04" and later will use extended precision).
- APCC - Allow RA/Dec move rates up to 999.999x for GTOCP3 firmware "V1" and all GTOCP4 controllers.
- APCC - Improve performance over remote connections by decoupling many controls in the user interface from virtual port commands.
- APCC - Added missing J2000/JNow conversions for Sync. Fixed a few other bugs related to J2000/JNow conversion.
- APPM - Many improvements and bug fixes.

### **Version 1.5.1.1 - 06/06/2017 (Private Release)**

**Note: This version should be used with the AP V2 ASCOM driver v5.09.10 or later.**

- APCC - Fixed qualification of high precision formatted RA/Dec/Alt/Az commands coming in through the virtual ports.
- APCC - Made changes to reduce slow UI updates (e.g. over Remote desktop) from delaying responses to commands received on virtual ports.

### **Version 1.5.1.0 - 06/04/2017 (Private Release)**

**Note: This version should be used with the AP V2 ASCOM driver v5.09.10 or later.**

- APCC - All versions of CP3 "V" chip and CP4 "P01-04" and later now will send higher precision values to the mount for these commands:
- :Sr, :Sh, :Sd, :Sz, :Sa, :St, and :SM
- APCC - Increased display resolution of RA/Dec/Alt/Az/HA in various places.
- APCC - Changed behavior of RA/Dec and Alt/Az Save/Restore functionality on the Goto/Recal tab.
- APCC Pro - Pass point model's corrected alt/az position to the driver and other applications on the virtual ports.
- APCC - Removed incorrectly displayed SGPro warning on the meridian limits tab.
- APCC - Fixed popup message with incorrectly labeled buttons.
- APCC - Various other bug fixes and enhancements.
- APPM - Strip potential port number from network address in PinPoint platesolve settings to allow pinging to work.
- APPM - Fixed ASCOM file save function.
- APPM - Added Status bar on bottom to show device connection status.
- APPM - Fixed ASCOM connect - ASCOM device was not saved.
- APPM - When starting an APPM run a new settings summary window shows the parameters.
- APPM - Fixed - incorrect interpretation of the SetSlewRate response from APCC, which was mistakenly throwing an exception.
- APPM - Fixed - User defined slew rate was not being used.

### **Version 1.5.0.20 – 02-20-17**

**Note: This version should be used with the AP V2 ASCOM driver v5.09.04 or later.**

- APCC - Expanded allowable timezone range to -23:59:59 to +23:59:59.

### **Version 1.5.0.19 – 01-29-17**

- APCC - FIXED - Protect against certain out-of-range values in Home and Limits Configuration dialog.
- APCC - IMPROVEMENT - A popup window will open to restore unpark from last parked position after unparking from one of the named park positions. If the user is not at the screen or does not select an option, the window will auto-close and change the default to unpark from last parked position.
- APCC - FIXED - Status window's Connect/disconnect button wouldn't change when APCC is connected/disconnected from the mount.
- APCC - FIXED - a set tracking rate command was being sent out of order during initialization.
- APCC - IMPROVEMENT - On both the Horizon and Meridian Tabs, removed the Reset Limit Trigger button and the Auto-reset checkbox. Auto-reset is now always the default.

- APCC - IMPROVEMENT - removed the check box option to close the Stop Window when a slew completes. The Emergency Stop window now always closed automatically when a slew completes .
- APCC - BUG FIX - The Log Zipper was not working so it has been moved into its own separate application. The new log zipper application is included in the installer going forward.
- APCC - NEW FEATURE - Automatically send mount flip point to Sequence Generator Pro. "Meridian Limits" and "Counterweight up slews within West limits" must both be enabled.
- APCC Pro (APPM) - BUG FIX - After a point mapping run, APPM offers to immediately use the data. Clicking "OK" would often result in a message saying the model was not installed correctly (but it was). This false error message should no longer occur.
- APCC Pro (APPM) - IMPROVEMENT - when attempting to connect to Sequence Generator Pro, APPM first checks that SGPro is running. If SGPro is not running, a pop up message indicating that is displayed.
- APCC Pro (APPM) - BUG FIX - Numerous improvements and bug fixes to the plate solving architecture.
- APCC Pro (APPM) - BUG FIX - DSLR ISO values are now properly passed to SGPro.
- APCC Pro (APPM) - BUG FIX - The command to set Slew Rate was getting ignored when starting a APPM run.
- APCC Pro (APPM) - BUG FIX - Camera Binning setting was not being used to adjust the unbinned image scale.
- APCC Pro (APPM) - Optional settings review dialog allows you to review the settings before starting a mapping run.
- APCC - Updated documentation.

### Version 1.5.0.18 – 12/09/16 (Public Beta)

- APCC - Updated documentation.
- APCC - Fixed Status View Connect button text (never changed from "Disconnect").
- APCC - Advanced Settings window was missing the "Help" button.
- APCC - Fixed a problem that could cause the Virtual ports to not be auto-allocated.
- APCC - When the mount needs to be initialized APCC will now bring up the Initialize mount window, even if auto-initialize is disabled. The user can decide to initialize or not.
- APCC - Fixed issue with APCC showing the wrong button text when a connect to the driver fails.
- APCC - Removed some unnecessary debug log statements.
- APCC Pro (APPM) - APPM's slew rate was not getting set down in the mount.
- APCC Pro (APPM) - Fixed several problems with plate solve directory function.
- APCC Pro (APPM) - Fixed several bugs in the plate solving state machine.
- APCC Pro (APPM) - To improve startup speed, if dark frame subtraction is selected APPM will start the dark frame in parallel with the mount settling after a move.

### Version 1.5.0.17 – 11/14/16 (Private Beta)

- APCC - Updated documentation

### Version 1.5.0.16 – 11/02/16 (Private Beta)

- APCC Pro - Increased range of allowable barometric pressure from 800-1100 to 500-1300.
- APCC Pro (APPM) - Minor fixes for PinPoint compatibility (Note: PinPoint 6.1d or later is required if using PinPoint's All-Sky plate solves)

### Version 1.5.0.15 – 10/31/16 (Private Beta)

- APCC - Added new option in Advanced Settings to keep mount time synced to the computer. This option overrides the same feature in the ASCOM driver. If enabled, APCC will sync time even if the option in the driver is disabled (Driver v5.09.02 or later required). When disabled in APCC however, the driver can temporarily (until APCC is restarted) enable time sync in APCC. When connected to APCC the driver will delegate Time syncing to APCC and the driver will not itself perform time syncing.
- APCC - **EXPERIMENTAL - Requires driver v5.09.02 or later** - APCC will now define two Virtual Ports for the ASCOM driver. Because of the way COM interop works, a separate instance of the driver will be created each for ASCOM clients running from the user account, and for ASCOM clients running "as administrator." In a hope to allow applications that need to be run "as administrator" work with applications that don't.

- The first virtual port will be used by the instance of the driver started in user mode.
- The second virtual port will be used by the driver if it started "as administrator"
- APCC - Fixed range errors in some controls.
- APCC Pro (APPM) - Added support for SGPro Cameras to APPM.
- APCC Pro (APPM) - Removed checkbox for PinPoint All-Sky and added separate buttons to do All Sky Solve and All Sky Solve and Sync
- APCC Pro (APPM) - Added new plate-solving choices to APPM: SkyX Image Linking, and Sequence Generator Pro (tested with PlateSolveX)
- APCC Pro (APPM) - Added option to set explicitly set the Slew Rate for mapping runs.
- APCC Pro (APPM) - Added option to open Images in the by double clicking the entry in the mapping table.
- APCC Pro (APPM) - Added feature to Plate Solve files in a directory.

### **Version 1.5.0.14 – 09/19/16 (Public Beta)**

- APCC - FIXED - do not invoke COM port fallback when disconnected.
- APCC - FIXED - responses to the ASCOM driver could sometimes be delayed significantly, thus making the driver think it had lost a connection to the mount.
- APCC - Adjusted position of new indicators in the "Telescope Position" group box to look better for APCC Standard.
- APCC - Widened the "TRACK" indicator to allow "TRACKING" and "PARKED" to fit.
- APCC - FIXED - PEM indicator was not working correctly.
- APCC - Added "Auto-Reset" option to Horizon Limits and Meridian Limits. When checked these limits will automatically be reset when the mount goes back within limits.
- APCC - FIXED - APCC was returning a cached value of the mount's time to the driver, which was causing the driver to sometimes think the time had gone outside the two-minute range.
- APCC - Stopped using cached values on the virtual ports for the following commands: GC, GL, GG, GP, GA, and GZ. These commands now pass through to the mount.
- APPM - Added "Sequence Generator Pro" as a new camera option.
- APPM - Fixed the "Image Link Test" setting for TheSkyX plate solving.
- APPM - BUG FIX - Even when TheSkyX plate solving was selected, PinPoint Plate solves were being used. (more work needed here).

### **Version 1.5.0.13 – 09/07/16 (Private Beta)**

- APCC - Added COM port fallback to ethernet/wi-fi connection
- APCC - Added "Pier Flip" button to "Move Scope" and "Meridian Delay" Group boxes
- APCC - Added "Slew Speed" to "Move Scope" group box so that it is easy to tell the set slew speed.
- APCC - Rearranged controls in "Move Scope" group box to make better use of space
- APCC - Added Tracking State and PEM State labels (with Tool Tips) to "Telescope Position" group box
- APCC - Meridian/Horizon labels in "Telescope Position" group box can be single-clicked to open their respective tabs. Double clicking will toggle their enabled state.
- APCC Pro - Changed labels for Pointing and Tracking rate correction to "Point Corr" and "Rate Corr", respectively.
- These labels can be single-clicked to open the Pointing Model tab. Double clicking will toggle their enabled state.
- APCC - Added warning messages when enabling "Stop Tracking after Unparking"
- APCC - Don't allow user to set or clear Meridian Delay while Meridian Limits and Slew within East/West is enabled.
- APCC - Added "Exhaustive COM Port Search" option (default) to Advanced Settings
- APCC - Added "Just Warn" option to Meridian and Horizon Limits
- APCC - Fixed behavior of Horizon and Meridian Limits status fields
- APCC Pro - Changed RA and Dec pointing error from Decimal mins/arc-mins to Mins/Secs and Degs/Secs, respectively.
- APCC Pro - Changed RA and Dec tracking rate units from "secs/sec" and "arc-secs/sec" to a more understandable "secs/hour" and "arc-secs/hour", respectively.
- APCC - Close "Find GTOCP4" window when "Select" is clicked.

### **Version 1.5.0.12 – 08/30/16 (Public Beta)**

- APCC - Added check box to stop tracking after unparking.
- APCC - Changed confusing custom park Alt/Az boxes to labels.
- APCC - Changed look of a number of labels to be more consistent.
- APCC - Added status labels for Meridian Limits, Horizon Limits, Pointing and Tracking rate correction (Tooltip info is presented when mouse hovers over them).

### **Version 1.5.0.11 – 08/25/16 (Private Beta)**

- APCC - Fixed incorrect time zone when unparking
- APCC - Fixed meridian delay getting cleared when slewing with meridian limits disabled.

### **Version 1.5.0.10 – 08/22/16 (Public Beta)**

- APCC - Even more changes to Time Zone logic to fix issues with an European version of Windows.
- APCC - Fix double moves in counterweight up positions when using the GTOCP4.
- APCC - Fixed some logic errors with the Counterweight-up slews within East/West Limits.

### **Version 1.5.0.9 – 08/17/16 (Private Beta)**

- APCC - Further changes to Time Zone logic to fix issues with an European version of Windows.

### **Version 1.5.0.8 – 08/14/16 (Public Beta – Pro only)**

- APCC - Captured Time Zone initialization errors and allow APCC to complete startup.
- APCC - "Create Virtual Ports first" option will now automatically select a virtual COM port if none is defined for the first virtual port.
- APCC Pro - Fixed labels for RA pointing and tracking rate corrections
- APCC - when loading a settings file, put up a window indicating the operation is active.

### **Version 1.5.0.7 – 08/07/16 (Public Beta – Pro only)**

- APCC Pro (only) - Pointing model corrections were not being applied when a pier flip occurred when using a GTOCP4.

### **Version 1.5.0.6 – 07/17/16 (Public Beta)**

#### **New Features of APCC Standard and Pro**

- APCC – Added software home and limits function for all GTO mounts. Note: To avoid errors, this tab will not appear if the mount has absolute encoders, which has its own separate hardware/software solution.
- APCC – Updated Connection group box to include USB, Ethernet and WiFi options for the GTOCP4.
- APCC – Added four new application buttons (ApTimer, ApJog, ApRAPAS, PEMPro) to the Main Screen. They will only be visible if the corresponding application is installed.
- APCC – Automatically backs up the settings every time it starts so you can easily go “back in time” to earlier settings by loaded an earlier settings file.

#### **Additional New Features of APCC Pro**

- APPM - Add ASCOM Camera and SkyX Camera Add-on as new cameras.
- APPM - Add SkyX Plate Solving as alternative to PinPoint. (Note: This is not quite ready)

#### **Improved Interface – Standard and Pro**

- APCC - Placed the AutoConnect option into the Connect group box.
- APCC - Moved "COM Events" (COM Port events) button to status bar and renamed to "Comm Events" (Communications Events). It will turn light red (pink?) if there are any communications errors.
- APCC - Added "Auto-Connect Driver" and "Auto-Configure" driver options to "Connection" group box.
- APCC – Added tool tips to some of the options in the connection group box.
- APCC – Added a “NOW” button to do a one-time configuration of the ASCOM driver.
- APCC - Made mount timeout value available while connected (was formerly disabled while connected) to allow changing timeout dynamically.
- APCC - Moved "Create Virtual Ports first" option from "Advanced Settings" to "Connection" group box.
- APCC - Moved "Close Emergency Stop window when done slewing" option from "Advanced Settings" to "Program Operation" group box.
- APCC- Added one extra option to close the Emergency Slew window automatically after a slew completes.

- APCC - Added "Edit Initialize Mount Settings..." to the Settings menu. This allows a user to edit initialization settings without initializing the mount.
- APCC - changes to match the status window and main window's move rates.
- APCC - Changed look of the setup tab.
- APCC - Moved the Virtual Ports tab to the second tab position so users can find it more easily.

#### **Fixed Bugs or Improved Robustness and Function – Standard and Pro**

- APCC - Upgraded to the latest Eltima Virtual Port driver (v8.0.435).
- APCC - Improved overall robustness of Virtual Ports.
- APCC - Auto-create the first virtual port if not defined when starting.
- APCC - Improved robustness of matching the ASCOM driver's port to APCC's first virtual port (requires ASCOM driver v5.09.00 or later).
- APCC - Added new way of determining which COM ports are real and which are virtual ports.
- APCC - Improved intelligence in selecting a free virtual com port for the driver to use.
- APCC - Added a command line switch so APCC knows it is being started by the driver and can do certain start up actions to better ensure the driver can connect.
- APCC - Added more debug statements to track down issues when users have COM port errors.
- APCC - Before unparking force meridian delay to 0.
- APCC - Prevent the Log Zipper window from being used while connected to the mount or driver.
- APCC - Disable Log Pausing for now to capture any potential errors that might be missed when logging is paused.
- APCC - Added additional log output to help debug certain scenarios.
- APCC - Add more logging detail for debugging in case a network error occurs.
- APCC - APCC automatically starts a new log file if the log file size exceeds about 100 MB.
- APCC - When connecting to the AP driver, if "Auto-config" is not selected APCC will automatically setup the driver's COM port and APCC setting if not correctly set.
- APCC - APCC will try up to 3 times to write a setting to a file before throwing an error. It will wait at least 50 milliseconds before retrying a save.
- APCC - "Initialize Mount..." option in Settings menu no longer will proceed unless mount is connected and RA=0 and Dec=90.
- APCC - Add popup window to report details of unhandled exceptions back to Ray Gralak (The user must ok the sending of this data).
- APCC - fixed problem reported by Joe Z. (never-ending park when the park position is under the Horizon limit).
- APCC - Fixed a bug that sometimes caused an incorrect park position.
- Horizons - Added extra debug statements.

#### **Fixed Bugs or Improved Robustness and Function – Pro**

- APCC - Fixed problem reported by David on AP-gto forum concerning goto incorrectly loading the mount's RA/Dec with Pointing Correction enabled.
- APCC - Added a check for a minimum ASCOM platform version, which was causing an issue with APCC's pointing calculations because the old ASCOM utility functions had a few bugs.