Astro-Physics Command Center (APCC)
Help File

APCC Getting Started
Quick Guide

1.7

03/06/19

1   Welcome to APCC

Welcome to the instruction manual and help file for the Astro-Physics Command Center (APCC). This is a working document that will be updated frequently based on user feedback. Please check back often to obtain the most recent version.

The topics in this "Welcome" section provide information about the features of APCC Standard and Pro versions, version history and the license agreement. We hope you find this information useful and easy to understand.
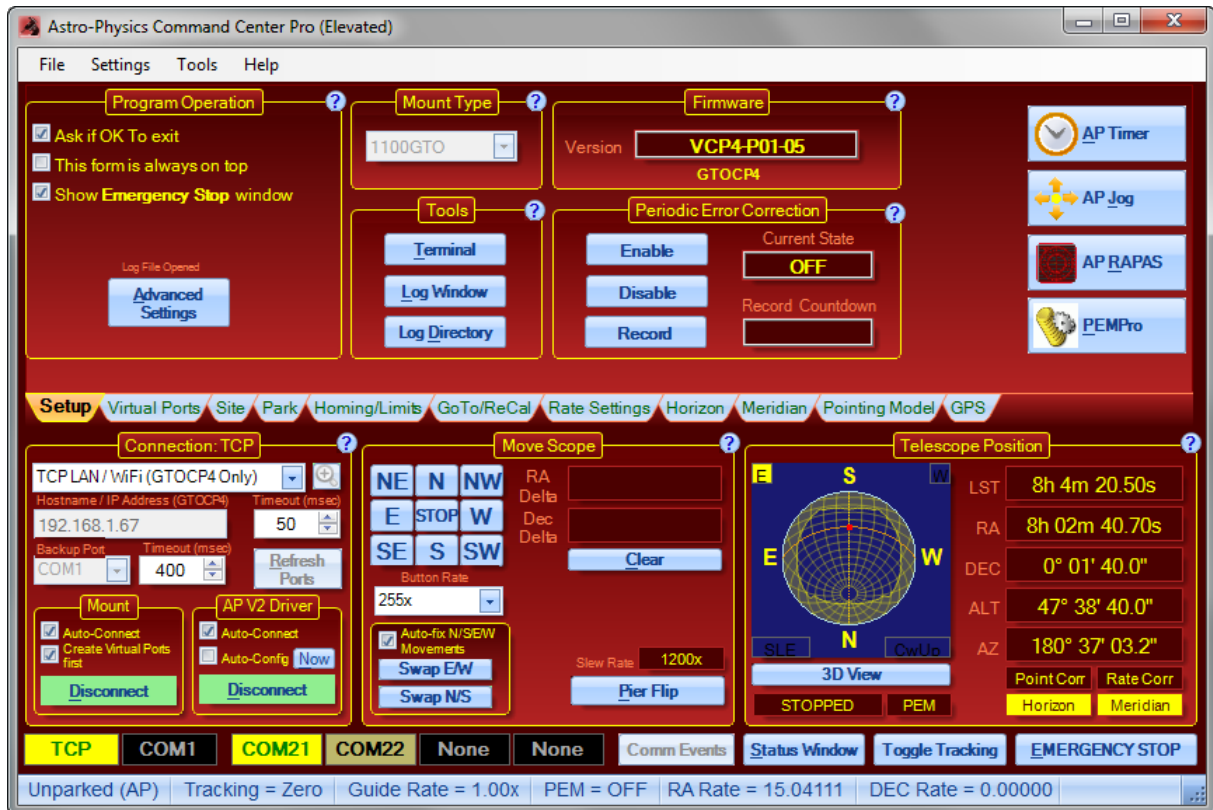
The Astro-Physics Command Center (APCC) Main Window

1.1   Features

Astro-Physics Command Center (APCC) is available in two versions, APCC Standard and APCC Pro. Please review the feature list below regarding each version.

APCC Standard Features

- Full support for the GTOCP4 control box including Ethernet and WiFi connectivity.

- Support for increased precision in the GTOCP4.

- NEW in v1.7 -- Support for Encoder-equipped mounts, including configuration of encoder-based Home, and RA/Dec encoder limits.

- NEW in V1.7 -- Support for ASCOM ObservingConditions.

- NEW in V1.7 -- Improved support for operation with Sequence Generator Pro.

- NEW in V1.7 -- Meridian limits now has a merdian flip offset feature.

- All features of the latest GTOCP3 control box firmware are supported allowing feedback of the actual status of the mount at all times.

- Tight integration with the AP V2 ASCOM driver.

- Advanced support features for 3600GTO/3600GTOPE, 1600GTO and 1100GTO series mounts, including Home recovery.Editable 3D telescope view shows the current orientation of your telescope.

- 3D Viewer warns you if your celestial coordinates differ more than 5 degrees from the mechanical axis coordinates which could indicate trouble.

- Editable horizon tracking limits to stop tracking or park the mount once a horizon limit is reached.

- Editable meridian tracking limits to protect your telescope from pier collisions, and yet allow safe tracking past the meridian.

- Slew to counterweight-up positions with dynamic meridian delay feature (tied to meridian tracking limits).

- Safety slews for going into and out of counterweight-up positions. All declination movement occurs while counterweight is safely pointing down.

- Multiple virtual ports to allow easy connection of applications that do not require ASCOM support (like PulseGuide or TheSky6/X).

- Site management allows easily changeable setup for multiple sites.

- Display and change time zone settings

- Support for reading latitude/longitude/elevation from third-party GPS devices

- GoTo/ReCal on RA/Dec and Alt/Az coordinates

- Coordinate conversions for JNow <-> J2000 and Alt/Az <-> RA/Dec

- Access to backlash, reticle, focus (GTOCP3) and PEM settings (All mounts).

- Set custom RA/Dec tracking rates

- Can save/recall multiple RA/Dec and Alt/Az slew coordinates.

- Park to editable alt/az position.

- Available safety timer will cause the mount to park after a settable interval if a controlling computer crashes or loses COMs.

- Enables auto-park on power-down.

- Easy to read status window summarizes mount status of critical parameters.

- Logging of all commands for debugging if a problem occurs.

- Convenient log zipper function to bundle relevant log files should problems occur and you need support from AP's world-class support team!

- Can be configured to utilize a secondary serial port to prevent communication loss if a serial port to USB converter or network connection fails

- Terminal Interface tool to send commands directly to the mount.

- Includes the Horizons program for satellite, comet and asteroid tracking.

- Errant ReCal protection.   Prevent outside client software from recalibrating on the wrong object

- Home and Limits for NON-Encoder mounts. Now your 400GTO, 600EGTO, Mach1GTO, 900GTO, 1200GTO or non-encoder 1100GTO, 1600GTO or 3600GTO can have Home and Limits

APCC Pro Features

- Includes all features of the Standard version.

- Dual-model pointing and tracking rate correction even with the telescope in the counterweight-up position

- Includes a separate application to acquire Pointing/Tracking model data (APPM).

- NEW in v1.7 -- Many improvements and bug fixes to APPM.

- NEW in v1.7 -- Improvements and bug fixes that improve pointing and tracking rate accuracy.

1.2   Version History

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 **MGBoxV2** 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 must 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 must 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 must 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 formated 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 - 02/25/2017 (Public Release)

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 - 01/29/2017 (Public Beta)

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

APCC - Updated documentation.

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). model. 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.

Version 1.5.0.18 - 12/09/2016 (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 - 11/14/2016 (Private Beta)

APCC - Updated documentation.

Version 1.5.0.16 - 11/02/2016 (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 - 10/31/2016 (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 - 09/19/2016 (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 - 09/07/2016 (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, repetively.

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 - 08/25/2016 (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 - 08/25/2016 (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 - 08/21/2016 (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 - 08/17/2016 (Private Beta)

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

Version 1.5.0.8 - 08/14/2016 (Private Beta)

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 - 08/07/2016 (Private Beta)

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

Version 1.5.0.6 - 07/17/2016 (Public Beta)

APCC - Fixed double initialization that can happen sometimes.

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 (as an alternative to the "auto-config" option that re-configures every time APCC starts the ASCOM driver).

Version 1.5.0.5 - 07/13/2016 (Private Beta)

APCC - Removed unintentional residual use of Eltima 7.x.

Version 1.5.0.4 - 06/27/2016 (Private Beta)

APCC - Direct broadcasts for GTOCP4's out all network devices that support IP V4.

APCC - Allow control characters to be sent in Terminal Interface (by pressing CTRL+character)

APCC - Upgraded to the latest Eltima Virtual Port driver (v8.0.435).

IMPORTANT NOTE: This requires any previous version of APCC to be uninstalled.

Version 1.5.0.3 - 06/05/2016 (Private Beta)

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 - Before unparking force meridian delay to 0.

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)

Version 1.5.0.2 - 06/03/2016 (Private Beta)

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.

Version 1.5.0.1 - 05/31/2016 (Private Beta)

APCC - Fixed accidental dual Virtual port threads when there should have been only one thread.

Version 1.5.0.0 - 05/31/2016 (Private Beta)

APCC - Poll site longitude/latitude from the mount when connecting to the mount.

APCC - Add more logging detail for debugging in case a network error occurs.

Version 1.0.25.0 - 05/29/2016 (Private Beta)

APCC - Moved polling to a background thread so that resizing windows and other user interface actions do not slow down polling (noticed by Chris Erickson)

APCC - Removed UDP checkbox, and the Serial/USB and the Net/WiFi radio buttons and replaced with a drop down list of connection methods. While connected the user can still switch between UDP and TCP in real-time.

APCC - Instead of "Net" the first connection status box will show "TCP" or "UDP", reflecting the protocol being used.

APCC - Added a new discovery button to locate any CP4 on the local LAN and allow it to be selected.

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 - When starting APCC it will create a full backup of settings in C:\ProgramData\Astro-Physics\APCC\Backups.

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.

Version 1.0.24.0 - 05/25/2016 (Private Beta)

APCC - Add UDP as alternative to TCP/HTTP requests.

Version 1.0.23.0 - 05/22/2016 (Private Beta)

APCC - BUG FIX - disconnecting the driver did not update the button user interface state correctly.

Version 1.0.22.0 - 05/21/2016 (Private Beta)

APCC - Major internal changes to combine multiple commands for more efficient polling of the GTOCP4 when using LAN/wi-fi.

Version 1.0.21.0 - 05/14/2016 (Private Beta)

APCC - Refinements to improve Ethernet/Wifi command/response reliability.

Version 1.0.20.0 - 05/13/2016 (Private Beta)

APCC - Made mount timeout value available while connected (was formerly disabled while connected) to allow changing timeout dynamically.

APCC - Create separate timeout values for Ethernet/Wifi and for Serial/USB ports.

APCC - Lowered Ethernet minimum timeout to 10 msecs.

APCC - In "Comm Events" window add a "Clear Queues" button to allow a user to clear all command queues to hopefully allow a lost wifi connection to be res-established.

APCC - Removed "Reset Limit Triggers" button in Home/Limits tab.

Version 1.0.19.0 - 05/12/2016 (Private Beta)

APCC - BUG FIX - Fixed Primary and backup COM port boxes. They were too narrow to fit two-digit COM ports.

APCC - BUG FIX - COM ports were sometimes randomly ordered in the drop down list box. They are now sorted numerically.

APCC - BUG FIX - Emergency Stop window wasn't stopping moves for the GTOCP4.

Version 1.0.18.0 - 05/11/2016 (Private Beta)

APCC - Changed text and position of some Connection group box controls around for more clarity.

APCC - Disable Ethernet/WiFi option if GTOCP3 is being used.

APCC - Fixed bug in the Connect operation to the AP V2 Driver.

Version 1.0.17.0 - 05/10/2016 (Private Beta)

APCC - Slightly increased height and width of APCC's main window to fix additional Connection group box controls for ethernet/wi-fi connections.

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 - Reworked Connection group box to include radio control options for Ethernet/Wi-fi and Serial/USB

APCC - Moved Connect Driver button from Virtual Ports tab to Connection group box

APCC - When APCC is connected to the mount or driver, the corresponding button turns light green as an indication.

APCC - Moved "Close Emergency Stop window when done slewing" option from "Advanced Settings" to "Program Operation" group box

APCC - Moved "Create Virtual Ports first" option from "Advanced Settings" to "Connection" group box.

APCC - Added "Auto-Connect Driver" and "Auto-Configure" driver options to "Connection" group box.

APCC - Added "Edit Initialize Mount Settings..." to the Settings menu. This allows a user to edit initialization settings without initializing the mount.

APCC - "Initialize Mount..." option in Settings menu no longer will proceed unless mount is connected and RA=0 and Dec=90.

APCC - BUG FIX - Fixed issue with Emergency Stop window not closing after parking.

APCC - BUG FIX - the Error Log Window no longer also opens the 3D Viewer.

APCC - BUG FIX - Home and limits feature never requires reprogramming the GTCP4 personality

APCC - APCC automatically starts a new log file if the log file size exceeds about 100 MB.

Version 1.0.16.0 - 05/01/2016 (Private Beta)

APCC - BUG-FIX - fixed endless re-initialization loop when mount was first initialized

Version 1.0.15.0 - 05/01/2016 (Private Beta)

APCC - BUG FIX - Fixed exceptions when connection the driver to APCC.

Version 1.0.14.0 - 05/01/2016 (Private Beta)

APCC - Added ability to connect to the GTOCP4 via an ethernet/wi-fi connection.

Version 1.0.13.0 - 03/26/2016 (Private Beta)

APCC - Added "Update personality" button and associated functionality to enable end users to reconfigure their mount to use the Home and Limits feature. The button will only display if the personality has not already been updated.

APCC - Made Goto RA/Dec controls like Goto Alt/Az controls.

Version 1.0.12.0 - 03/16/2016 (Private Beta)

APCC - Fixed a bug in the Status window that would cause an exception if the user had configured the Status Window to be shown when APCC starts.

Version 1.0.11.0 - 03/16/2016 (Private Beta)

APCC - disable safe slews if it detects the CP4.

APPM - Add ASCOM Camera and SkyX Camera Add-on as new cameras.

APPM - Add SkyX Plate Solving as alternative to PinPoint.

APCC - Add popup window to report details of unhandled exceptions back to me (The user must ok the sending of this data).

Version 1.0.9.0 - 12/29/2015 (Private Beta)

APCC - made an user interface change for the Declination limit.

Version 1.0.8.0 - 12/23/2015 (Private Beta)

APCC - changes to match the status window and main window's move rates.

APCC - added a warning for the east/west limits

APCC - Hide the home/limits tab if AE box is detected.

Version 1.0.7.0 - 11/23/2015 (Private Beta)

APCC - Added settings save via SQLITE database.

APCC - Added new status box to the user interface for backup COM port.

APCC - Added new way of determining which COM ports are real and which are virtual ports.

Version 1.0.6.0 - 11/16/2015 (Private Beta)

APCC - improved intelligence in selecting a free virtual com port for the driver to use.

APCC - Fixed issue with backup COM port not working as designed.

APCC - Fixed syntax error in a command sent to the mount (double ":")

Horizons - Added extra debug statements.

Version 1.0.5.0 - 11/04/2015 (Private Beta)

APCC - Some semi-major reorganization of the user interface.

1) Changed look of the setup tab.

2) Placed the AutoConnect option into the Connect groupbox.

3) Moved the Virtual Ports tab to the second tab position so users can find it more easily.

4) Each of the four new application buttons (ApTimer, ApJog, ApRAPAS, PEMPro) will only be visible if the corresponding application is installed.

5) Added one extra option in the Advanced settings to close the Emergency Slew window automatically after a slew completes.

Version 1.0.4.16 - 10/25/2015 (Private Beta)

APCC - Added more debug statements to track down issues when users have COM port errors.

Version 1.0.4.15 - 10/8/2015 (Private Beta)

APCC - (now defunct) balance mount procedure.

Version 1.0.4.14 - 10/1/2015 (Private Beta)

APCC - fixed problem reported by David on Ap-gto forum concerning goto incorrectly loading the mount's RA/Dec with Pointing Correction enabled.

Version 1.0.4.13 - 9/17/2015 (Private Beta)

APCC - fixed problem reported by Joe Z. (never-ending park when the park position is under the Horizon limit).

Version 1.0.4.12 - 9/12/2015 (Private Beta)

APCC - fixed the lockup problems and the RA/Dec limits.

Version 1.0.4.11 - 9/7/2015 (Private Beta)

APCC - fixed limit bug with Park 4.

Version 1.0.4.10 - 9/5/2015 (Private Beta)

APCC - Fixed problem with the "Set" personality commands.

Version 1.0.4.9 - 9/5/2015 (Private Beta)

APCC - Fixed problem with the "Get" personality commands

APCC - Implemented the faster bounce logic.

Version 1.0.4.8 - 9/3/2015 (Private Beta)

APCC - Fixed a bug that sometimes caused an incorrect park position.

APCC - Pol mount for personality and disable Home/Limits tab if personality has not been updated.

Version 1.0.4.7 - 8/29//2015 (Private Beta)

APCC - Added read personality command.

APCC - Changed bounce back to happen only in the axis that hits a limit (and not both axes).

APCC - Added short pause before a bounce.

Version 1.0.4.6 - 8/28/2015 (Private Beta)

APCC - added an automatic clear of the limits if the mount goes back within limits.

APCC - added the bounce back option but I didn't have time to try it this morning so I'm not sure it will work as you expect. When bouncing back I start homing operations on both axes simultaneously and stop after 2 seconds.

APCC = fixed typo in the Dec Limits checking. It wasn't checking Dec limits at all like it was supposed to but was checking RA limits.

Version 1.0.4.5 - 8/27/2015 (Private Beta)

APCC - Fix an issue with the limits not being saved.

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.

Version 1.0.4.4 - 8/13/2015 (Private Beta)

APCC - Properly handle Home configuration aborts

APCC - Limits should now work for both Southern and northern hemisphere

APCC - Added three new limit actions:

    a) "Just Warn" -- does nothing but pop up an asynchronous window warning the user that a limit was breached (all actions do this also). This might be good for your testing so you won't be triggering parks and homing actions.

    b) "Stop Slew" -- Stops the slew but does not stop tracking.

    c) "Stop Slew, Stop Tracking" - Stops slew and tracking, but does not Park

Version 1.0.4.3 - 8/12/2015 (Private Beta)

APCC - Use the move RA/Dec fields to detect slewing done when homing (the GOS slew field is not indicating correctly).

Version 1.0.4.2 - 8/11/2015 (Private Beta)

APCC - Added missing RA home command.

APCC - Other minor fixes to homing/limits logic.

Version 1.0.4.1 - 8/10/2015 (Private Beta)

APCC - Fixes and changes to Home and Limits tab.

APCC - Added error log window

Version 1.0.4.0 - 7/9/2015 (Private Beta)

APCC - Added 3D Warning Windows.

APCC - Add Calibrate Home Warning Windows.

APCC - Started work on Environmental Graph Window.

APCC - Added Home and Limits window.

Version 1.0.3.4 - 5/27/2015 (Release)

APCC - BUG FIX - releasing any of the Status View move buttons would trigger the Emergency Stop window because the StopMove function used by the Emergency stop button was also used by the mouse up events for all of the Status View's move buttons.

Version 1.0.3.3 - 5/27/2015 (Release Candidate)

APCC - Redesigned 3D Scope syncing logic to fix potential boundary conditions where the 3D scope view might incorrectly show the mount's orientation.

APPM - Internal changes preparing for additional plate solving

Version 1.0.3.0 - 4/20/2015 (Beta)

APCC
* To prevent confusion on the use of the refraction checkboxes, they have been removed.
* Fixed display issues with the 3D Scope View
* Added "Create Virtual Ports First" option to Advanced settings, which when enabled will always create the
virtual ports, even if the mount is off or not connected. This will allow the ASCOM driver to attach to a virtual port
and potentially wait for the mount to be powered on.
* Fixed extra flip when scope is in a counterweight up position and the meridian limit set such that scope should slew directly to the target position.
* Fixed similar to the above when meridian limits are set up.
* Fixed rounding error in longitude/latitude
* Park 2 and Park 3 used a hour angle of exactly -6, which caused some anomalies.
* Added additional commands for external programs to use:
? APCCVERSION returns Pro or Standard
? LIMITREACHED returns if a limit has been reached (Meridian or Horizon)

? SETTEMP/GETTEMP
? SETPRESSURE/GETPRESSURE
? SETHUMIDITY/GETHUMIDITY

APPM
Added missing DLL for AstroArt
Added new camera option to select SkyXPro Camera

Horizons
Allow "steps" to be used in calculations for fast moving satellites, like ISS
When clicking Stop tracking button tracking was completely stopped instead of returning to sidereal
Added option to display Native tracking rates.

Version 1.0.2.0 - 1/16/2015 (Release)
APCC - BUG FIX - Fixed link in Horizons to APCC's help file.

APCC - BUG FIX - Set Meridian Delay to 0 before unparking.

APCC - BUG FIX - Fix excessive CPU utilization when "Automatic Shutdown" is selected.

APCC - BUG FIX - Improve some of ELS homing functionality.

Version 1.0.1.0 - 1/1/2015 (Beta)

APCC - Allow APCC to be connected to a COM Port waiting for mount to be turned on.

APCC - BUG FIX - Fixed "arithmetic overflow" that sometimes happened when calculating CRCs

Version 1.0.0.9 - 12/20/2014 (Release)

APCC - BUG FIX - Fixed start up issue with Windows XP.

APCC - BUG FIX - Fixed homing issue with 3600 mounts Homing feature.

Version 1.0.0.8 - 11/30/2014 (Beta 8-11)

APCC - BUG FIX - Fixed extra slew that was happening sometimes when slewing from Park 1.

APCC - BUG FIX - Main window's position should now be restored if the Save windows positions option is set. Also, other window positions should be saved when closing the main window to exit APCC. Previously the windows had to be closed first to be remembered.

APCC - BUG FIX - Not all COMM timeouts were being reported in the COM Timeouts window.

APCC - Improved detection of mount disconnects and reconnects. LST/RA/Dec/Alt/Az fields will now flash when mount connection is lost.

APCC - Made improvements to logging.

Version 1.0.0.8 - 11/22/2014 (Beta 1-7)

APCC - Meridian Limits - Changed entry value precision to 2 decimal places.

APCC - Improved robustness of "Connect to Port" logic.

APCC - Improved the look and feel of the COM Port warning/error dialog. Removed pop-up warning messages (replaced by aforementioned dialog).

APCC - Changed "Administrator" to "Elevated" to more accurately describe APCC's privilege level. Implemented a different way to check for elevation.

APCC - BUG FIX - Main window's position should now be restored if the Save windows positions option is set.

APCC - BUG FIX - Port status colors were sometimes incorrect.

APCC - Tweaked Park 1, 3, and 4's positions

APCC - Added "Always on top" option to Scope 3D View window.

APCC - BUG FIX - If the THUM service is running queries to the THUM would fail after 10 seconds but would hold up APCC during that time so querying the THUM has been moved to a separate thread. WARNING: users should NOT install and/or enable the THUM service/application software because then APCC will not be able to communicate with the THUM.

APCC - BUG FIX - Added separate checks for updates for the Standard and Pro editions.

APCC - Added various information to the log files.

APPM - New Feature (Pro Only) - For dome users added new passive method for checking for dome move completion. Instead of actively moving the dome via the ASCOM dome slewing commands, APPM will assume that another program (e.g. DC3 dreams' ACP software) will issue the slew. APPM just passively waits for the slew to complete. This option is setable via a new dome settings window in APPM's settings menu.

Installer - Give permissions to "everyone" for Read/write access for logs and settings directories.

Version 1.0.0.7 (Official Release) - 10/12/2014

APCC - FEATURE - Added an option to the Log window to only show telescope move commands, which can be useful for debugging autoguider issues.

Version 1.0.0.6 - 10/06/2014

APCC - Fixed issue with reading settings file.

Version 1.0.0.5 - 8/25/2014

APCC - Declination degrees was being set to 0 after a save if the field was a negative value.

APCC - Restored "West Limits" check box and finished implementing corresponding functionality (see help section on Meridian Limits).

Version 1.0.0.4 - 8/15/2014

APCC - Now requires firmware version 'V" or later to run.

APCC - Changed out of date references to "U" firmware to save "V" firmware.

APCC/APPM - Further updates to the documentation .

Version 1.0.0.3 - 8/10/2014

APCC - BUG FIX - ASCOM driver would lock up if "Check for Valid Firmware" was clicked and the driver was already setup to talk to APCC.

Version 1.0.0.2 - 8/8/2014

APPM - BUG FIX - Changing how Image FIT files were saved in an APPM run did not change immediately (required a restart).

APCC - BUG FIX - When "start with Status View Window" was selected and the Main window brought up from the Status View, the Status View Window would minimize if the main window was minimized. Now the Main Window will (only) Minimize and optionally hide itself if the appropriate settings are enabled.

APCC - BUG FIX - Clicking a button to show a window from the Status View would not show the window if the window was previously opened but minimized.

APCC - BUG FIX - Horizon Limits check box was (purposely) cleared whenever parking or initializing the mount. Now it is not cleared but not "armed" until the scope if first slewed into an area that is within the horizon limits. Also, when clearing the Horizon limits trigger (which starts tracking) it won't actually be armed again until the mount is again within the Horizon limits.

APCC - Made visible the "Correct for refraction" check box.

Version 1.0.0.1 - 7/16/2014

APPM - fixed bug reading Horizon limits from APCC's settings file.

Version 1.0.0.0 - 7/14/2014

APCC - added a triangulator class for future use.

APCC - automatically force the ASCOM driver to enable "chkAllowConnectIfMountNotPresent".

APCC - Updated the Help file with Howard's changes.

APPM - Improved performance of APPM when adjusting Point map and connected to APCC/Driver.

Version 0.99.99.73 (Release Candidate) - 6/25/2014

Minor changes to try to fix an issue found in RC72.

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2   Getting Started

Upgrading from 1.0.x

It is important to note that v.1.5.x is a significant upgrade from 1.0.x with many new features and many changes. To make the upgrade go smoothly, please follow the Instructions below:

1. Open your current APCC v. 1.0.x

2. On the Setup Tab; in the program operation box; click the Advanced Settings Button. In the Advanced Settings Window:

    a. UN-check Auto-select first virtual COM port if not defined

    b. UN-check Create Virtual Ports first, even if not connected

    c.   UN-check Auto Initialize (secs)
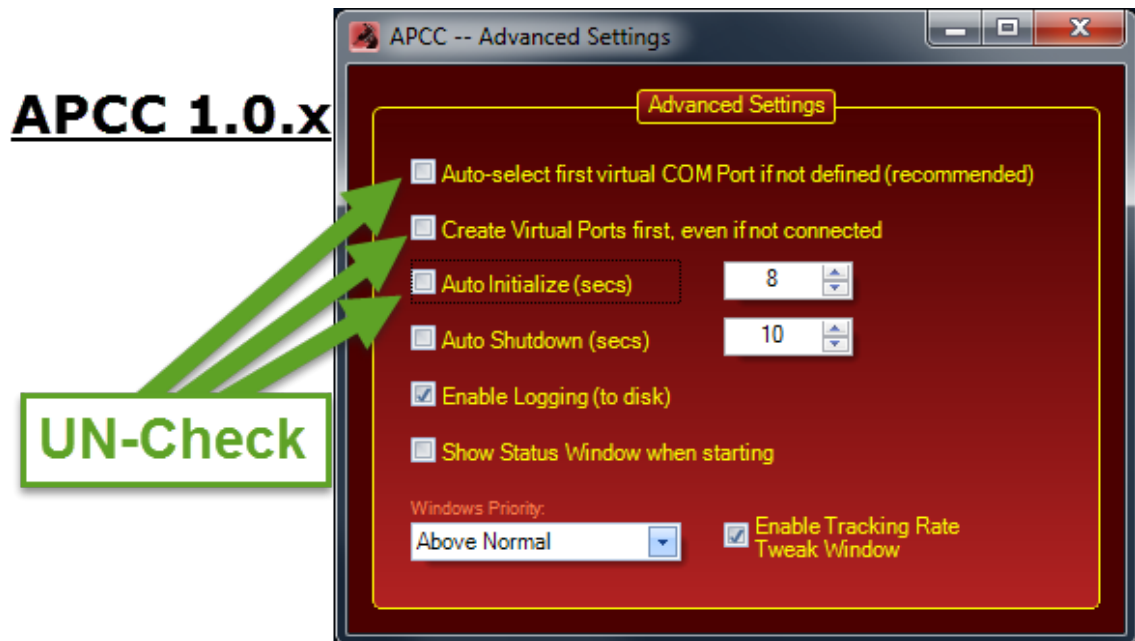
3.   Click on the Virtual Ports Tab

    a.   UN-check Auto-Connect COM port and create Virtual Ports when started

    b.   UN-check Auto-connect to ASCOM driver on first Virtual Port
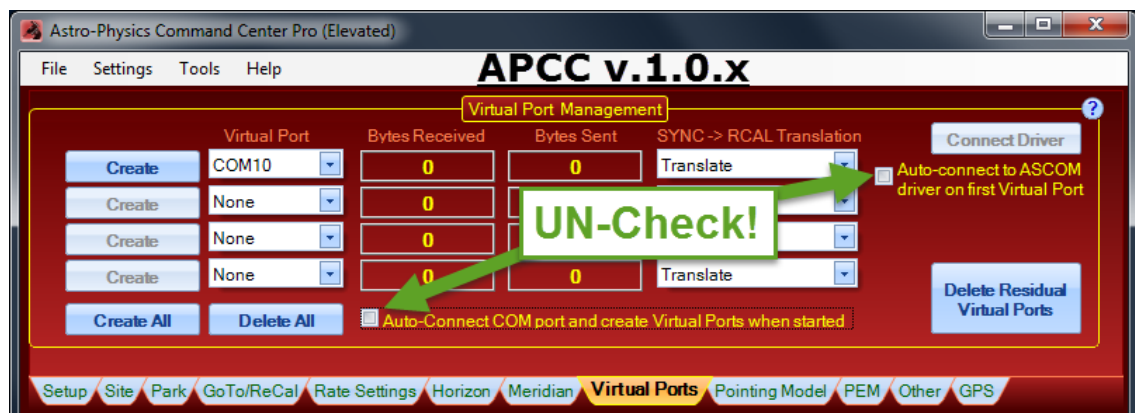
4.   Close APCC

5.   In Windows Control Panel:

    a.   UN-Install APCC and all of its components

    b.   UN-Install the AP V2 Driver and all of its components

General Information

The information in the rest of this section will guide you through the APCC installation process and show you how to set it up with the Virtual Port for the Astro-Physics V2 ASCOM driver.

Two detailed work flow sections have been prepared:

1. The first - Getting Started Work Flow - outlines the work flow for getting the program set up for your system. The tasks in this section are performed when you first start using APCC, and are performed much less frequently afterward.

2. The second work flow section - Operational Work Flow Basics - gives you an outline of the general work flow you will use in your night to night astronomy endeavors.

To get the most from your observing session with APCC, be sure to review the Tips to Get the Most from APCC.

In addition to this manual, there are some instructional videos at this link that you may find helpful.

2.1 Getting Started Work Flow

There are basically two work flow descriptions that should be helpful to you as you work with APCC. First, you need to understand how to get the program set up to work with your mount, your observatory and other software. This section provides a step-by-step outline of this work flow - but it is an outline. Be sure to follow the more detailed steps in the next three sections to actually set up your system with APCC. Later in this "Getting Started" section, we will provide the second section on operational work flow. This will deal with suggested procedures and methods of operation in your normal night-to-night observing and imaging after your system is all set up.

Before You Start

1. Get familiar with your mount. If you are new to Astro-Physics mounts, spend some time simply using the mount with the keypad. Learn how your mount behaves. Become familiar with the mechanics of the mount.

2. Make sure that you are familiar with the other software programs that you plan to use with APCC. If you try to learn TheSkyX, Starry Night, MaxIm DL, CCDStack, ACP, CCDAutoPilot and APCC all at the same time, you will probably be doomed to failure.

3. Become familiar with the AP V2 ASCOM Driver before you begin using APCC. Since most of the software you will use with APCC will work through the AP V2 ASCOM Driver, it is best to first become proficient with operations with the driver. If you have been using a program like TheSkyX with its native driver, make the switch to using it with the AP V2 ASCOM Driver before combining it with APCC.

4. Confirm that you meet all of the Hardware/Software Requirements in the next section.

Initial Setup - Recommended "Easy" Setup

1. Prepare all of your physical connections. Have the cables ready to go.

2. Close ALL other software, especially other astronomy software (possible ASCOM client software)

3. Install in order:

    a. The Latest ASCOM Platform, if not already installed - v. 6.3 or later

    b. The Latest AP V2 ASCOM Driver if not already installed - v. 5.09.11 or later. If upgrading from 5.08.x or earlier, you _**MUST**_ uninstall older versions of the driver in Windows Control Panel first!

4. Follow the instructions in the section that follows to: Install APCC. During the install:

    a. Be sure you check the box to: Install / Re-install the Virtual Ports. V. 1.5.x includes a new, updated Eltima Virtual Port driver.

    b. Check the box to: Allow to run after install.

    > **Warning:** **DO NOT interfere with the two command windows (black DOS boxes) that will appear toward the end of the installation process! Doing so will cause a failure of the virtual port system. Click the link above for more details.**

5. NEW USERS: When APCC starts, enter your license key information when prompted to do so. This can be either the trial or full license key.

6. NEW USERS: You will be prompted to enter your site information for your primary site. You can also enter information for any other sites you wish at this time. For getting started, you only need the first site you will use, so don't worry if you don't have the information for every site you will eventually enter. You can add sites later.

7. Decide on and define your Primary and secondary Virtual Ports. (Pick a port number for each and create the port in the Virtual Ports Tab. We recommend COM 21 and COM 22 for most people. This avoids conflicts with real ports.)

    a. Once you have created the primary port, you can check the Create Virtual Ports First check box in the Mount section of the Connections Group Box.

8. Close the driver's Setup Telescope window if it is still open from the update to the AP V2 Driver.

9. To configure the AP V2 driver for APCC, simply click the small, but mighty Now button in the AP V2 Driver section of APCC's Connection Group box.
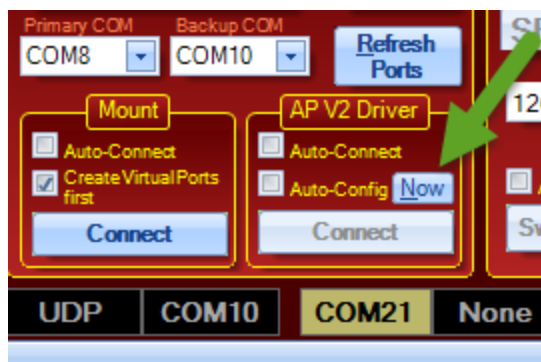
    a. Click OK on the two boxes that follow:
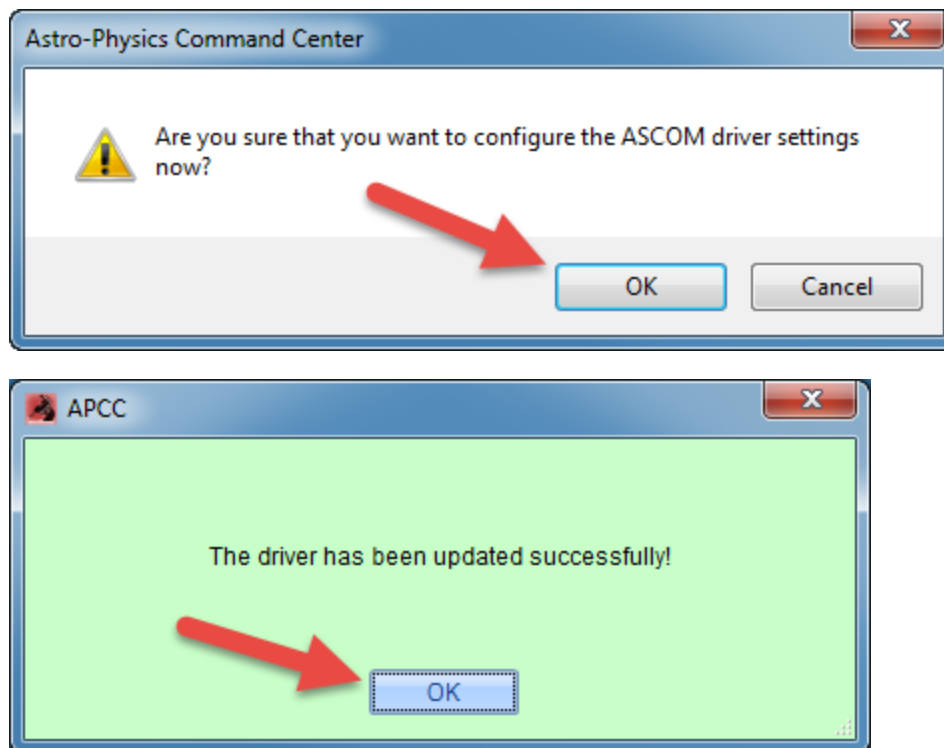
The AP V2 driver will now be configured correctly for connection through the APCC Virtual Port you defined earlier.

10. From the APCC Settings Menu (on the menu bar at the top), select Edit Initialize Mount Settings... This will open the Initialization Window. Enter your desired settings and then click the "Save" button.
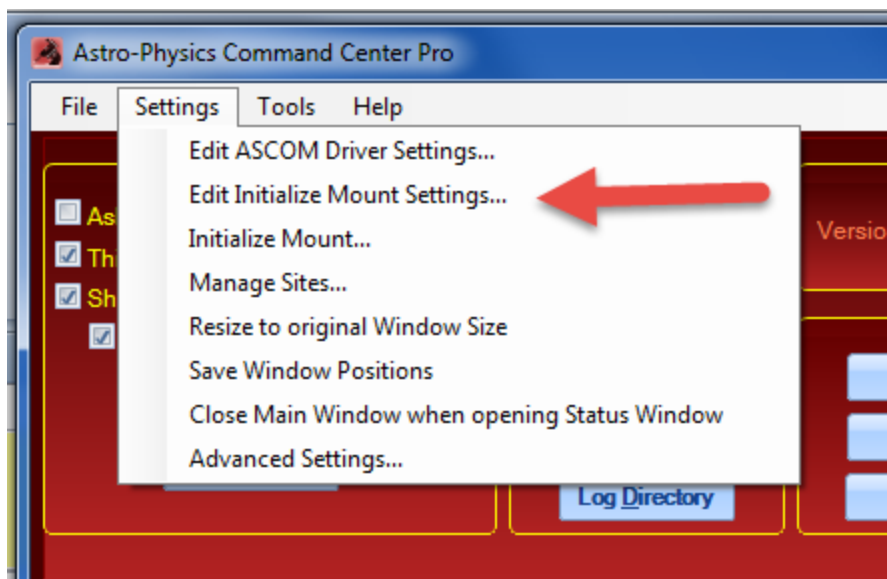
11. In APCC's Connections Group Box, select your connection method for connecting APCC to your mount - COM port, or Network for GTOCP4 owners.

12. Power up the mount.

13. Click the Connect button in the Mount section of the Connections Group Box. Your primary connection indicator should turn yellow.

14. Click the Connect button in the AP V2 Driver section of the Connections Group Box. Your primary Virtual Port indicator should turn yellow

15. Start to Play!! The instructions above will get anyone started with APCC. As you become more familiar with the program, you may wish to set up additional parameters as described in the section below.

16. Final note: AFTER you have set everything up and tested through a start-up shut-down cycle or two, you will probably want to consider checking some of the auto-connect options in APCC's Connections group box.

    a. Auto-Connect Mount - best for permanent setups or for semi-portable setups that are used at the same location most of the time. If you travel to different sites, leave this unchecked.

    b. Create Virtual Ports First - almost everyone will want this checked.

    c. Auto-Connect AP V2 Driver - again, best for permanent setups as in "a" above. DO NOT check this if you start APCC from an ASCOM client program (doable, but NOT recommended).

    d. Auto-Config AP V2 Driver - Unless you use the driver occasionally by itself, leave this UNchecked. Use the Now button as described above for your initial driver setup. Also, as in "c" above, DO NOT check this if you start APCC from an ASCOM client program.
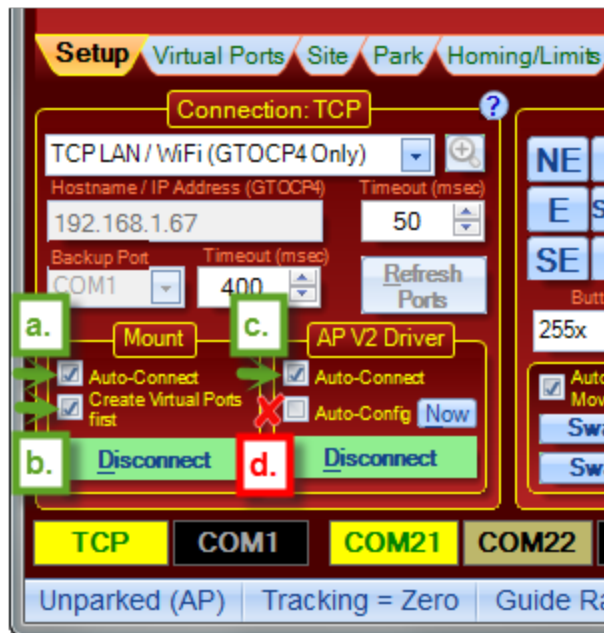
Typical for most users

Additional Things to Consider at the Getting Started Phase

1. Most users will only need the first 2 Virtual Ports for the AP V2 ASCOM Driver (The 2nd port is for client programs that must run as administrator.) You may, however, want to configure the rest of the Virtual Ports Tab for the way you plan to use your system.   Add extra virtual ports ONLY if you need

them (i.e. for a non-ASCOM app like PulseGuide), but don't add them unless you actually will use them.
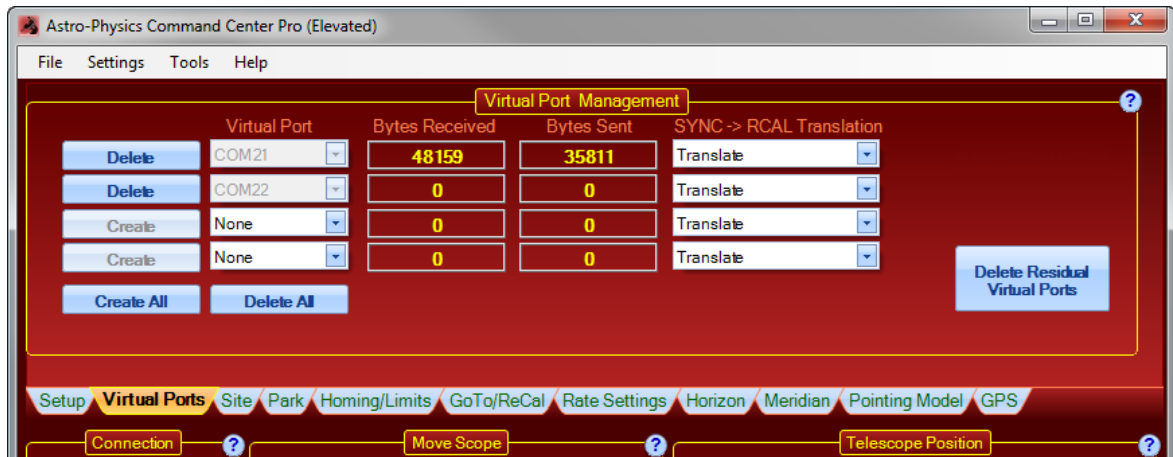
2. Set your desired Park position in the Park Tab. Set the Unpark option in the dropdown list to **Last Parked**. This is the normal Unpark setting for ALL permanent setups. If you are portable, and must reestablish your position at each startup, set this to Park 4. If you just need to reestablish your position this one time in a permanent setup, select Park 4 and then switch back to Last Parked once pointing is established. To resume from Park 4, you will, of course, need to place the mount into the Park 4 position.

3. Create your Horizon Tracking Limits if you will be using them.

4. Create your Meridian Tracking Limits if you will be using them.

5. Configure your Home and Limits (NON-Encoder mounts ONLY!) after you are finished using the clutches.

6. If you have APCC Pro version, we recommend the following:

   a. Establish your Horizon and Meridian Tracking Limits BEFORE doing anything in the Pointing Model Tab.

   b. If time permits, operate your mount normally for a few nights to be sure that you have everything else working the way you want it to.

   c. When you feel ready (or if you simply cannot wait), open the Pointing Model Tab, and then click on the **APPM** button to get started with a pointing model.

If you follow these steps in order, you will have everything set up in a way that most users will find ideal. There are, of course, many additional options and settings in APCC that you can work with, but start with the basics and try to get a good understanding of the program before attempting to use the more advanced features.

2.2   Hardware/Software Requirements

Mount Hardware Requirements:

o Astro-Physics GTO mounts, OEM German Equatorial mounts with GTO Servo System (Parallax Instruments or Mathis Instruments).

o GTOCP4 Control Box or GTOCP3 Control Box with revision "V" or later firmware. Revision V began shipping with all mounts starting at the end of July, 2014. Refer to this information from the Technical Support section of our website. (http://www.astro-physics.com/tech_support/mounts/servo/cp3-chipupgrade.htm)

Minimum Recommended Computer Hardware Requirements:

The whole idea of "minimum computer requirements" for a single application is really no longer valid in today's computer world.   Any computer that can run any of the modern software packages that you will be using with APCC will be adequate to run APCC.   The issue in today's environment is whether your computer can run ALL of the required software SIMULTANEOUSLY to achieve your desired goals.   APCC is unlikely to ever be run as a stand-alone piece of software.   When you consider your computer hardware, aim for a system that can handle all of the observing and imaging software that you plan to use, and that can handle all of it running together.   That being said, here are some general tips and recommendations and a few specific requirements:

o RAM is generally more critical to adequate performance than processing power.   If budgeting for a computer system, spend the money on more RAM instead of the latest and fastest processors with the most cores.   8GB of RAM is probably adequate for an imaging system, but 16GB or more is even better.

o Solid State Drives (SSDs) have recently become much more affordable. They are certainly not a requirement, but are recommended for your boot drive for their robustness, lack of moving parts, and overall speed.   At least 10GB of free drive space (for logs and settings) should be available.

o APCC makes some demands for graphics capabilities, but its demands are generally less than those for either of the two most popular planetarium programs.   If you can run TheSkyX or Starry Night Pro Plus, you have probably already exceeded APCC's minimum requirements. However, for clarity, please note the following:

  ▪ 3D accelerated graphics card or integrated controller recommended if using the 3D Telescope View

  ▪ OpenGL 1.5 or later required (Both planetarium programs mentioned above require higher Open GL.)

  ▪ Note that having multiple graphics-intense applications open on the desktop simultaneously can cause problems if your computer doesn't have some graphics muscle!

o Native serial port, or installed PCI serial card, or USB/serial port converter required.   For USB to serial converters, we recommend the following:

  ▪ [USB to Serial Adapter from FTDI (USB1PFTDI)](#) units (sold by Astro-Physics)

  ▪ High quality units with FTDI chipsets (i.e. Industrial units from serialgear.com like their [2-port](#) or [4-port](#))

  ▪ Industrial USB to Serial converters from [Moxa](#)

  ▪ Converters from [Digi/Edgeport](#)

- Keyspan converters have also been used with success. Beware: Keyspan is now owned by Tripp Lite. Make sure to get the real Keyspan unit and NOT the basic Tripp Lite converter.

- We **CAN NOT** advise using **ANY** converter with a Prolific chip set!

o Network connections - Ethernet or WiFi (optional) for GTOCP4 Control Boxes

Minimum Computer Software Requirements and Recommendations:

o Windows Vista / 7 / 8 / 8.1 / 10   32-bit or 64-bit   Windows 7 Pro 64 bit is our current favorite among OS choices. Note that since Microsoft has abandoned Windows XP, we can no longer recommend or support systems that are running XP.

- Required - Run Windows Update to apply all updates.

- Required - The .Net framework must meet the same requirements that are needed for the latest ASCOM Platform. See below

> NOTE: .Net 3.5 is also required for some of the AP V2 ASCOM Driver's features. Windows 8 and 8.1 do not ship with .Net 3.5 installed and you cannot directly download and install it. Please see this link to enable .Net 3.5 on Windows 8 and later to have full driver functionality:
>
> http://msdn.microsoft.com/en-us/library/hh506443.aspx

o Required - The latest ASCOM Platform installed (http://www.ascom-standards.org) The platform installer will ensure that the various required Windows updates like those for the .Net framework have been installed.

o Required - The latest AP V2 ASCOM Driver installed (http://www.gralak.com/apdriver)

o We recommend that you update your browser to the latest version

o We recommend that you install Adobe Acrobat Reader or another PDF reader (may be needed to read APCC and ASCOM PDF documentation)

Additional Requirement for APCC Pro's APPM Point Mapping Program:

o   The **FULL** version of DC3 Dreams PinPoint application v5 or later (v6 is highly recommended).

o Sequence Generator Pro

OR

o   TheSkyX Image Link

2.3   Installation and Licensing

Preparation

In order to install and run APCC, please ensure following:

1. Make sure that you meet ALL of the requirements in the Hardware/Software Requirements section as described earlier in the Welcome to APCC.

2. You must register a specific e-mail address with Astro-Physics for APCC. This will be the official e-mail address that is associated with your license. **This is required to obtain a trial license key or make a purchase**. When your e-mail address has been entered into our database, you will receive an automatically generated email with the subject line: APCC Email Authorization Sent: (your e-mail address displayed).

3. Download the program from this APCC Download Link

Installation

We strongly advise that you log onto your computer with FULL administrator privileges. This means that you are logged on as the primary owner / operator of the computer with full Windows permissions. Being logged on as administrator is NOT the same as running or installing a program file "as Administrator." _DO NOT_ try to install or run this (or any other) astronomy-related software "as Administrator."

If you are updating from v1.0.3.4 or an earlier version, you must _uninstall_ any previous version of APCC in the Windows Control Panel. This is due to the new version of the Eltima Virtual Ports Driver that will be installed. Be sure then, during the new installation, that the box to Install / Re-install Virtual Ports is CHECKED.

Double-click on the installer file: **APCC_Setup_1.x.x.exe**   or the **APCC_Pro_Setup_1.x.x.exe**   file that you have downloaded to start the installation process. Follow the instructions on the installer. You may need to disable some anti-virus or firewall software before installing.

If this is your first installation of APCC or any installation that includes a new version of the Eltima Software, you will be asked to install the Eltima Software System device driver. You must accept this installation.

> **IMPORTANT NOTE ON THE VIRTUAL PORT INSTALLATION:** **Near the end of the software installation process, a black DOS-style Command window will open.** **DO NOT interfere with this command window! Don't touch anything on your computer, including the mouse or keyboard while this window is up. Doing so may cause a failure of the virtual port system. Please be patient!**
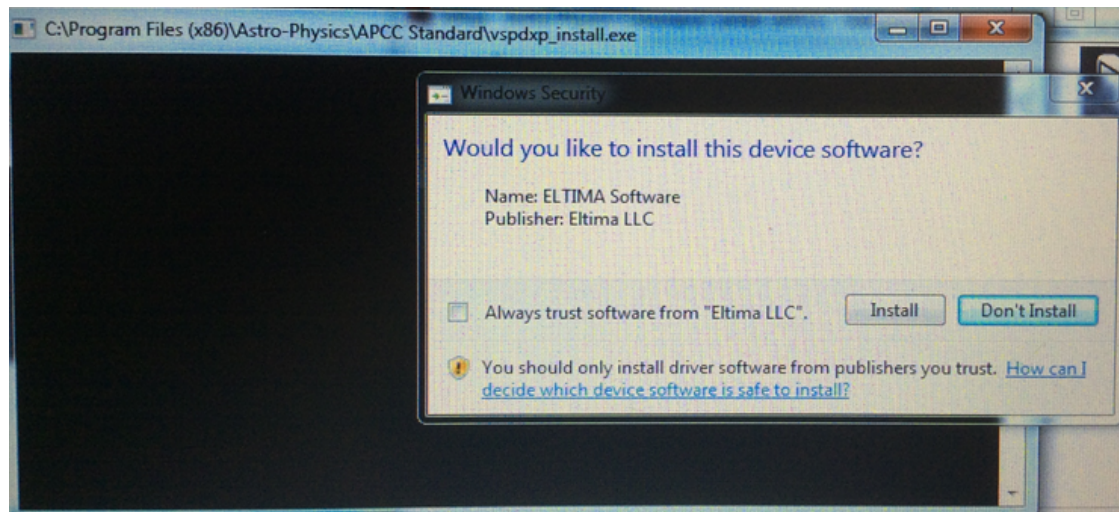
One final note on upgrades from earlier versions. This will apply to all upgrades.

IMPORTANT NOTE:

With successive versions of APCC (or any software), the various associated windows can change in terms of their content and arrangements. If the options regarding Window Size and Window Positions are selected when you install the latest version, you may need to turn the window options off, and then on again after installation to reset properly to the new appropriate window dimensions.

Obtaining a license key

When you run APCC for the first time and until you enter a license key you will be presented with the Trial Registration Information Dialog when APCC starts.

Confirming you have the proper firmware

If you are not sure that your mount has the proper firmware installed then you can check it by clicking **Check for Valid Firmware**. For this to work, you must have the AP V2 ASCOM Driver installed and configured for normal (pre-APCC) operation. The serial cable must be connected from the computer to the mount, and the mount must be powered on. If you can successfully use the Check Port button in the AP V2 ASCOM Driver's Telescope Setup window, then you are set up correctly for this test.

If you don't have the correct firmware installed for this mount, you can click the **Order Firmware** button for more information on how to obtain it.

Obtaining a trial license key or permanent license key if your computer has internet access

You can try APCC for up to 30-days before purchasing. To do so you will need to make sure your e-mail is authorized to receive a trial license key. Authorization is required to ensure that you have the correct firmware and control box, which will help minimize support questions.

To get an authorized e-mail you should contact Astro-Physics via phone or e-mail (support at Astro-Physics dot com) requesting that your e-mail be authorized for the trial. In order to be authorized, you will have to purchase the upgraded firmware (revision "V" or later) if you do not already have this firmware installed in your GTOCP3. Mach1GTO, 1100GTO and 1600GTO mounts shipped beginning July 22, 2014 and later will have the upgraded firmware. Owners of these more recent mounts must still get an e-mail address authorized for the licensing process.

Once your e-mail address has been authorized and entered into our APCC database,you will receive an email with the subject line: APCC Email Authorization Sent: (your em-mail address displayed).

Enter your Name and E-mail address (twice) and click the **Get Trial Key (Via Internet)** button. Make sure that you run APCC on the computer you intend to run it from.

You should receive an e-mail within a few minutes with your trial license key. Just copy and paste all 5 lines of the license key into the text box at the bottom of the window. Do not copy any extra spaces or lines.

If successful, the window will now tell you that you have 30 days remaining in your trial. This window will come up every time you start APCC so you'll know how many days remaining you have.

To begin using APCC click **Start APCC.**

Clicking the PURCHASE LICENSE button will take you to the Astro-Physics e-commerce page for APCC. From there, you can click the appropriate Buy now ! button for the version you wish to purchase. Follow the instructions to complete the purchase. Upon completion of the purchase, you will be sent an e-mail with your full license key.

It is also possible to purchase APCC directly from Astro-Physics by contacting us. If you have made your purchase directly, you will receive a license key via email shortly after your purchase. These license keys are manually generated, so please allow a day or so.

Enter your license key in the same manner as the trial license described above. If you are really smart, a successful registration of a full license will give a message like the following:

Obtaining a trial license key if your computer does not have internet access

If the computer on which you intend to use APCC does not have internet access you can click the **Get Trial Key (Manually)** button. A window like below will appear:
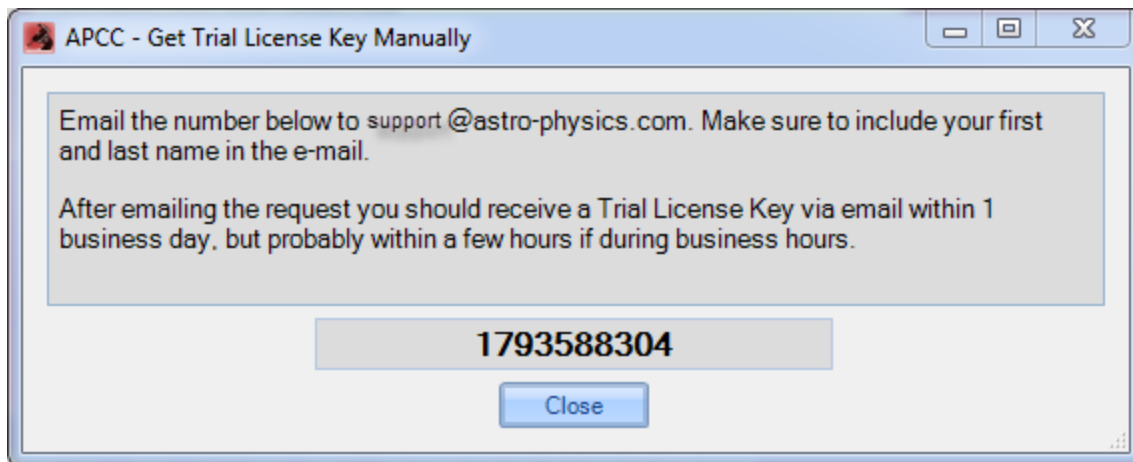
Write down the number and from a computer with internet access e-mail it to Astro-Physics. The staff of Astro-Physics will manually generate the license key for you and send via a return e-mail. This could take 2-3 days since the license key won't be generated over the weekend or holidays. Remember that if you use this method, you must install the trial version of APCC on the same computer from which this number was generated.

After you have entered the license key information, select the **Start APCC** button.

Clearing the license key

If for some reason you need to reenter your license key you can click the **Clear License Key** button. You will then be able to enter a new trial license key the next time you start APCC.

2.4   Setting up your primary Virtual Port

What is a virtual port? Real serial ports are single, unique point to point communication contacts between two, and ONLY two devices. Serial ports, by their nature cannot be shared. Virtual serial ports are software-based rather than physical. Through the Virtual port software, you can effectively create multiple ports that can all be merged into a single entity that can then communicate as a single device to your GTOCP3 servo control box. APCC can create up to four of these virtual ports. The primary port is normally used for the AP V2 ASCOM Driver.

To integrate the AP V2 ASCOM Driver into APCC for seamless operation, you will need to first set up your primary Virtual Port in APCC. This only takes a few moments.

> **Note:** **You can allow APCC to simply set up and create the virtual ports for you by checking the box in the Connection Group Box to "Create Virtual Ports First." However, this may create conflicts if you have other unrelated serial devices that might not be connected or**

> **active at the moment. We have found that it is often safest to set up the primary virtual port manually to avoid these potential conflicts. Hence, the instructions below:**

1. Decide on Port Numbers. Your first task is to determine which ports are already in use on your computer, and to make a good guess at which additional ports may be added. You will certainly have a port reserved for APCC, and you may have additional ports reserved for such things as a focuser, rotator, dew heater controller, weather station, smart UPS or other serial devices. Remember that at setup, you may not have all of these devices connected, and that they therefore may not show up on your system. Use Windows Device Manager to see your current COM Ports. If you use Keyspan USB to Serial converters, the Keyspan Serial Assistant will show you all of the currently connected converters and their assigned port numbers. Otherwise, you can find the assigned ports in Windows' Device Manager.

    As a general rule, most people will reserve port #s 1 through 20 for normal "real" ports, whether native or via a USB to serial converter like the FTDI or Keyspan units. COM 21 is often a good place to start with your primary virtual port. If you use a lot of serial devices, reserve ports 1 - 30 for real ports, and start your virtual ports with COM 31.

2. Open APCC, if it is not still open from your installation. You do not need to be connected to the mount.
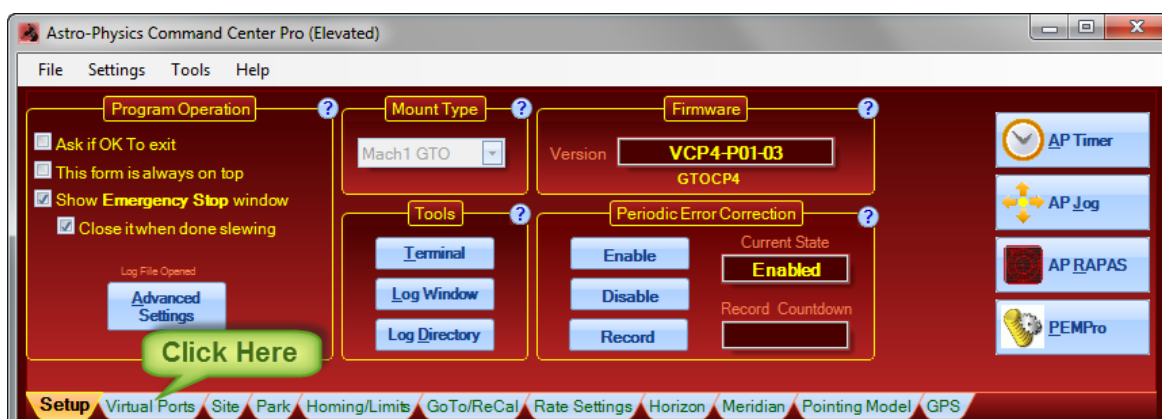
3. Click on the Virtual Ports tab in APCC.

4. Click on the Port Selection Dropdown list for the first (top) virtual port. The default is "None", but all of the available choices will be listed.
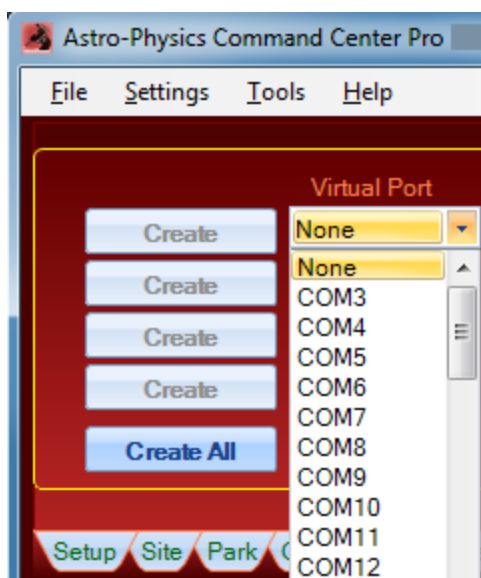
5. Select the COM Port that you decided on in step #1 from the dropdown list

6. **YOU MUST click the "Create" button to create the port in your system!** This isn't simply an APCC option, but goes to the heart of the PC's operating system.
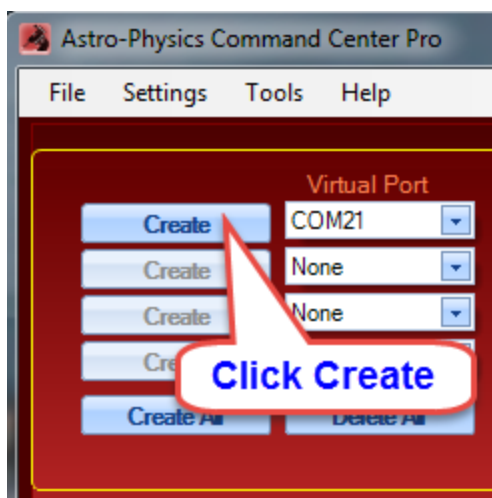
7. Repeat this for the second COM port (i.e. COM 22) and any additional ports you may need. Defining the second port is recommended so that ASCOM client programs that must be run as administrator can have their own instance of the driver.

8. Remember the primary COM port number you just created, and proceed to the next step in these instructions: Setting up the AP V2 ASCOM Driver

9. More information on using the Virtual Ports can be found under the Main Window => Virtual Ports Tab.

2.5   Setting up the AP V2 ASCOM Driver

1. The Driver and the driver's Setup Telescope window must be closed.

2. Click the **Now** button in the AP V2 Driver section of APCC's Connection Group box as discussed in the Getting Started Work Flow section.

Seriously!

That's all that 95% of you will ever need to do!
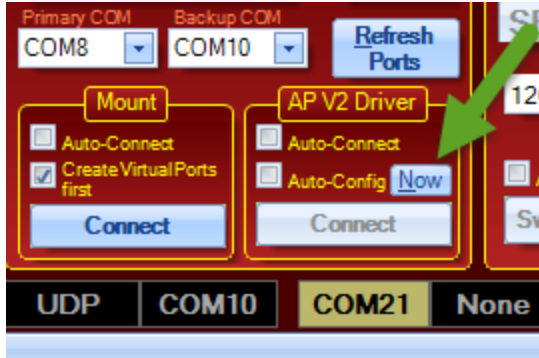

For the remaining 5%

Make sure you have the most recent version of the AP V2 ASCOM driver installed. We encourage you to check the AP V2 ASCOM website frequently for updates: http://www.gralak.com/apdriver in addition to making sure that you have the most recent version of APCC installed.

Note that the recommendations below will occur automatically if the Auto-Configure box is checked in the Connections Group Box!

1. In the ASCOM Driver's Telescope Setup; check the *APCC Virtual Port* option check-box.

2. Make sure that the port number selected matches the top port in APCC's virtual ports.

3. Increase the *Timeout* to 1000, 2000, or even up to 5000 ms if you experience issues when starting directly from ASCOM client software. 1000 or 2000 is probably a good place to start. If using the driver by itself without APCC, I would normally use a much shorter timeout value – maybe 200 to 500ms. However, since APCC is in primary control of the mount, the AP driver may need to wait at times for APCC to do its job before responding. This is especially true at startup where a whole lot of serial traffic is happening all at once. This way, the driver will give APCC time to get the virtual ports started and initialization completed.

4. Set the *Retry Count* to 0.

5. The *Use ASCOM Serial Object* option check-box is un-checked by default. When un-checked, a C++ COMs library will be used. If you experience communication problems, try checking it. In particular, be aware that one or the other may work better during shutdown and/or startup. This preference seems to vary with different computers and USB to serial devices.

See the picture below:

NOTE: The pictures and instructions below reference COM 11. We have since decided that it is safer to start your Virtual Ports at COM 21 to avoid conflicts with existing and future Windows port mappings.
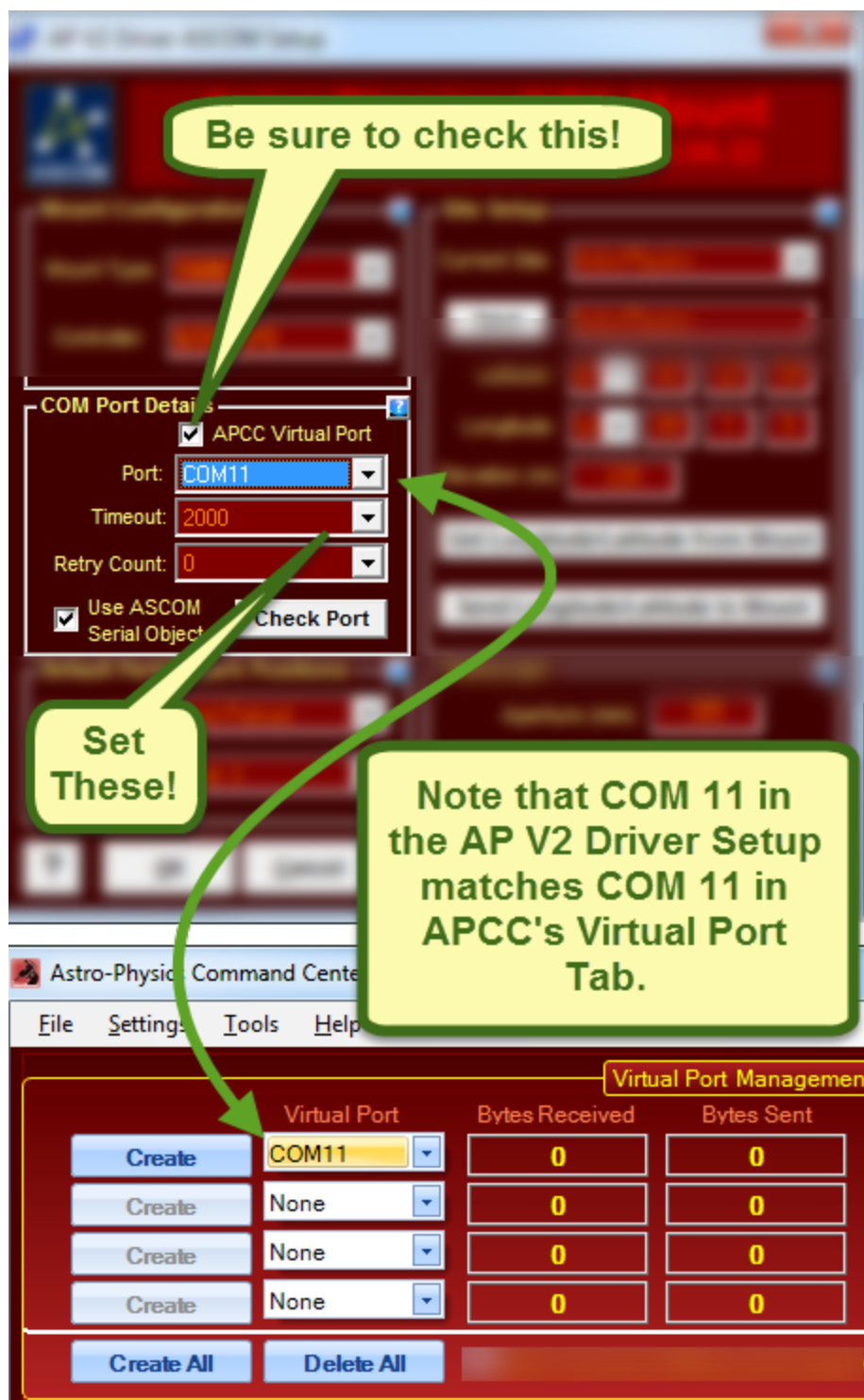
6. When everything is set, you can use the "Check Port" button if you are connected to the mount with APCC. The mount MUST be powered up and connected to APCC for this button to work! You can always check this later. A successful connection will open a small window that says: Mount Found! Firmware V.   A failure will result in a small window that says: Mount NOT Found!
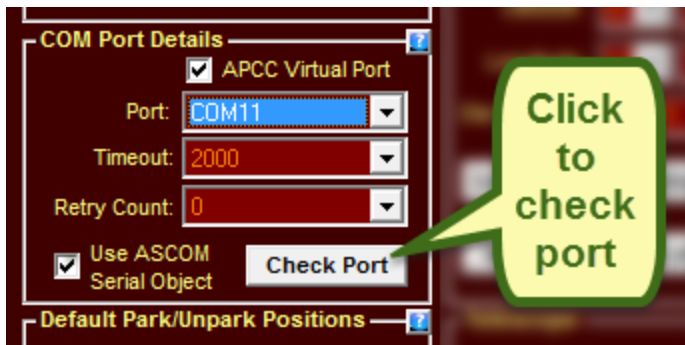
7. Open the expanded Advanced section of the AP V2 ASCOM Driver's Setup window by clicking the button in the lower right corner.

8. Un-check "Calibrate move directions on first slew" since this will be handled by APCC.

9. Set the Connect Timeout to >= 20, or to 0 (0 = never)

You now have your AP V2 ASCOM Driver and your APCC Virtual Ports configured to work together. Additional details and options can be found in the section on the Virtual Ports Tab under the Main Window, and in the documentation for the AP ASCOM V2 Driver.

2.6   Operational Work Flow Basics

Introduction

The earlier section on Getting Started Work Flow was designed to help you get the system up and running. This section will guide you through normal operations as you use APCC with other software to achieve your observing or imaging goals. The steps below are not hard and fast rules. They are guides that, if followed, will present the easiest and most trouble-free way of operating your system as a whole.

Use the AP V2 ASCOM Driver!

First off, the question often arises: If I have a choice between using an external program's native driver (as in TheSkyX), or connecting the software through the AP V2 ASCOM Driver, which should I choose? We strongly advise using the AP V2 ASCOM Driver!   Here are some reasons:

1. The AP V2 ASCOM Driver is a full fledged hub. It will accommodate a very large number of programs all connected at the same time, and will do so without any problems. As a single hub, the driver will minimize the serial traffic between the software and the mount by eliminating redundancy.

2. The AP V2 ASCOM Driver takes advantage of the full set of Astro-Physics servo commands, many of which were developed specifically for either the driver or for APCC. Since these new commands are

not being published, the native drivers found in other software will be limited to the older set of published commands.

3. The AP V2 ASCOM Driver can create log files for troubleshooting any issues that you may have.

4. We can provide a certain amount of support if you encounter issues with a program that uses the AP V2 ASCOM Driver. We, of course, cannot fix a problem that is in someone else's software, but we may be able to figure out what is happening to cause the problem. If you use a native driver, you will be limited to the support that the software provider can give you. We can't support someone else's driver.

Order of Operations

While there are several ways that you can start up and run your system, we recommend the following order of operations:

1. **Power up your imaging camera(s) and software and start the cooler(s).** This is simply a time saver. The cameras might as well be cooling while the rest of the system is being activated.

2. **Power up your mount.**   Since APCC automatically sets the Auto-Park feature in the servo, the mount will not start default sidereal tracking, even if it was not properly shut down at the end of the previous session. The mount will quietly wait in place until it is initialized and unparked by APCC with NO loss of pointing accuracy.

3. **Start APCC**.   If you checked the Auto-Connect When Started box in the Connection group box on the main page, APCC will connect automatically to the mount and initialize it. It will then create all of the virtual ports that you have defined. Finally, if the Auto-Connect Driver when APCC connects box is checked on the Virtual Ports tab it will start up the AP V2 ASCOM Driver and connect to it through the first virtual port.

4. **Connect the imaging software to the mount** if you normally do that. This was added as a separate instruction because we advised you to start your imaging software earlier to cool the camera and we don't want you to forget.

5. **Start and connect other software.** Start up each additional piece of software that you will be using and connect that software to the mount, and to any other relevant devices. Refer to the other software and hardware documentation for advice on the order in which you power other devices like focusers and start the various other programs.

6. **DO YOUR ASTRO-THING!**

Note: Many of you with remote operations will have a scripting program like ACP or CCD Auto-Pilot that will do this for you. If this is the case, we still recommend this basic sequence except that the first thing activated will be the scripting software. Your scripts should include sufficient time (waits) for each element to be completed before proceeding to the next.

If you insist on starting everything from an ASCOM client program (not the preferred method), please note the following: The two checkboxes in the AP V2 Driver section of APCC's Connection group box (Auto-Connect and Auto-Config) must be UN-checked. Also, in APCC's Advanced Settings window: Check Auto-Initialize and set the value to zero.   Check the Auto-Shutdown and set its value to 1 second.

Shutdown

The shutdown sequence is very much the reverse of the Order of Operations listed above with a couple exceptions. Here is the recommended sequence:

1. **Start the imager's cooler warm-up.**   Again, this is listed first as a time saver.   For cameras that require a warm-up, this might as well be going on while the rest of the shutdown is taking place.

2. **Park the mount.** Most of you will choose to park the mount to a predefined park position, even though this is not strictly necessary with an Astro-Physics mount. For many, the park position is dictated by the observatory architecture, or by the positioning of a flat screen. See the Park Tab section for more details. If you are using TheSkyX to park the mount, be sure to see the special note!

3. **Disconnect the imaging software from the mount.** Since the warm-up of the cooler can take a while, the imaging software is often the last piece of software to be closed down before shutting off the computer. You will want to disconnect the imaging software from the mount before closing APCC.

4. **Disconnect and shut down other software.**   Disconnect each piece of software from the mount and any other devices that it controls, and then shut that piece of software down.

5. **Verify that everything is disconnected.**   There are 2 steps to this:

   a. If you have connected to the mount with one or more **NON**-ASCOM programs, go to the Virtual Ports tab and make sure that the only active virtual port is the top one (the AP V2 ASCOM Driver's port). You do not need to delete the other ports that you may have. Just make sure that no further data is being transmitted or received over the lower three virtual ports. If you only connect to the mount through ASCOM clients, you can skip this step.

   b. The AP V2 ASCOM Driver has an indicator at the top of the Handbox Window that tells you how many clients are connected. (See the AP V2 ASCOM Driver's help file.)
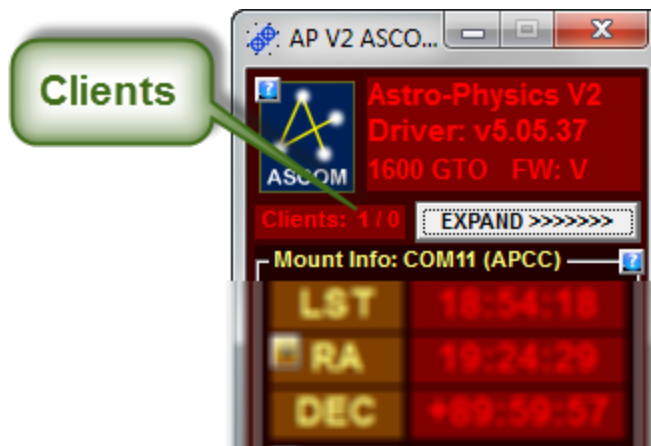
The first value (in the above case a 1) tells you how many client programs are still connected to the mount. The second value tells you how many DC synchronous focusers are connected. (Note: Digital focusers and focusers requiring drivers cannot use the simple AP focus controls and are NOT included in this count. For most of you, the second value will always be a zero.) When the client count gets down to 1, all the programs have been disconnected.   The remaining 1 is APCC. If you have chosen the Auto-Shutdown feature in the Advanced Settings window, the shutdown timer will start when the last client apart from APCC is disconnected.

6. **Close APCC.** If you did not choose Auto-Shutdown as mentioned above, close APCC in one of the conventional ways. When APCC closes, it will also close the last instance of the AP V2 ASCOM Driver. APCC and the driver should be shut down before proceeding to the next step.

7. **Power off the mount.**

8. **Finish closing down your imager and shut down the observatory.**

2.7   Tips to Get the Most from APCC

Using the Help Files and Manual

We have tried to make this information as complete and well organized as possible. If you have suggestions for improving the documentation, please let us know!

This information is available in many formats to suit your situation. We encourage you to refer to these help files first before posting to the forum or calling for support. Please let us know how we can improve the information or presentation to make it easier for all to use.

- Help icons - The Help icons available throughout APCC are likely to be the most handy method for gaining access to information when you need it. Each icon links to the specific part of this manual that explains the feature or function. This puts pertinent information at your fingertips for immediate reference. There are frequent links to other information for further clarification.

- APCC Toolbar - The APCC toolbar includes a Help selection that will open the entire manual for your review in html format. This version includes a search function and allows you to designate sections of the manual as favorites for quick reference at a later date.

- Adobe PDF - If you plan to review the manual at times when APCC is not active, the cross-platform PDF format will be handy. Download it to your computer, print it for reference or upload it to your portable device. If you use it in conjunction with an App like iAnnotate, you can highlight information that you want to remember or make additional notes for future reference.

- Apple iBooks (ePub format) - This handy version can sit on the bookshelf on your iPad or even your iPhone! Naturally, other e-readers in ePub format can be used, as well.

We will make an effort to keep the screen shots updated as minor changes occur in upcoming releases, however you may find some outdated screen shots that look slightly different. Please bear with minor differences. However, if you find screen shots that are confusing and require immediate updating, please let us know.

Instructional Videos

We have prepared some [instructional videos at this link](). The instructional videos are a work-in-progress, and will be continuously updated and improved over time. Please note that some of the videos are already a bit dated and may show screen shots that are no longer current. The basic information contained in the videos, however, should still all be correct.

Help ? in Corner of Group Boxes

In the upper right corner of almost every group box in APCC you'll find a round button with a "?". Clicking this button will open the help for the group box.

Tabs

Tabs provide a quick means to access key areas of the program. You can rearrange the order of the tabs to suit your needs, however the order will not be saved for the next session at this time.

All tabs are visible for all mounts and all versions of APCC with the following exceptions:

- Pointing Model Tab: Only visible for the APCC Pro version.

- ELS Tab: Only visible for 3600GTO

- AE Tab: Only visible for 1100GTO and 1600GTO (Not currently available in the first APCC release. Use the APAE Utility instead.)

Group Boxes

Closely related items are subdivided into Group Boxes enclosed within a yellow box and given a title to describe their relationship. Some of the group boxes, like the Move Scope group box shown below are always visible on the Main Window. Others are organized within the various tabs or windows.

Resizing Windows

For your convenience, the various windows can be resized to suit your needs. Simply grab the lower right corner of the window (or the sides) and move it to fit the desired space. Note that the text and graphics will adjust proportionally to the width or length that you specify. This will allow you to optimize the monitor placement of all of the programs you typically use to enhance your work flow.

When you resize APCC, the controls will scale as well. The scaling of controls and fonts is not always perfect but is usually good enough for most purposes. For instance, you can maximize APCC so that the controls are easily visible from a distance, or shrink APCC so that other Windows are also visible.

If you wish to save the location of the windows when you exit APCC, refer to Settings Menu. Please refer to Known Issues if you are using Windows XP or Vista.

Limit Primary Control of Your Mount to One Input Device

Your mount can be controlled by a variety of input devices, including the Keypad, iPad/iPhone or computer. Although the devices can work together very well to command the movement of your mount, we recommend that you use only one in your session and that you always initialize, unpark and park with the same primary control device. We expect that for most of you, the primary control device will be your PC with APCC. Remove the primary control functions from any other device that you use. For the keypad, this means setting the auto-connect to EXT. Other devices like iPads should have the time-updating functions to the mount disabled, and should not be used during your final park and shutdown routine.

Remember these rules:

- ONLY ReCal from the same device that sent the slew command.

- NEVER perform a full SYNC from a secondary device!!!

This document provides information regarding various options for controlling your mount: [Control Options for Astro-Physics Mounts](#)

3   Initialization /Edit Initialization Window

This window can take two formats: It can appear upon connection to an uninitialized mount immediately prior to initialization, or it can be opened as a savable window from the Settings menu for convenient editing.

Whenever APCC detects that the mount needs to be initialized (right ascension = 0 and declination = 90), the **Initialize Astro-Physics Mount** window will open. By default, if you do nothing, whatever parameters have been set up in this dialog window will execute in a user-defined number of seconds. (Default is 10 sec. See the Advanced Settings section under Main Window => Setup Tab) However, you can stop this auto-initialization by clicking the button **Stop Auto-Init.** This will allow you to check your settings and change them, if you wish. You will NOT normally stop the auto-init sequence.

> **Useful Tip:** Most users will want to select Auto-Initialize from the Advanced Settings Window so that initialization by APCC is automatic. If that option is checked, the window on the left will appear every time you start APCC after power-cycling the mount. Permanent setups where the various options are not likely to change can select a very short wait time in the Advanced Settings window - 1 or 2 seconds is usually fine. Portable users will want to set longer time intervals to allow time

to check settings and possibly temporarily stop the auto-init to make changes.

Initialization Window
Automatic when connecting to uninitialized mount.

Edit Initialization Window
Accessed any time from Settings menu.

Click HERE to stop the Auto-init if needed.

Click HERE to initialize NOW!

Click HERE to SAVE these settings for the NEXT time the mount is initialized.

IMPORTANT: The window on the left above will NOT appear if you have already initialized the mount with another source, like the keypad. Also bear in mind that the mount remains initialized until it is power cycled. Remote observatories that leave power on to the mount (not recommended in case of damaging lightening storms) will maintain an initialized state in the mount and will also not see this window upon startup of APCC.

At any time, you can access the editable version of this window under the Settings Menu to adjust the settings. This should be the normal way to change initialization settings. Re-initializing an already initialized mount with new information can result in changes to the mount's knowledge of where it is pointed. Therefore, the editable version DOES NOT have an initialize button.

Initialization

The primary initialization functions tell the mount its current location and give it the current time and date. The initialization also initiates the "unpark" calculations that re-establish the mount's pointing. For mounts that have been manually moved or set up in the field, the primary initialization functions also can include syncing the mount to a predefined Park position.

Select Site: Selects the site that will be used to initialize the mount. APCC will use the site's latitude, longitude, time zone, elevation, default temperature and pressure. To edit or create new sites, click the *Manage Sites* button.

Manage Sites: Click this button to bring up the Manage Sites Dialog.

Unpark from: This selects the park position from which APCC will unpark. **Usually you will want to select "*Last Parked*." This is true even if you park to a defined park position.**   The only time you would normally unpark from a defined position is if you are setting up the mount or if you have moved the mount via the clutches. Note that you can also select *Don't Unpark* from the drop-down list in case you don't want to unpark when initializing. Refer to the Park 1, 2, 3 and 4 Positions Defined section if you are unsure of the various options.

Unpark Now: Clicking this button will allow you to unpark the mount from one of the Park positions. You cannot use this button if you have *Last Parked* selected. You typically would use this button to unpark after you have physically moved the telescope to one of the Park positions. Refer to the Park 1, 2, 3 and 4 Positions Defined section if you are unsure of the various options.

Optional Initialization

A basic initialization will give the mount the necessary information to calculate its position (time and location data) and will unpark the mount to either its calculated pointing position, or to a user selected pre-defined Park position. You may, however, wish to set other operating parameters as part of your general start-up / initialization process. These other parameters can be set automatically at initialization by checking the boxes and selecting the values in the options listed below.

Note that the the keypad, or any other software can set its own parameters which can override the parameters you set here at initialization. The GTO Servo will always act on the last parameter that it received for any given option below.

- **Set Tracking Rate:** If this option is checked, the selected tracking rate is sent to the mount. If this option is not checked, the mount will begin tracking at the default sidereal rate.

- **Set Guide Rate:** If this option is checked, the selected guide rate is sent to the mount. If this option is not checked, the default guider rate of 1x will be used.

- **Set Move Button Rate:** If this option is checked, the Current rate will display the selected rate. If this option is not checked, the Current setting will display the last entered rate. Note that settings at the direction buttons within APCC, in the keypad and in other software will generally override this rate to whatever rate is in that particular device or software.

- **Set GoTo Slew Rate:** If this option is checked, the selected slew rate will be used for slews from within APCC. If this option is not checked, the default slew rate of 1200x (600x for the 3600GTO) will be used.

- **Set Dec Backlash:** If this option is checked, the backlash value is sent to the mount. If this option is not checked, the default is zero. Remember that backlash settings are generally NOT recommended for most users, and are DEFINITELY NOT recommended if you are autoguiding. They are generally useful only for visual observing or manual guiding with a crosshair eyepiece.

- **Set RA Backlash:** If this option is checked, the backlash value is sent to the mount. If this option is not checked, the default is zero. Remember that backlash settings are generally NOT recommended for most users, and are DEFINITELY NOT recommended if you are autoguiding. They are generally useful only for visual observing or manual guiding with a crosshair eyepiece.

- **Set PEM:** If this option is checked, periodic error correction can be forcibly enabled or disabled during initialization. If this option is not checked, PEM will remain disabled.

Command buttons

Stop Auto-Init: Stops the auto-initialization process. This button is not present in the Initialization window accessed through Settings since it is not needed there.

Initialize: Clicking this button will initialize the mount with whatever parameters you have defined above. If you have stopped the Auto-Initialization to make changes to your settings, this will then complete the initialization process. The rates on the Rate Settings tab will update.

Save: This is the alternate button to the "Initialize" button that is found in the editable version of the Initialization Window that is accessed from the Settings Menu.

Cancel: Clicking this button will cancel the initialization and any changes you have made to the settings will not be saved. You may wish to do this if you will be initializing later after downloading new GPS site information.