RCS X10 Thermostat Plug-in for HomeSeer Beta Version 2.0.105

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Getting Started

1. Install plug-in.
2. Access the plug-in's configuration by using one of the following two methods:
   a. Clicking on Options menu item of the ***RCS X10 Thermostat*** menu within HomeSeer® Windows Interface.
   b. Accessing HomeSeer web at http://myhomeseerweb:port/rcsX10_config.
   c. Open the HomeSeer® Options dialog from the View menu, select the Interface tab and then select ***RCS X10 Thermostat*** from the *Active Interfaces* list and clicking on the Setup… button.
3. Add Thermostats to plug-in.
   a. Specify X10 house code used by thermostat.
   b. Specify the model of RCS X10 thermostat.
   c. Specify *Location* of thermostat to be used within HomeSeer.
   d. Specify *Name* of thermostat to be used within HomeSeer.
   e. Click the Add button when done.
   f. Repeat for other RCS X10 thermostats that you wish to add.
4. Specify plug-in options by navigating your browser to http://myhomeseerweb:port/rcsX10_options. You could also select the *RCS X10 Thermostat* menu and then select Options menu.
   a. Specify whether user want to use Celsius or Fahrenheit.
   b. Specify whether user wants HomeSeer to use a Windows interface in addition to the web interface.
   c. Specify how often user wants the web interface to refresh to provide up-to-date settings from thermostat.
   d. Specify whether user wants logging of thermostat settings changes disabled.
   e. Specify whether user wants Debug Mode enabled.
5. Configure each thermostat by displaying the *Thermostat Control Interface*. Navigate your browser to http://myhomeseerweb:port/rcsX10_control?housecode=$ (where $ is the house code of the thermostat) to use the web interface or select the *RCS X10 Thermostat* menu to select the Windows interface. Then select the menu item with the name of your thermostat. Right-click on the Thermostat Control Interface to:
   a. Cancel initialization of a thermostat or perform a manual initialization.
   b. Right-click on the *Thermostat Control Interface* to access thermostat properties.

i. Location
ii. Name
iii. Heat setpoint
iv. Cool setpoint
v. Absolute minimum setpoint
vi. Absolute maximum setpoint
vii. Filter Reminder
viii. Heat Pump Recovery Mode
ix. For TXB16 thermostat, specify whether to use hardware dual setpoints.
x. For TXB16 thermostat, specify whether to use independent retrieval of heat and cool setpoints during
initialization and polling. Make sure that your firmware version supports this and that you have also enabled hardware dual setpoints.
xi. For TXB16 thermostat, specify whether stat should change thermostat mode to force .
appropriate heat/cool setpoints (necessary if stat is in AUTO mode). Note that this will potentially cause HVAC unit to temporarily turn on using an undesired mode.
xii. Enable/Disable *AUTOSEND Mode*

> From the RCS X10 Thermostat Bi-directional Protocol Manual, "The AUTOSEND mode enables the controller to automatically send a message each time there is a change in temperature/setpoint/fan mode. A report of temperature change is preceded by a “Temp Change” Unit 6 level 9 report status message and a report of change in setpoint is preceded by a “Setpoint Change” Unit 6 level 10 report status message. The temperature or setpoint value is represented as a preset level in the Report Temperature group in Unit Codes 11-16.

xiii. Enable/Disable *ACK MESSAGE Mode*

> From the RCS X10 Thermostat Bi-directional Protocol Manual, "When this message acknowledgment mode is activated, an RCS product that receives a valid X-10 message will transmit an acknowledgment message in the form of the standard X-10 “Status” message. The ACK responses are as follows:
>
> Status = ON, message received and command completed.
> Status = OFF, message received but command not completed successfully.
> No ACK back, message invalid or not received.

xiv. Enable/Disable *ECHO COMMAND Mode*

> From the RCS X10 Thermostat Bi-directional Protocol Manual, "This message acknowledgment method echoes commands back. It uses the Preset Dim format and only works with the Preset Dim Commands in Unit Codes 1 to 4. When a Preset Level Command is received it is acknowledged by being echoed back as the same preset level on a different unit code. For instance, a Setpoint temperature transmitted as a Unit Code 1-3 Preset Level is echoed back in the corresponding temperature Preset Level in the REPORT TEMPERATURE Unit Codes 11-16. A Unit Code 4 Send Command Preset Level is echoed back as the same Preset Level in Unit Code 10."

xv. Enable/Disable *SAFE COMMAND Mode*

> From the RCS X10 Thermostat Bi-directional Protocol Manual, "To insure that commands which may have become garbled in transmission do not cause erroneous actions, a SAFE COMMAND Mode is available. When activated, no command will be acted on unless it is received twice within a 2 second period. Use of this mode, in conjunction with message acknowledgment, can insure fail safe communications." Note that this mode is no longer supported in later versions of the TXB-16 thermostat firmware. Refer to your user manual to see if this mode is still supported.

6. Work with thermostats
   a. Control thermostats using Thermostat Control Interface.
   b. Control thermostats via HomeSeer status page.
   c. Create HomeSeer events that trigger based upon thermostat setting changes.
   d. Create HomeSeer events that perform actions to control thermostats.
   e. Create scripts using the plug-in's scripting interface as documented in the API.

Using the *Thermostat Control Interface* to Control Your Thermostat

The ***Thermostat Control Interface*** is designed to mimic the functionality of the RCS X10 thermostat's Wall Display Unit (WDU). Pressing up or down button once will display setpoint is shown. Subsequent presses will either increment or decrement setpoint. Holding the button down causes the setpoint to change more quickly. The setpoint value is limited based upon the thermostat model according to the RCS manual. Three seconds after user has quit adjusting setpoint, the new setpoint is will then be used. Note that the system may or may not respond immediately unless the criteria specified by the RCS manual are met:

> "In the HEAT mode, the heating system will be turned on at one degree below the setpoint and will turn off at the setpoint. In the COOL mode, the cooling system will be turned on at one degree above setpoint and will turn off at the setpoint. In the AUTO mode, the current heating or cooling operating mode will operate as usual with the one degree setpoint control. In order for the system to change operating mode from heating to cooling, the temperature must rise two degrees above setpoint."

Right-click on the ***Thermostat Control Interface*** to configure the thermostat.

Additional Notes

- General
  - References to "Preset Level" are equivalent to X10 preset dim + 1 to be consistent with RCS documentation that refers to Preset Levels 1 to 32.
  - For the web interface, polling is performed at a rate specified by WebPollingInterval (default=30 sec) either via configuration setting or querystring parameter.
  - When the Thermostat API GetXXXX(x, y) commands are used, the value returned is the currently stored value.
  - When the ThermostatGetXXXX commands for a given thermostat are

called directly, there is an optional parameter available to have the value polled.
    - Note that RCS X10 thermostats do not support multiple interfaces so the Thermostat.GetXXXX commands use a default interface parameter of 1.
- AUTO Mode
    - AUTO Mode and use of dual setpoints involves an assumption regarding current mode.
    - The plug-in assumes that if the current temperature is more than two degrees above the COOL setpoint, then the thermostat must be in COOL mode.
    - If the current temperature is more than two degrees below the HEAT setpoint, then the thermostat must be in HEAT mode.
    - All other values result in the plug-in storing HEAT and COOL setpoints and not acting on them. This is necessary since the RCS X10 thermostats do not report an *actual* thermostat mode while in AUTO.
- Hold Mode
    - Implemented via software since RCS X10 thermostats do not support it as a hardware setting.
    - If enabled, Hold Mode will prevent all plug-in changes to thermostat settings. It will NOT prevent changes made at the Wall Display Unit.
    - User can still change thermostat manually. User could also change via direct ExecX10 commands.
- Heat Pump Recovery Mode
    - If enabled, Heat Pump Recovery Mode limits physical setpoint changes to one degree (two degrees if in AUTO mode) at a time until desired setpoint is reached. This helps to prevent use of auxiliary heating when desired heat setpoint is much higher than the current temperature
    - If disabled, physical heat setpoint goes immediately to desired heat setpoint.
- Dual Setpoint Control
    - Unlike the TXB16 which natively supports separate heating and cooling setpoints, separate HEAT and COOL setpoints for the TX15-B are implemented via software.
    - The separate setpoints can be directly changed via the CmdSetHeat and CmdSetCool commands.
    - When working within the Windows or Web Interface, the following strategy is used:
        - Thermostat Mode Change

          If Model is not a TXB16 with hardware dual setpoint control enabled

If change is to HEAT

then set thermostat's current setpoint to the plug-ins internal heat setpoint setting.

If change is to COOL

then set thermostat's current setpoint to the plug-in's internal cool setpoint setting.

- Current Setpoint Change

  If thermostat's current mode is HEAT

  then set plug-in's internal heat setpoint setting equal to the new setpoint

  If thermostat's current mode is COOL

  then set plug-in's internal cool setpoint equal to the new setpoint

- Heat Setpoint Change

  Set plug-in's internal heat setpoint setting to new value

  If current mode is HEAT

  then set thermostat's current setpoint to new value

  Otherwise if Change Thermostat Mode for Dual Setpoints is enabled (TXB16 only)

  then temporarily change mode to HEAT

  then change thermostat's current setpoint to the new value

  then change mode back to original mode

- Cool Setpoint Change

  Set plug-in's internal cool setpoint setting to new value

  If current mode is COOL

  then set thermostat's current setpoint to new value

  Otherwise if Change Thermostat Mode for Dual Setpoints is enabled (TXB16 only)

  then temporarily change mode to COOL

  then change thermostat's current setpoint to the new value

  then change mode back to original mode

FAQ

Q. What is involved in initialization and how does it differ from polling?

A. I will answer the second question first. Initialization and polling both send commands requesting information from the thermostats. This is done to ensure that the plug-in has the most up-to-date information especially when HomeSeer and the plug-in have not been running. While running, polling becomes less necessary if AUTOSEND Mode is enabled since this mode provides info on changes made. For Setback Mode users, polling may still be useful because AUTOSEND Mode does not provide information on Setback Mode changes.

Since initialization occurs at startup (or by user request if deemed necessary), more steps are involved as this ensures that no major changes to the thermostat settings were made while HomeSeer and the plug-in were not running. There are 12 initialization steps and 7 polling steps. Both are show below with the polling steps shown in bold:

1. **Current temperature retrieved**

2. **Current thermostat mode retrieved**
3. **Current setback mode retrieved**
4. **Current fan mode retrieved**
5. **Current setback delta retrieved**
6. **Heat setpoint retrieved (see dual setpoint control)**
7. **Cool setpoint retrieved (see dual setpoint control)**
8. Hardware dual setpoint set (TXB16 only)
9. *ACK MESSAGE Mode* set to Off or set to ON and confirmed as ON - only on 3rd and final initialization attempt
10. *ECHO COMMAND Mode* set to Off or set to ON and confirmed as ON - only on 3rd and final initialization attempt
11. *SAFE COMMAND Mode* set to Off or set to ON and confirmed as ON - only on 3rd and final initialization attempt
12. *AUTOSEND Mode* set to Off or set to ON and confirmed as ON - only on 3rd and final initialization attempt

Q. What are the *ACK MESSAGE Mode, ECHO COMMAND Mode, SAFE COMMAND Mode,* and *AUTOSEND Mode*?

A. The RCS X10 Thermostat manual does a good job of explaining these modes but I will briefly describe them and mention how they are used within the RCS X10 Thermostat Plug-In.

The plug-in uses all of these modes which, in unison, help to ensure failsafe operations of your X10 thermostat. There is one caveat to this in that some systems seem to not be compatible with the use of some or all of these settings. Obviously in those cases, the modes become detrimental. At this time, a complete explanation of what systems may experience this is unavailable so the user must use trial-and-error at this time.

When *SAFE COMMAND Mode* is enabled (not available with later firmware versions of the TXB16 thermostat), commands must be sent twice within a 2 second timeframe before the thermostat processes the command. *ACK MESSAGE Mode* confirms commands sent to the unit by sending back a J Status On command (where J is the thermostat's housecode). The ECHO COMMAND mode causes commands to be echoed back as another method of confirming receipt of the command. ACK and Echo are used together as some commands require ACK mode as they are not echoed back. These commands can be enabled/disabled by right clicking on the *Thermostat's Control Interface*.

Q. What message and command modes must be enabled?

A. None really which would make the plug-in not much different than the original thermostat scripts. To maintain the ability of the plug-in to confirm commands sent, *ACK MESSAGE Mode* or *ECHO COMMAND Mode* needs to be enabled. To have the plug-in automatically report changes occurring at the thermostat (temperature change or someone manually changes setpoint), then *AUTOSEND Mode* needs to be enabled. If *AUTOSEND Mode* is disabled, then a faster polling time would effectively perform the same function albeit it would not be nearly as "instantaneous". *SAFE COMMAND Mode* should be enabled if your system tends to cause HomeSeer to receive spurious commands.

Note that some users have been unable to operate their stats with one or more of the message/command modes in which case those modes should be turned OFF. The *SAFE COMMAND Mode* is notoriously bad on some systems but I have successfully used all four modes for many months with both RCS TX15-B and TXB16 X10 thermostats.

Q. How does the plug-in differ from the original thermostat scripts?

A. The plug-in takes full advantage of the use of HomeSeer events including triggers, actions, and conditions. Plug-In devices are created that allow a quick glance of the status of several important thermostat settings. The plug-in also provides a GUI for controlling your RCS X10 thermostats. The interface is designed to have the same look-and-feel as the Wall Display Unit (WDU) for your thermostat.

Additionally, the plug-in has some behind the scenes differences when compare to the thermostat scripts. Below are some of those differences:

- Plug-In uses AUTOSEND mode (there was at least one thermostat script that used this) - this increases preset dim traffic and I cannot control when stat is sending the info. User can disable if necessary.
- Plug-In uses *ACK MESSAGE Mode, ECHO COMMAND Mode, and SAFE COMMAND Mode*. All can increase preset dim traffic but the plug-in has some control over spreading the commands apart by putting a delay between commands being sent. *SAFE COMMAND Mode* has the benefit of preventing spurious changes bu some users have reported problems with it and I suppose it is not needed if you never had problems with spurious commands when running a thermostat script. All of these modes can be disabled by user.
- Plug-In performs an initialization which is where the most user reported problems have occurred. Although plug-in can use polling, it is designed to rely on AUTOSEND. Thermostat scripts used polling.

Q. What type of information logging is performed by the plug-in?

A. There is normal logging and logging that provides information for debugging. Normal logging includes reports for changes to thermostat settings. This can be disabled within the Thermostat Properties. For debugging, there are two debug modes: simple and advanced. The advanced debug mode includes event queue processing information. Debug Mode is enabled via the Plug-In Options.

Q. Can I manually send commands to the thermostat?

A. Yes. You can send commands using HomeSeer's Control Panel but realize that HomeSeer uses *Preset Dims 0 31* while the RCS X10 thermostat manual refers to *Preset Levels 1-32*. This means that you need to subtract 1 from the value in the RCS *Preset Level* table. Note that you can also send Unit ON/OFF commands from a X10 mini-controller or X10 remote. The function that the unit code commands perform depends upon the selected *Decode Table* (refer to RCS manual).

Q. What are the the dual setpoint options for TXB16 thermostats?

A. "Enable hardware dual setpoints" was added to ensure that the TXB16 stats had been set to use hardware dual setpoints. When enabled, the plug-in should be able to better distinguish between setpoints by taking advantage of Cool Setpoint changes and Heat Setpoint changes reported by AUTOSEND mode. "Firmware supports ..." is for TXB16 firmware that has commands to explicitly retrieve heat and cool setpoints. "Temporarily Change..." is for TXB16s to overcome the lack of a explicit commands to **SET** heat and cool setpoints. Are these needed? Not necessarily. It depends upon whether you wish the hardware settings to be maintained in the event that HomeSeer and this plug-in are not running.

Q. What is the plug-in strategy for handling *Thermostat Modes*?

A. The plug-in uses the following logic for *Thermostat Mode*:

- If in Auto Mode, the plug-in tries to does the following check:
  - If Current Temperature is more than two degrees above Cool Setpoint then plug-in assumes Cool Mode.
  - ElseIf Current Temperature is more than two degrees below Heat Setpoint then plug-in assumes Heat Mode.
  - Else the plug-in considers mode to be UNKNOWN.
- If in System Off Mode, the plug-in considers mode to be UNKNOWN.

Q. What is the plug-in strategy for handling *Setback Mode*?

A. As of Version 1.2.2, the plug-in uses the following logic for *Setback Mode*:

Setback Mode is Off

- Adjusting *Current Setpoint* while mode is *Cool Mode* or mode is UNKNOWN causes *Current Setpoint* to change and stores the value as the new *Cool Setpoint*.

- Adjusting *Current Setpoint* while mode is *Heat Mode* or mode is UNKNOWN causes *Current Setpoint* to change and stores the value as the new *Heat Setpoint*.
- Adjusting *Cool Setpoint* while mode is *Cool Mode* or mode is UNKNOWN causes *Current Setpoint* to be changed to the *Cool Setpoint*.
- Adjusting *Heat Setpoint* while mode is *Heat Mode* or mode is UNKNOWN causes *Current Setpoint* to be changed to the *Heat Setpoint*.

Setback Mode is turned On

- Plug-in shows that *Setback Mode* is ON. *Heat Setpoint* and *Cool Setpoint* are left unchanged.
- Current Setpoint[/i] is decrease by *Setback Delta* when thermostat is in *Heat Mode* and is increasted by *Setback Delta* when thermostat is in *Cool Mode*.
- *Setback Mode* indicator blinks.

Setback Mode is On

- Adjusting *Current Setpoint* while mode is *Cool Mode* or mode is UNKNOWN causes *Current Setpoint* to change and stores the value as the new *Cool Setpoint* and disables *Setback Mode*.
- Adjusting *Current Setpoint* while mode is *Heat Mode* or mode is UNKNOWN causes *Current Setpoint* to change and stores the value as the new *Heat Setpoint* and disables *Setback Mode*.
- Adjusting *Cool Setpoint* while mode is *Cool Mode* or mode is UNKNOWN only causes the new *Cool Setpoint* to be stored.
- Adjusting *Heat Setpoint* while mode is *Heat Mode* or mode is UNKNOWN only causes the new *Heat Setpoint* to be stored.
  Setback Mode is turned Off
- If mode is *Cool Mode*, force stored *Cool Setpoint* as new *Current Setpoint*.
- If mode is *Heat Mode*, force stored *Heat Setpoint* as new *Current Setpoint*.
- If mode is UNKNOWN, do nothing

Revision History

- Version 0.4.0
  - Fixed View|Options|Interfaces url bug
  - Fixed menu item unregistering bug
  - Fixed inability to remove Plug-Ins menu if created by HS
  - Fixed setback mode X10 code error
  - Fixed Decode Table P log entries
  - Fixed Filter Reminder not changing
  - Fixed increasing/decreasing temp setpoint
  - Popup window move cursor release
  - Fixed Web UI thermostat poller
- Version 0.4.1
  - Fixed setting thermostat mode to OFF

    - Improved dual setpoint control for TX15-B
- Version 0.5.0
    - Fixed event trigger bugs
    - Fixed a myriad of other minor bugs
    - Implemented two strategies for polling thermostat via web page (see Notes above)
- Version 0.5.8
    - Fixed bug that resulted in repeated plug-in initialization notifications
    - Added absolute minimum and maximum setpoint temperatures to Thermostat Properties
    - Added housecode to upper left of Windows Interface in case user has multiple interfaces open at one time
    - Added ability to disable various command modes via configuration file tweak
    - Added small browser control for Web Interface when plug-in accessed locally
    - Added message when plug-in installed to remind user to disable existing thermostat scripts (heidner)
- Version 0.6.0
    - RCS X10 Thermostat Event actions are now working
    - FailSAFE COMMAND modes (SAFE,ACK,ECHO) can be tweaked and thermostat reinitialized without restarting HomeSeer
    - Default command confirmation timeout is 10 seconds and there are 2 retries before failure is declared
    - Disabled ability to place menu items within "Plug-Ins" menu as this did not seem to be fully support by current versions of HS
    - Added "Init_Attempts" and "Init_Successes" entries to hspi_rcsX10therm.ini so that user can determine initialization performance.
    - Plug-in is now supplied with rcsX10_processor.asp file rather than creating file dynamically. This will allow updates to the processor page to be released without requiring a new build of the plug-in.
    - rcsX10_processor.asp page now handles form submission
- Version 0.6.1
    - Safe, Ack, and Echo are forced OFF in this build.
    - Found and fixed and X10 event queue bug
    - When Debug Mode is enabled, plug-in uses hs.ExecX10 to send commands but when disabled the plug-in uses hs.ExecX10NoLog (no log entries will be written when X10 commands are sent by HS over powerline)
- Version 0.6.2
    - Reinitialization and stopping initialization can be done via right-click context menu when Windows interface for thermostat is displayed.
    - Added support for Decode Table B.

    - Improved initialization to better handle conditions where Safe, Ack, and Echo are not enabled.
    - OperationalMode function improved. Operational Modes are now associated with any event that has uses RCS X10 Thermostat actions. So, if one were to create and event named "Summer Weekend" that enabled Cool Mode and brought thermostat down, "Summer Weekend" would be considered an Operational Mode.
- Version 0.6.3
    - Found a bug with Preset Dim 0 commands
    - Improved automatic polling function
    - Ack, Echo, and Safe mode can now be enabled via right-click context menu when Windows interface for thermostat is displayed. They are still disabled by default unless user changes them.
- Version 0.6.6
    - More improvements to thermostat X10 event handling
    - Fixed a bug with the report of a dual setpoint value
    - Added menu item for Windows Interace that will allow all thermostats to be shown.
    - Both Windows and Web Interfaces use a right-click context menu to access more thermostat features. Thermostat Properties and Thermostat Log are now accessed via this menu rather than via icons.
    - Fixed ability to move Thermostat Log and Thermostat Properties windows for Web Interface
    - Windows interface now supports placement of thermostat interface on an extended desktop when using multiple monitors.
    - Web interface now supports placement of thermostat interface on Active Desktop. In addition to specifying the house code, you need to specify "rawpage=true" as part of querystring (e.g., http://homeseer/rcsX10_control?housecode=J&rawpage=True).
- Version 0.7.44
    - Fixed bug with configuration file settings that was forcing fail safe modes to incorrect settings
    - Config and Options menu items fixed
    - Received X10 events are now handled immediately rather than queued
    - Sent X10 events are now handled by a queue processed at the individual thermostat level rather than at the plug-in level.
- Version 0.8.X
    - Fixes to initialization routines.
- Version 0.9.1
    - Fixed bug with adjusting setpoint by one degree increase/decrease (via "Cool Up/Cool Down" and "Heat Up/Heat Down" commands). Needed to create CmdSetTempAdjust command to handle these functions. Also created corresponding CmdSetHeatAdjust

and CmdSetCoolAdjust functions.

- Version 0.9.3
  - Improvements to polling routines. A zero (or empty field in GUI) poll time disables polling.
  - Removed thermostat script warning since Updater already displays that warning.
- Version 0.9.4
  - Added support for non bi-directional thermostats.
- Version 0.9.5
  - Fixed ACK, Echo, Safe, and AUTOSEND mode settings not being read from config file during startup.
  - Decode table can now be selected via menu.
  - Renaming a thermostat also fixes any associated events.
  - Fixed setpoints not being correctly limited to user absolute values.
  - Fixed some bugs with heat/cool setpoints.
  - Web interface no longer uses popup form processing and instead uses a hidden frame form processing. This should provide a cleaner look and feel and not require popup blockers to be turned off.
- Version 0.9.8
  - Improvements to logic for sending commands to thermostat.
  - Fixed loss of thermostat name when editing thermostat properties via Windows interface.
  - Added better error checking to web interface.
  - Warning and error messages cause thermostat log window to automatically display.
  - Improved thermostat windows interface right-click contextmenu display.
  - Added a message to both windows and web interfaces to indicate whether thermostat is initializing.
  - Web interface will now properly indicate setback mode.
- Version 1.0.0
  - Release version
- Version 1.0.2
  - Made changes to fully comply with Thermostat API. See Notes above for more info.
  - Added a Thermostat.PollStat function
  - OperationalMode renamed to SettingsMode to avoid confusion with OperatingMode (confused already?)
  - Fixed event action and trigger validation for temperature values.
  - Fixed problem with Heat/Cool setpoint confirmation when using CmdSetTemp.
  - Fixed bug with Hold mode setting at startup
  - Failure to set Ack/Echo/Safe/AUTOSEND modes is now logged as a "Warning" rather than as an "Error"

    - When in debug mode, initialization succcess rate and initialization time for each thermostat is logged
- Version 1.0.3
    - Fixed bug with Heat Pump Recovery Mode being incorrectly enabled.
    - Fixed bug with event condition check.
    - Added hidden frame form processing which provides cleaner operation of web interface as it does not require entire page to be refreshed. It can be enabled through the Plug-In Options.
    - Added ability to specify heat and cool setpoints and heat pump recovery mode within Thermostat Properties.
    - Numerous improvements to web interface.
    - Abandoned use of 1 degree setpoint change commands (CmdSetTempAdjust, CmdSetHeatAdjust, CmdSetCoolAdjust). Plug-In will still respond 1 degree changes using Unit Code commands or Preset Dims sent by Control Panel but will not send them to the thermostat. These commands could not be reliably controlled in a manner that would prevent multiple instances.
- Version 1.0.6
    - Improved communications between plug-in and thermostat resulting in faster response times.
    - Fixed problem with Options and Config. These would open and quickly close on some systems.
    - Safe mode is OFF for new installs and should only be enabled if user wishes it to be enabled.
- Version 1.0.8
    - Fixed some error messages that kept some commands from being confirmed even though commands were being executed.
- Version 1.1.0
    - Plug-In is now an Active EXE rather than an ActiveX Control which means that it runs in its own thread which means that you can give it a three-finger salute and not shutdown HomeSeer.
    - Fixed a bug that resulted in "Unable to add command to X10 event queue" errors that were reported on some systems.
- Version 1.1.3
    - Made some changes to the way thermostats are initialized. Non-X10 related settings for thermostats are completed immediately when HomeSeer starts up rather than being delayed.
- Version 1.1.10
    - Fixed stalling issues with Thermostat's web interface
    - Fixed inability to move Thermostat's Windows interface

    - Fixed problem with Safe Mode being off but reported on
- Version 1.1.11
    - Fixed delays associated with execution of events and button presses
    - Plug-in device control menus are now synched with current values
    - Added more error trapping
    - GetModeSet now correctly returns 0 for System Off, 1 for Heat, 2 for Cool, and 3 for Auto
    - Thermostat temperatures are now used as plug-in device values to facilitate creating of conditional triggers
- Version 1.1.15
    - There are now conditional triggers for filter reminder, setpoints, and temperatures that are more inituitive than directly using device values
    - Fixed display of Action Trigger and Condition strings
    - Buttons for Heat Up/Down and Cool Up/Down have been replaced with ability to directly set setpoint
- Version 1.1.16
    - Fixed ability to directly set setpoint values
- Version 1.1.18
    - Fixed DATA folder errors occurring with new installs
    - Fixed bug with adding a thermostat
    - Fixed some bugs with Conditions
    - Fixed a bug reported for some events not being able to be added to event queue
- Version 1.1.19
    - Improved Conditions support
- Version 1.1.20
    - Simplified scripting interfaces and improved its performance
    - Fixed a setback delta confirmation bug
- Version 1.1.21
    - Improved temperature unit change functionality
    - Fixed Settings Mode selection bug
    - Fixed web interface bug
    - Fixed some issues with thermostats not showing in Windows interface menu
- Version 1.1.22
    - Fixed bugs with direct device control of thermostat settings
- Version 1.1.23
    - Improved look of thermostat control interface buttons
    - Added ability to disable logging
    - Polling bug fixed
    - Config and Options dialogs within Window's interface now close when Add/OK button

or Cancel button is selected

- Version 1.1.24
  - More polling improvements. Note however that if AUTOSEND is enabled, then polling can be disabled
  - Improved refreshing of web thermostat control interface
- Version 1.1.28
  - Improved command control processing to reduce scripting and web lockups
  - The thermostat's name is shown as a tooltip text when mouse is hovered over the housecode displayed on the Thermostat Control Interface.
  - Fixed a heat/cool setpoint bug.
  - Fixed a bug where failed polling would keep retrying. Polling now stops after three failed attempts.
  - Fixed a bug where a forced pol via PollStat would not work.
- Version 1.1.29
  - Fixed trigger for Cool Setpoint less than ##
- Version 1.1.38
  - Improvements to web interface response time.
  - Fixed some web control bugs.
  - Another attempt to allow use of ACK MESSAGE Mode for command confirmation when thermostat does not support ECHO COMMAND Mode
  - Fixed web fan mode control issue.
  - Fixed a Settings Mode bug.
  - Fixed a command confirmation error.
- Version 1.1.43
  - Fixed "Control device via menu" and "Control device via web" problems with Setback Mode
  - Fixed a Heat Pump Recovery Mode bug
  - Added CmdSetFanDate
  - Added "All Thermostats and "Becomes Initialized" conditions
  - Fixed "Temperature Increases", "Temperature Decreases" and "Thermostat Mode Changed" triggers
  - The device strings of heat and cool setpoints are now shown within square brackets. If the current mode is HEAT, then the heat setpoint value is prefaced with the current setpoint adjusted by the setback delta value (0 if Setback Mode is Off). If the current mode is COOL, then the cool setpoint value is prefaced with the current setpoint adjusted by the setback delta value (0 if Setback Mode is Off).
  - Fixed a CheckX10Command error.
  - Plug-In now monitors HS log to further increase command confirmation reliability.
- Version 1.1.46

    - Added 2 second gap between commands being sent from two different thermostats.
    - Fixed "Waiting..." message bug.
    - Fixed device value bugs.
    - SettingsMode plug-in device value is now 0 if Settings Mode is still using same settings and the device value is 1 if at least one of the settings has changed (device string will have an asterisk).
    - Attempted to fix mode jumps.
- Version 1.1.47
    - Fixed "Waiting..." message bug.
    - Fixed double "Becomes Initialized" event triggering.
    - Improved beta version installer to prevent HomeSeer hangs.
- Version 1.1.48
    - Command processing improvements to eliminate mode jumping.
- Version 1.1.49
    - Fixed double "Becomes Initialized" triggers.
    - Initialization changes to facilitate "uncooperative" stats.
- Version 1.1.51
    - "Becomes Initialized" trigger was not waiting until all stat settings were updated.
- Version 1.2.0
    - Added Initialize extended API function call to allow user to invoke initialization via scripting.
    - Plug-in now properly recognizes temperature changes made via "Device control from menu", "Send X10 from ext interface", and "Send command from control panel".
    - Changed minor build for new release version.
- Version 1.2.1
    - Fixed GetHouseCode extended API script command.
    - Fixed Fahrenheit/Celsius change.
    - Temperature/Setpoint reports from thermostat are now handled better.
    - Setback Delta value of 0 is no longer supported. A zero Setback Delta is not supported by RCS but was used by plug-in as a redundant method of turning Setback Mode off.
- Version 1.2.2
    - Changes to Current Setpoint (e.g.,at WDU) cause Setback Mode to be disabled if Setback Mode had been enabled.
    - There is now a simple and an advanced debugging mode. The advance mode includes debug entries for message queuing.
- Version 1.2.3
    - Fixed "isbusy" javascript web bug.
- Version 1.2.4

    - Fixed FilterReminder device not updating.
    - Added warning when user attempts to enable Safe Mode.
- Version 1.2.5
    - Fixed bug with using Celsius with Decode Table commands.
    - Added ability to use unit code commands as specified by current Decode Table instead of preset dims whenever possible.
- Version 1.2.7
    - Fixed command confirmation for setpoints.
    - Fixed inability to disable debug mode.
- Version 1.2.9
    - Fixed some JavaScript web page bugs
- Version 1.2.11
    - Fixed ConditionUI validation error
- Version 1.2.12
    - Fixed inability to change Debug Mode Level
    - Fixed Setback Delta issues for Celsius. Note that this bug cause UNKNOWN MESSAGE (StatusItem=7; Status=#) errors
    - Fixed some temperature unit change bugs
- Version 1.2.13
    - Fixed fractional temperatures values that prevent some command confirmations
- Version 1.2.14
    - Another attempt to fix fractional temperatures values that prevent some command confirmations
- Version 1.2.16
    - Event triggers modified to be more intuitive. Should not affect existing triggers. Multiple triggers are now shown as being OR'd (only one trigger is checked at any given time).
    - Improved AUTO mode operational strategy with regards to dual setpoints. Note that this and any strategy involving this mode is subject to possible problems given that the RCS X10 stats do not report actual mode so plug-in must make assumptions about actual mode.
    - Plug-In now uses an XML configuration file rather than an INI.
    - Plug-In opens new default browser window rather than using a Windows Browser Control window.
- Version 1.2.18
    - Fixed bug where duplicate set of plug-in devices were being created
    - Improved temperature unit selection - no longer need to restart
    - Add a few more item to Options page
- Version 1.2.19
    - Fixed bug where if initialization failed for one stat, others would not operate properly.

- Version 1.2.21
  - Fixed bug where polling would not complete.
  - Removed debugging code from 1.2.20 that would not init stats.
- Version 1.2.23
  - Added more error protection for API scripting commands.
  - Added filter for received X10 commands to prevent repeated temperature-related commands from being misinterpreted.
  - Fixed web JavaScript bug related to "debug.value".
- Version 1.2.25
  - Fixed filter reminder dates not updating.
  - Polling sequence reordered to improve reliability of retrieving temperature settings.
  - Thermostat temperature and setpoint changes reported by the thermostat (via AUTOSEND) are now better handled while other temperature-related commands are waiting confirmation.
  - Polling sequence reordered to improve reliability of retrieving temperature settings.
- Version 1.2.26
  - Reordered sequence of event action processing so that complicated events function properly.
- Version 1.2.28
  - Fixed problem with incorrect thermostat Location fields when configuring more than one thermostat.
- Version 1.2.29
  - Fixed bug with plug-in ignoring the "No Logging" setting.
  - A few tweaks to polling sequence for users that still poll their stat.
- Version 1.2.30
  - "No Logging" bug was not just a problem with the setting but with the omission of the log entries for thermostat setting changes. The plug-in now logs thermostat settings as it did in earlier 1.2.X builds and users can use the "No Logging" setting to suppress logging.
  - Added *Getting Started* section to readme document.
  - Fixed bug with inability to turn Echo Off when Ack is still enabled.
  - Implemented new methodology for handling Setpoint when Setback Mode is changed.
- Version 1.2.33
  - Fixed some interactions bugs with ACK MESSAGE Mode and ECHO COMMAND Mode. Some users reported problems when one mode was enabled while the other was not enabled. Still may be issues with some firmware versions of the RCS X10 stats.
- Version 1.2.35
  - Fixed some web interface problems.

    - Some changes to support HomeSeer 2.0.
- Version 2.0.1
    - Changes to support HomeSeer 2.0.
    - Fixed formatting of event action descriptions.
- Version 2.0.2
    - Monitor Mode is no longer supported.
- Version 2.0.3
    - Some improvements for users running without any of the special modes (ACK, ECHO, SAFE, or AUTOSEND) enabled. However, ECHO and AUTOSEND are recommended to always be enabled for best performance.
- Version 2.0.4
    - Fixed problem with web page refresh.
- Version 2.0.5
    - For event actions, Hold Mode is processed first when it is being set OFF and it is processed last when being set ON. This will ensure that remaining actions for a given events are performed.
    - Fixed problem with Properties and Log Windows being stuck open. Improved appearance of windows.
    - Fixed Settings Mode showing -32768 instead of N/A (not available).
- Version 2.0.6
    - Added *PluginActive* property that will allow plug-in to be enabled/disabled
    - Fixed WebRefreshInterval problem
- Version 2.0.7
    - *PluginActive* property setting is now retained between restarts.
    - *PluginActive* property can now be accessed via plug-in device.
- Version 2.0.8
    - Fixed inability to change polling interval.
- Version 2.0.9
    - Fixed incorrect Decode Table property.
- Version 2.0.10
    - Altered initialization process to improve initialization success for systems with multiple thermostats.
- Version 2.0.11
    - Minor change to plug-in device creation procedure.
- Version 2.0.12
    - API changes to support MCE plug-in.
- Version 2.0.13
    - Initialization and polling sequence changed in an attempt to improve performance.
- Version 2.0.14

    - Attempted to prevent some UNKNOWN MESSAGE log entries.
- Version 2.0.15
    - Fixed "File Not Found" error that occurred with new installs.
- Version 2.0.25
    - Communication improvements to increase reliability.
- Version 2.0.26
    - More attempts to increase communication reliability.
- Version 2.0.29
    - Changes to prevent possible issues related to timer processing.
- Version 2.0.35
    - Added support for outside temperature for TXB16 stats. For now, user will need to create virtual device and a recurring event that updates the virtual device using &hs.GetPlugins("RCS X10 Thermostat").GetOutsideTemp(hs.GetPlugins("RCS X10 Thermostat").GetIndexByHouseCode("J")) where "J" is the house code of the TXB16 thermostat.
- Version 2.0.38
    - Added a plug-in device that lists status of all thermostats.
    - Timing of commands was adjusted on repeat attempts in an attempt to increase reliability.
- Version 2.0.40
    - Minor code changes.
- Version 2.0.41
    - Fixed command confirmation error
- Version 2.0.42
    - Yet another attempt to correctly handle a one type of temperature change report from the stat (AUTOSEND enabled) when the plug-in is waiting for another temperature related change to be confirmed.
    - Fixed initialization not recognizing Fan Mode confirmation
    - Fixed problem with right-click context menu on Thermostat Web Interface.
- Version 2.0.43
    - Fixed GetDevice warning in HomeSeer log.
    - X10 command queue is no longer populated when plug-in is deactivated.
    - When plug-in options are changed, log entries are only written if the options has changed.
- Version 2.0.44
    - Changes to prevent possible problems related to HS2's multithreaded capability.
- Version 2.0.45
    - Fixed object errors resulting from Version 2.0.44 changes.
    - To account for later TXB16 thermostat firmware revisions that do not support SAFE

COMMAND Mode, SAFE COMMAND Mode is assumed Off on third attempt to set it.

- Version 2.0.47
  - Temperature reporting changes.
- Version 2.0.48
  - Fixed a potential bug for HS 1.7 users.
- Version 2.0.55
  - Fixed some temperature type identification issues.
- Version 2.0.56
  - Fixed problem with activating/deactivating plug-in.
- Version 2.0.58
  - Brought back a feature in earlier versions where thermostat properties changes were written to the HomeSeer log. This feature can be enabled/disabled via the plug-ins Options. Also added a *LoggingEnabled* property to Extended API for scripting use.
- Version 2.0.59
  - Fixed plug-in device strings that were showing UNKNOWN.
  - Added independent retrieval of heat and cool setpoints during initialization and polling for later firmware versions of TXB16. If you have a TXB16 that supports this, you will need to enable this in the thermostat properties.
  - Also added option for TXB16 stats to change thermostat mode to force appropriate heat/cool setpoints which is necessary if stat is in AUTO mode. Note that this will potentially cause HVAC unit to temporarily turn on using an undesired mode.
- Version 2.0.60
  - Fixed Web Thermostat Control Interface.
  - Setup button on Interfaces Tab of HS2 Options Page now brings up config page.
- Version 2.0.61
  - Fixed plug-in status and thermostat status device strings.
  - Fixed problem with reactivating plug-in once inactivated.
- Version 2.0.62
  - Fixed web errors occurring when changing options.
  - Removed web page processor functionality to ensure proper functioning of HS web links.
  - HS2 broke Settings Mode functionality so a temporary fix requires that the event contain the name of the thermostat or contain the words "all thermostats", in order for it to be considered a settings mode. Before, the event could have any name but needed to have a least one thermostat action.
- Version 2.0.63
  - Fixed problem with polling timer.
  - Fixed updating of Windows interface menus when a stat is added/removed. Had to remove menu divider lines.

    - Fixed problem with new dual setpoint strategy for TXB16 stats being disabled on the web thermostat properties page.
    - For users who enable *Change Thermostat Mode For Setpoints* option for TXB16 thermostats, the thermostat mode is temporarily changed during initialization to ensure retrieval of correct dual setpoints in case they were changed while HS was not running.
    - Fixed error with recent Settings Mode change. The new change required users to rename their events to contain the name of an existing thermostat or the words "all thermostats". If the changes were not made, an error was being generated when CmdSetSettingsMode was being called.
    - Fixed problem with new dual setpoint strategy for TXB16 stats being disabled on the web thermostat properties page.
    - Fixed problem with polling timer.
    - New thermostats will be give the location "RCS X10 Thermostat" and name "Thermostat J" (where J is the thermostat's housecode) if user does not specify location or name.
- Version 2.0.64
    - To avoid problems with HS2 event handling, *Settings Mode* is no longer available. The *Settings Mode* plug-in device has been replaced with the *Message Modes* plug-in device that shows current settings for *ACK MESSAGE Mode*, *ECHO COMMAND Mode*, *SAFE COMMAND Mode*, and *AUTOSEND Mode*.
- Version 2.0.65
    - Fixed HS2 console menus when plug-in is disabled and re-enabled while HS2 remains running.
    - When running with HS2, plug-in web links now use HS2 link buttons.
- Version 2.0.66
    - Improvements to command processing to ensure good operation with HS 1.7. and HS 2.0.
- Version 2.0.67
    - Fixed fan indicator on Web Thermostat Control Interface page.
    - Fixed Options page showing two "submit" buttons thereby causing form to not submit.
- Version 2.0.69
    - Returned to command processing scheme used in 2.0.66.
    - Fixed *Message Modes* plug-in device that was not updating to show current status of all message modes.
- Version 2.0.70
    - Fixed X10 events not being processed after initialization.
    - Changes to prevent data loss when user system has corrupted Microsoft VBScript 5.6+ install.

- Version 2.0.74
  - Improved dual setpoint handling for both TXB16 and TX15-B stats running under HS 1.7 and HS 2.0.
  - Polling interval is now independently configurable for each thermostat and no longer a global setting.
  - *Message Modes* (ACK, ECHO, SAFE, and AUTOSEND) are no longer shown in right click context menu and have been moved to thermostat properties dialog/page.
  - X10 preset dim commands for *Message Modes* are now only sent when command setting has been changed or if plug-in is making the third and final attempt to initialize a thermostat.
- Version 2.0.75
  - Added event triggers for command confirmation failure, initialization failure and poll failure. Note that initialization and poll failures do not apply to when user aborts that operation.
  - Added event conditions for "Is Polling", "Is Not Polling", "Initialization Aborted", and "Polling Aborted".
  - Added context menu option to immediately poll stat.
  - Changes to allow partial operation with ACK MESSAGE Mode *and* ECHO COMMAND Mode disabled.
  - Improved handling of non-bidirectional X10 thermostats (TX15).
  - Fixed polling looping.
  - Fixed polling not starting after a failed initialization.
  - Fixed problem with an expired filter reminder not allowing Filter Reminder device to be updated.
  - Fixed CheckTrigger error.
  - Individual thermostat logging is no longer supported.
- Version 2.0.76
  - Fixed polling looping.
- Version 2.0.77
  - Except for a user request for immediate polling, the plug-in will now only allow one stat at a time to be polled. Initialization will still be concurrent for multiple stats unless one stat has made two failed attempts. After two failed attempts, only one stat will be initialized at a time.
  - Fixed inability to disable polling.
  - Fixed inability to save "Enable hardware dual setpoint control" setting in Windows interface.
- Version 2.0.78
  - Attempted to fix problem recognizing X10 received command when running plug-in with HS 1.7.

    - Fixed problems associated with thermostat changes via HomeSeer Status page.
    - Fixed incorrect reporting of ACK and ECHO being OFF.
- Version 2.0.79
    - Initialization and polling have been returned to consecutive operation as in earlier builds.
    - Fixed some issues associated with the dual setpoint enhancements.
- Version 2.0.80
    - Fixed problem with disabling timed polling but yet still allowing user to force a poll.
    - More fixes for hardware dual setpoint control.
- Version 2.0.81
    - Another tweak to improve temperature type recognition.
- Version 2.0.82
    - Plug-In should now work with HS 1.7 again.
    - Ability to manually poll when polling interval is 0 was fixed.
    - Using the reset button to reset filter reminder within Thermostat Properties will now immediately reflect a change, if any, to the filter days field.
- Version 2.0.83
    - Fixed problems with setpoint events.
- Version 2.0.85
    - Fixed problems with using the feature that changes thermostat modes to set hardware dual setpoints (TXB16 only).
    - Fixed problems with Message Mode settings (ACK, ECHO, SAFE, and AUTOSEND) not remaining persistent.
    - Attempted to fix some Setback Mode related issues.
- Version 2.0.86
    - Fixed problem with polling interval setting not being retained.
- Version 2.0.87
    - Plug-In now polls a setting that was not properly confirmed.
- Version 2.0.89
    - Fixed more problems with Setback Delta misinterpretations.
    - Fixed most HS 1.7 looping issues.
    - Added ability to exclude Setback Mode/Delta from initialization and polling for users who do not use Setbacks.
- Version 2.0.90
    - Plug-in now employs immediate temperature and setpoint polls when temperature type cannot be determine from a received temperature value.
    - Fixed problems with repeated error messages for invalid settings. Should only see message once.
    - When operating with debug mode enabled, references to "Ignore I/O queue" are now

termed "Recent I/O queue" to better reflect what is happening with the event queues.

- Version 2.0.91
  - Fixed inability to recognize a returned "Setpoint" value as "Heat Setpoint" when thermostat is in HEAT mode (and vice-versa for COOL mode).
  - Fixed TriggerUI format bug when upgrading from older builds.
  - In an attempt to correct lingering command looping with HS 1.7, recent I/O queue timing as adjusted and a value added to Settings.xml (RecentEventTimerInterval) for manually tweaking of this parameter.
- Version 2.0.94
  - Fixed PluginActive status looping with HS 1.7.
- Version 2.0.95
  - Fixed setting of dual setpoints while in AUTO mode.
- Version 2.0.96
  - Added "Unknown Temperature Type" received event trigger.
  - More work on *Change Thermostat Mode for Dual Setpoints* option.
  - Reduced total initialization time.
- Version 2.0.97
  - Fixed Recent Event queue not emptying.
  - Fixed setpoint/temperatures not adhering to user/hardware limits.
- Version 2.0.98
  - Filter Reminder can now be disabled by setting Filter Days to 0. Note that device will still be displayed within HomeSeer.
  - Fixed issues with setting dual setpoints via events.
- Version 2.0.99
  - Heat Pump Recovery Mode improved. Now only works with heating mode as it should have been.
  - Disabling the plug-in, now stops RCS X10 Thermostat even conditions, triggers, and actions from working.
  - Fixed a problem where failed commands would not be removed from the event queue and would continue to repeat.
- Version 2.0.100
  - Fixed initialization problem related to *Change Thermostat Mode for Dual Setpoints* option.
- Version 2.0.101
  - *Include Setback Mode/Delta When Polling* options is now an individual thermostat property instead of a global setting.
  - Fixed initialization problem when excluding Setback Mode/Delta
  - Fixed problem with changing *Heat Pump Recovery Mode* setting via Web Thermostat Properties.

- Version 2.0.103
  - Changes to facilitate process of adding a new thermostat to the plug-in.
  - Changes to tackle automation errors reported when accessing Thermostat Control Interface.
  - Fixed problem with thermostat mode being changed when setpoint change while thermostat mode is OFF.
  - Added GetPollingInterval to scripting interface.
- Version 2.0.104
  - Fixed problem with adding/removing thermostats that resulted from changes in 2.0.103.
- Version 2.0.105
  - Initialization and Polling will now stop after three failed attempts.