

# NC Systems, Inc.

## Release Notes

### Extension Driver – Hubitat – Lights API – Lights – IP version 1.0101.04

## Extension Driver

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This release note is for the HUBITAT:Lights Crestron Home Extension Driver.

The HUBITAT:Lights driver is one of a series of drivers that integrate Z-Wave, Zigbee, and Wi-Fi smart devices with Crestron Home. The Hubitat Elevation C-7 home automation hub is utilized as a REST API based gateway for the Crestron Home processor, enabling wireless communications with Z-Wave, Zigbee, and Wi-Fi devices.

The HUBITAT:Lights driver is intended to be used as an adjunct to Crestron and Lutron lighting systems, providing a user interface similar to the native Crestron Home interface for supplemental, specialty, gap-filler lights and other switch controlled devices.

This driver allows a Crestron controlled lighting load to be added to a standard outlet inside or outside the residence. It also allows standard wall-mounted switches and dimmers to be converted or replaced with Z-Wave, Zigbee, and/or Wi-Fi devices. Examples include plug-in dimmers for outdoor string lights, landscape lighting, holiday lights, etc., outdoor plug-in switches for fountain pumps, fans, etc., indoor plug-in dimmers for accent lighting, indoor wall dimmers, and small modules that mount inside an electrical box (that convert a conventional switch to a smart switch) for utility rooms, garages, etc. This driver also provides Programmable Operations in the Actions section of the Actions & Events page of the Crestron Home Setup App, permitting the selection of preset levels that allow the inclusion of devices controlled by the HUBITAT:Lights driver in lighting scenes and schedules.

This driver operates in a demonstration mode for up to two hours without entering a license key. Rebooting the Crestron Home processor or changing any item on the Installer Settings page restarts the two-hour demo mode. A full license can be purchased at <https://NCSystemsInc.com>.

In this document the following shorthand references are used: The HUBITAT:Lights Extension Driver will be referred to as “the driver”, the Crestron Home Setup application will be referred to as “the Setup App”, the Crestron Home End-User application will be referred to as “the End-User App”, and the web browser-based Hubitat Elevation application will be referred to as “the Hubitat App”.

## Notes and Recommendations

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The driver requires a Hubitat Elevation C-7 automation hub to operate. This driver can support up to 16 lighting devices per instance. Although the driver could support a larger number of devices, a limit of 16 was selected to limit the amount of scrolling needed to view all devices on a page in the End-User App. There is no fixed limit to the number of instances of the driver that can be installed on a Crestron Home processor.

## System Requirements and Dependencies

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The following are required to run the driver:

- Crestron Home v3.017.0100 or later
- CP4-R or MC4-R Crestron Home processors
- Hubitat Elevation C-7 automation hub v2.3.4.134 or later

## Installation/Upgrade Instructions

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Installation of the HUBITAT:Lights driver involves the following steps:

- Using the Hubitat App, install a Hubitat Elevation C-7 automation hub
- Acquire Z-Wave (by Inclusion) and Zigbee (by Pairing) devices
- Confirm proper operation of the acquired devices
- Create a Maker API App and select the devices to be added to the App
- Note and save the App ID and Access Token for the Maker API
- Using the Setup App, add the HUBITAT:Lights driver (Drivers->Lights->Hubitat->Lights API)
- Give a descriptive name to the driver and enter the TCP/IP settings
- Fill in the Installation Settings information
- Using the End-User App, complete the device setup and select preset levels
- Using the Setup App, include lighting sequences/actions in the Actions & Events section as needed

Two videos in the Tutorials section of the [habitat.com](http://habitat.com) website titled “How to Set Up and Register Your Hub” and “How to Add Devices” provide a helpful overview of these procedures.

### Hubitat Installation Steps

The primary method by which the HUBITAT:Lights driver communicates with Z-Wave, Zigbee, and Wi-Fi devices is via the Hubitat Maker API app. The Maker API app aggregates multiple diverse lighting and switch devices into a single uniform and consistent interface. While it is the responsibility of the installer to create and modify Maker API's, the process is neither difficult nor time consuming.

An article in Residential Tech Today magazine written by Jay Basen gives an excellent overview of the Hubitat system and how it can be used to integrate a large variety of Z-Wave, Zigbee and IoT devices with Crestron systems. The article can be viewed at: <https://restechtoday.com/integrating-a-wide-range-of-zigbee-z-wave-and-iot-devices-with-crestron/>.

Mr. Basen offers a Crestron user module that interfaces Hubitat systems with Crestron Series 3 and 4 SIMPL Windows systems. The information in the section entitled “Installation of a Hubitat Elevation Hub” provides relevant instructions for setting up a Hubitat system for use with the HUBITAT:Lights driver.

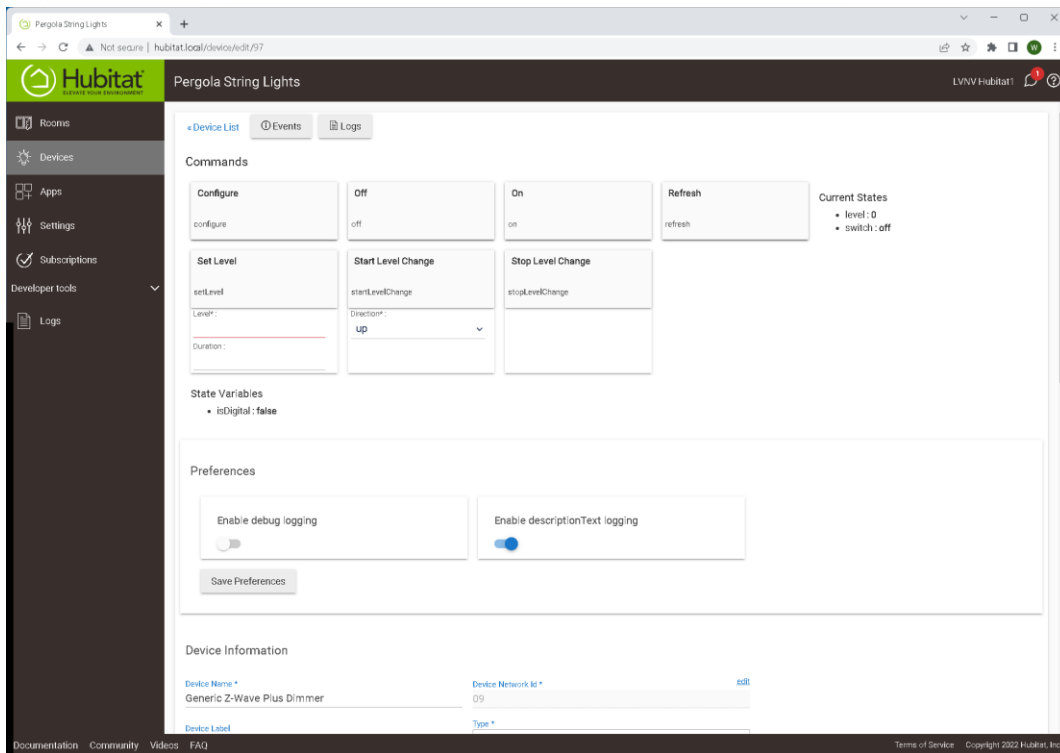
Steps 1 through 6 cover the installation of the Hubitat hub and the acquiring of devices.

Once the devices have been acquired, the Hubitat App Devices page can be used to select and configure each device. In the Commands section of the Device control page shown below, each device can be operated directly from the Hubitat App.

Z-Wave, Zigbee, and Wi-Fi switches and many plug-in dimmers have only two Preference settings that allow debug and description text logging. Enable description Text logging to see device operation in the Hubitat Logs. In-wall dimmers will tend to have many more Preferences settings than switches or plug-in dimmers. Key Preferences to look for and to set are:

- Level Reporting Interval – 1s or shortest available.
- Minimum Brightness – usually 1%.
- Maximum Brightness – usually 99%.
- Enable debug logging – off.
- Enable description Text logging – on. This causes device commands and responses to be logged.

Be sure to click the “Save Preferences” button after making changes to the settings in the Preferences section.

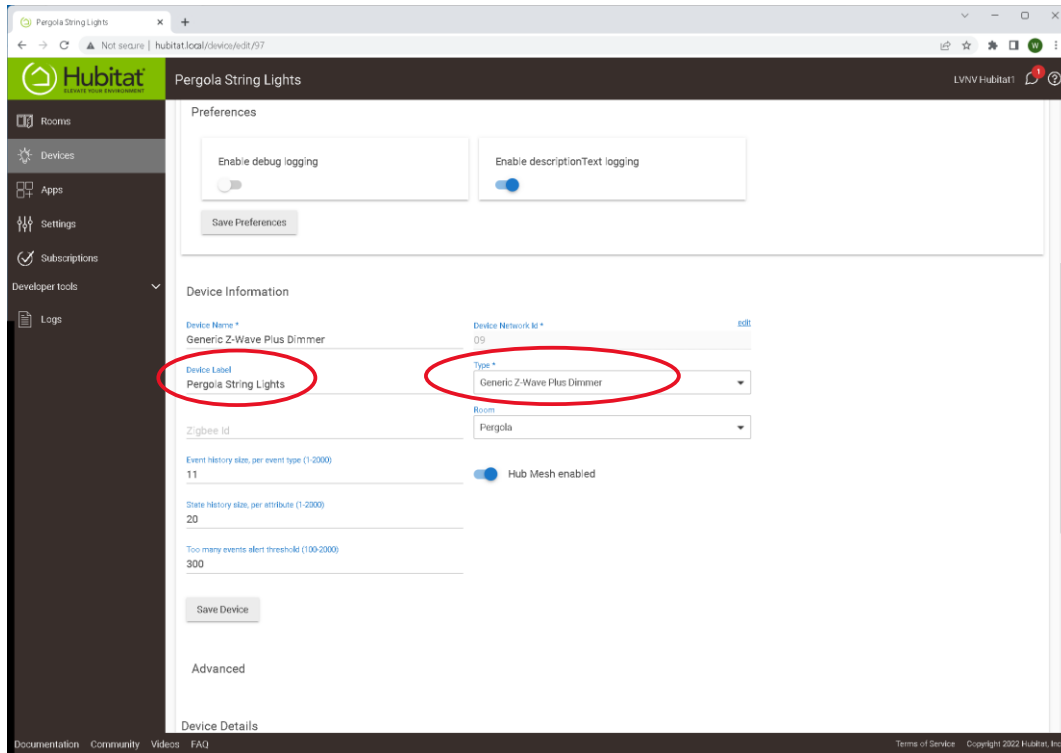


Further down on the same page, in the Device Information section, the Device Label field contains a name that will be used as the label for the Toggle Slider or Toggle controls in the End-User App. The Device Label can be changed if desired.

On the same page also verify that the Type field selection contains the word “Dimmer” or “Switch”. If the name in that field does not contain “Dimmer” or “Switch”, use the drop-down list to select an appropriate Z-Wave or Zigbee device Type. If the Type field does not contain “Dimmer” or “Switch” the HUBITAT:Lights driver will not be able to operate the device. Unless the Type field does not contain “Dimmer” or “Switch”, it

is recommended that the default Device Type selected by the Hubitat hub be utilized. See the discussion on selecting Dimmer Types in the Limitations/Known Issues section.

It is important that the Hub Mesh enabled parameter be set to On. Be sure to click the “Save Device” button after making changes to the fields in the Device Information section.

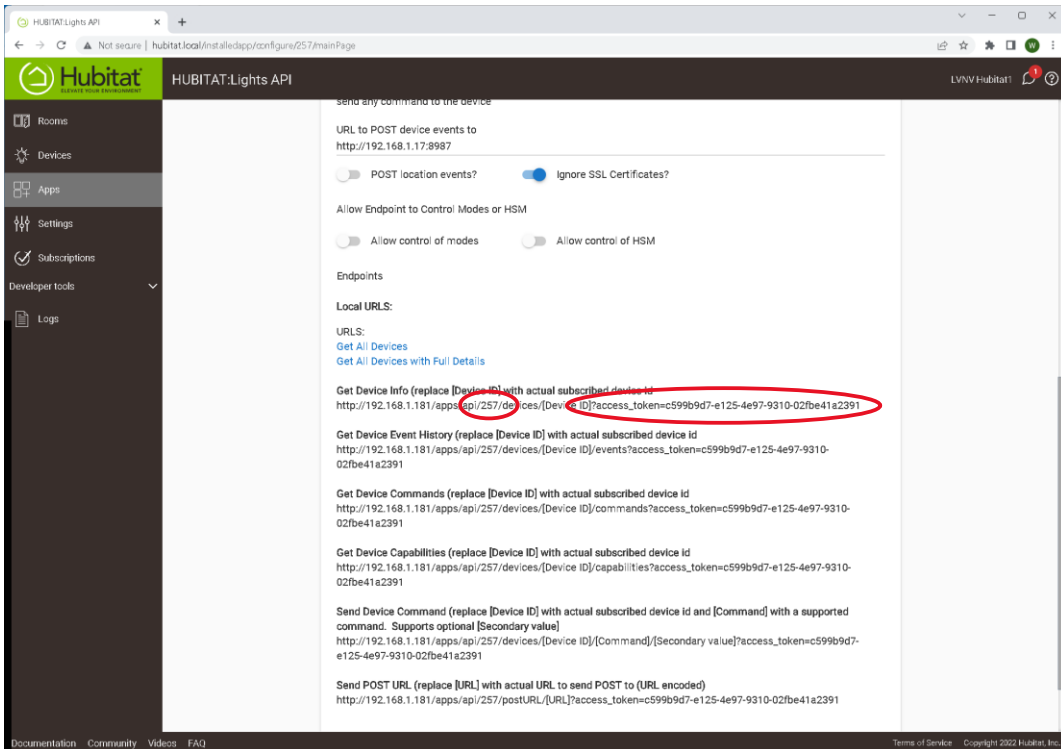
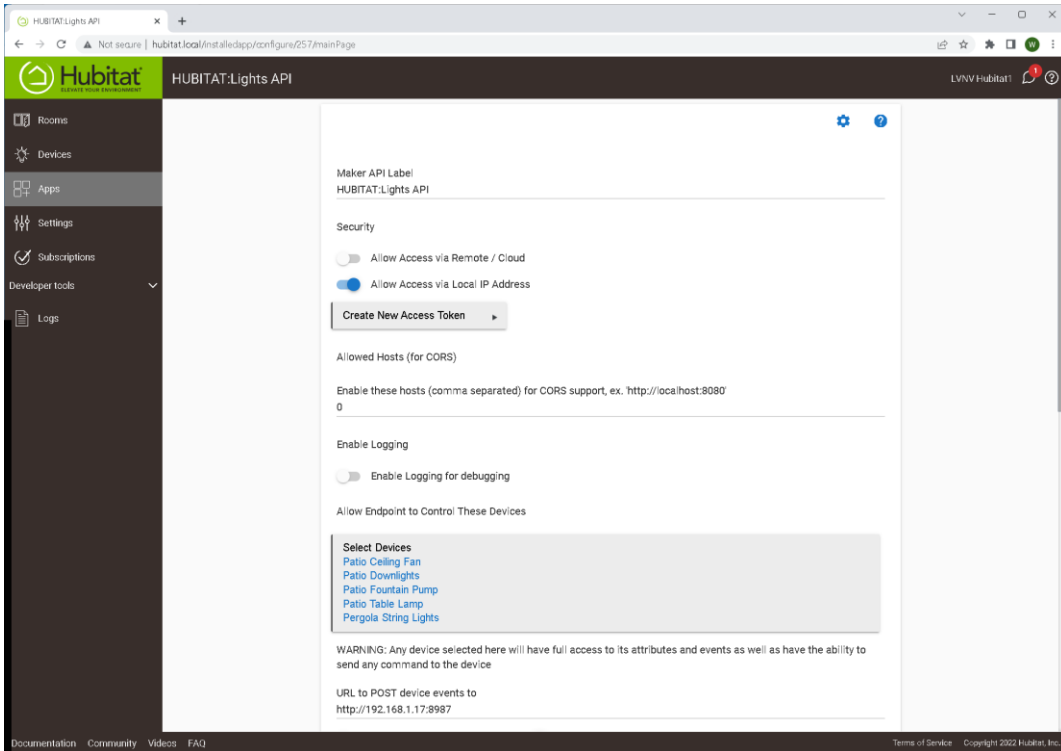


To add a Wi-Fi device, go to the Devices page of the Hubitat App and click the the “Add Device” button. Typically, only Wi-Fi devices having a Protocol listed as LAN from the Hubitat List of Compatible Devices (<https://docs2.hubitat.com/en/devices/list-of-compatible-devices>) should be used to ensure that a supported Hubitat device driver will be used.

Start the installation by clicking on the “Find by brand” button, locate the device type under its brand name, and click on the device type button. Then locate the Device name in the list of devices and click on the “Add” button. After that, follow the instructions to install the device. Use the device’s app to add the device to the Wi-Fi network. After adding the device to the network, go to the Devices page for the new device, enter its IP address, and verify its operation by clicking on the various command buttons.

Some devices are parent devices that do not have device controls (e.g., On or Off) on the Device page. In those cases, go back to the Devices list, locate the parent device, note the list of child devices under it, and select a child device for control checkout on the Devices page.

Steps 7 through 10, and step 12 (skip step 11) describe how to create a Maker API App. Although Hubitat supports a large number of Built-In Apps, only the Maker API works with the HUBITAT:Lights driver and should be the only type of Built-In App utilized for this driver. The Maker API page shown below lists the devices that have been added to the Maker API, and also permits the addition and deletion of devices.



Further down on the same page, in the Local URLs section, the Maker API App ID and Access Token values are found. These values must be entered in the Installer Settings page of the Crestron Home Setup App when a

new instance of the driver is installed. The small red oval above highlights where the Maker API App ID can be found and the elongated red oval highlights where the Access Token can be found.

Each instance of the Driver used requires its own uniquely named Maker API, with its own set of devices, Maker API ID, and Access Token.

### HUBITAT:Lights Driver Installation

In the Crestron Home Setup App, select Pair Devices, select a Room, and under Device Types, select Drivers. When Updating Drivers completes and a list of driver types is presented, scroll down to Lights and select it. When a list of Lights manufacturers is shown select Hubitat. The Lights API driver will be displayed. Click on the plus sign and the driver will be loaded from the Crestron Drivers Portal.

The first page that appears after a HUBITAT:Lights driver has been loaded, and paired to a Room, requires the entry of a descriptive name for the driver and IP Address and Port information. The descriptive name entered will be shown on the End-User Interface Room Tile and on the Setup App Actions & Event page under the Settings heading. The IP Address is for the Hubitat Elevation hub that is running the Maker API App intended for the driver. The Port number must be unique for each instance of any HUBITAT:Driver added to the system. Leave the Requires Authentication checkbox unchecked.

Enter a descriptive name for Lights API

Outdoor Lights

Please enter TCP/IP settings:

TCP/IP settings	Value
IP Address	192.168.1.181
IP Port	8910

Requires Authentication:

OK Cancel

Once this form is complete and the OK button is clicked, the Installation Settings page will be shown.

## Outdoor Lights Settings

About	Control	Installer Settings	Advanced
<b>License Key</b> Please go to <a href="https://NCSystemsInc.com">https://NCSystemsInc.com</a> to obtain the necessary license key. The driver will operate without a license key for 2 hours.	<input type="text" value="91776B7F-37BE-134A-F03C-50A4E9E72"/>		
<b>Lights Control Title</b> Enter the title of the Lights Control page	<input type="text" value="Lights"/>		
<b>Hubitat Maker App ID</b> Enter the Hubitat Maker App ID	<input type="text" value="257"/>		
<b>Hubitat Access Token</b> Enter the Hubitat Access Token	<input type="text" value="c599b9d7-e125-4e97-9310-02f8e41a23"/>		
<b>Visible in Home Page</b> Show a Tile in the Home Page	<input checked="" type="checkbox"/>		
<b>Visible in Room Page</b> Show a Tile in the Room Page	<input checked="" type="checkbox"/>		
<b>Settings Button Visible</b> Show the Settings Button	<input checked="" type="checkbox"/>		
<input type="button" value="OK"/> <input type="button" value="Cancel"/>			

**License Key** – A paid license key is required to activate this extension driver. The key can be obtained at <https://NCSystemsInc.com>. This driver will function for two hours in Demo Mode without a license key.

**Lights Control Title** – A descriptive title that appears at the top of page containing the lighting controls.

**Hubitat Maker App ID** – Enter the ID of the Maker API App that was created for this instance of the driver.

**Hubitat Access Token** – Enter the Access Token of the Maker API App that was created for this instance of the driver.

**Visible in Home Page** – Check to cause a tile to be shown on the Home Page.

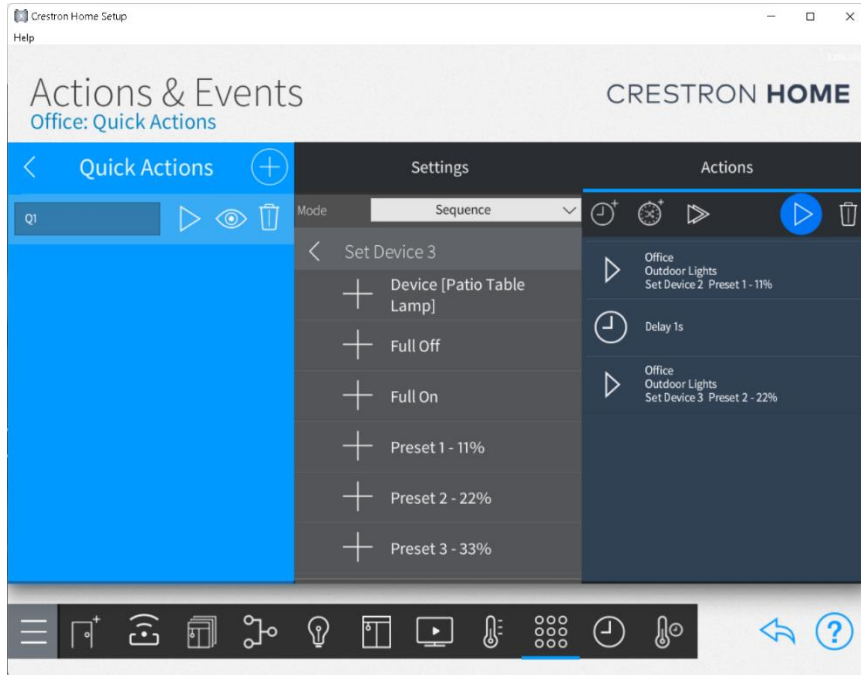
**Visible in Room Page** – Check to cause a tile to be shown on the Room Page.

**Settings Button Visible** – Check to show the Settings button on the Lighting Controls page. Uncheck to hide the Settings button.

Selecting the OK button will complete the installation of the driver and make it available for use.

## HUBITAT:Lights Actions

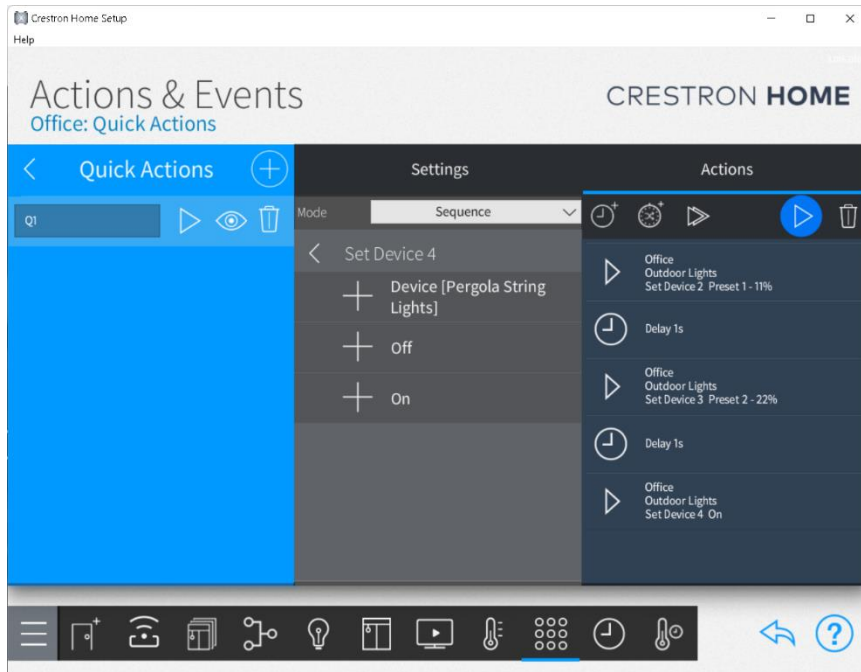
The HUBITAT:Lights driver makes On/Off/Preset lighting control for devices available on the Setup App Actions & Events page to be used in any sequence triggered by any Event. Depending on whether the lighting device is a dimmer, a dimmer with a non-dim load, or a switch, the following two types of Actions pages will be presented. Note that the first setting shown is the name of the device being controlled and if selected will not perform any operation.



### Dimmer Devices

The available controls for dimmer devices are Full On, Full Off, and up to five preset levels.

The preset levels are defined on the Settings page of the driver in the End-User App. The driver Settings page allows the definition of up to five Preset levels. When the Preset values are changed in the End-User App, they will appear on this page the next time a device is selected.



### Switch Devices

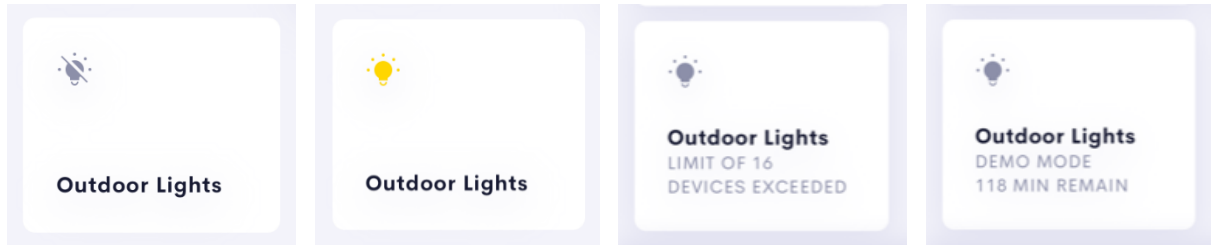
The available controls for switch devices and dimmers devices controlling a non-dim load are On and Off.

The first setting for both Dimmers and Switches is the name of the device. If the device name is selected as an action, no operation is performed when the sequence is executed.



## End-User Experience

The Room Tile for this driver reflects either normal operation of a licensed driver or one of several possible demo mode or error conditions.

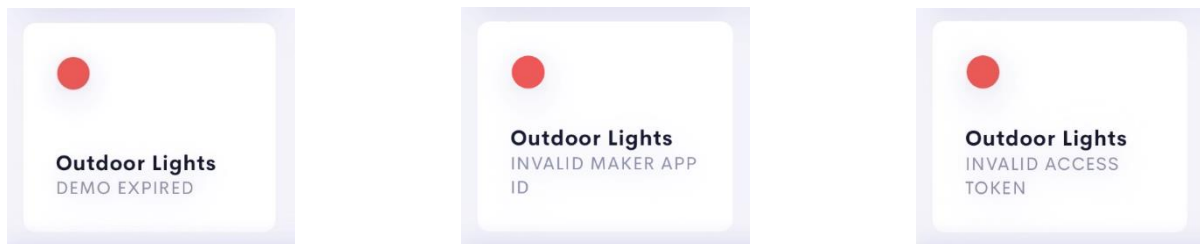


**Left:** Normal Operation – All Lights/Loads Off – When all lights/loads controlled by a given driver instance are off, a Lights Off icon will be shown on the Room Tile.

**Left Center:** Normal Operation – At Least One Light/Load On – When at least one light/load controlled by a given driver instance is on, a Lights On icon will be shown on the Room Tile

**Right Center:** Device Limit Exceeded – The number of devices found in the specific Hubitat Maker API App used by this instance of the driver has exceeded the maximum of 16. The driver will continue to operate with a truncated list of devices. The Hubitat Maker API App should be adjusted to a maximum of 16 devices.

**Right:** Demo Mode – Whenever the driver is added to the system without entering a license key, the driver will be started in Demo Mode. The Home Page and Room Tiles show a status of Demo Mode and time remaining in the Demo. A license key can be applied at any time during Demo Mode. Configuration and Preset Level information entered during the Demo Mode period(s) will remain after a valid license key is provided.



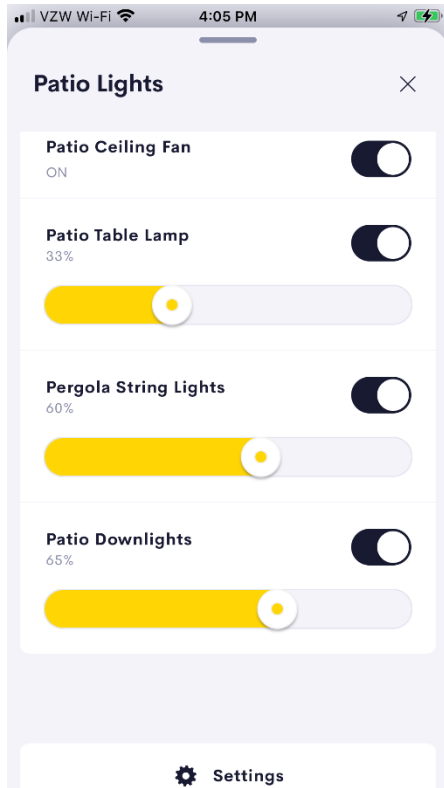
**Left:** Demo Mode Expired – When the Demo Mode expires, the Room Tile will show a red dot and a Demo Expired status. The driver will be disabled. When the Demo Mode expires, a reboot of the system or changing any item on the Installer Settings page will restart the 120-minute Demo Mode period. If an invalid license key is entered, a 120-minute Demo Mode period will be started.

**Center:** Invalid Maker App ID – The Hubitat will respond with an App Exception message if it cannot find the specified Maker API App ID. The driver will be disabled until the correct the Maker API App ID is entered.

**Right:** Invalid Access Token – The Hubitat will respond with an Invalid Token message if the specified Access Token does not match the Access Token associated with the Maker API App ID. The driver will be disabled until the correct the Access Token is entered.

## The End-User Interface

Pressing the Home Page or Room tile will cause the driver to navigate to the Lighting Controls page where controls for each device in the API for the driver are shown.



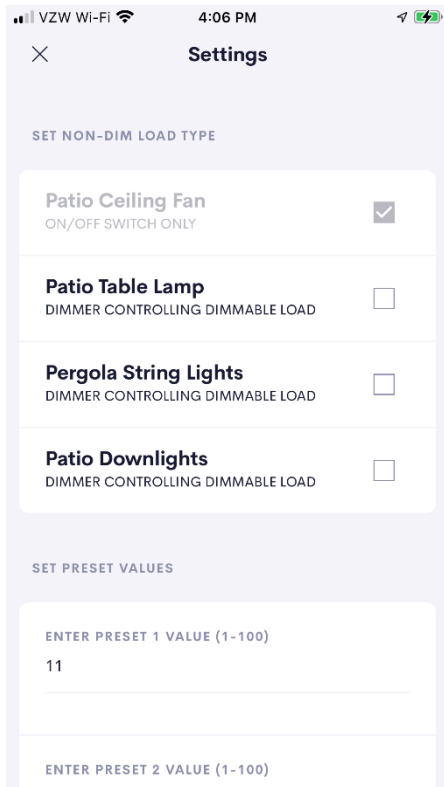
### Lighting Controls

The Lighting Controls page contains one control for each device included in the Hubitat Maker API App. Dimmer devices use a Toggle Slider control and switch devices use a Toggle control. The name of each device is the name given in the Device Information / Device Label field of the Hubitat App Device page.

The number of lighting controls shown on this page is variable and depends on the number of devices included in the Hubitat Maker API App.

If the number of devices included in the Maker API App is greater than 16, the number of devices used will be truncated to 16, the status text on the Home and Room tiles will be set to "LIMIT OF 16 DEVICES EXCEEDED", an error message will be entered in the system error log, and the driver will operate normally with 16 devices.

The next page shown is the Settings Page. A Settings Page is provided in the user interface of the End-User App, rather than having parameter entries on the Installer Settings page of the Setup App, to permit the system installer to rapidly configure, setup, modify and test settings of the driver. Settings changes made in the End-User App can be seen and incorporated on the Actions & Events page of the Setup App as soon as they are made. When a suitable configuration has been achieved, the installer can uncheck the Settings Button Visible attribute on the Installer Settings page of the Setup App to preserve setup information during normal use.

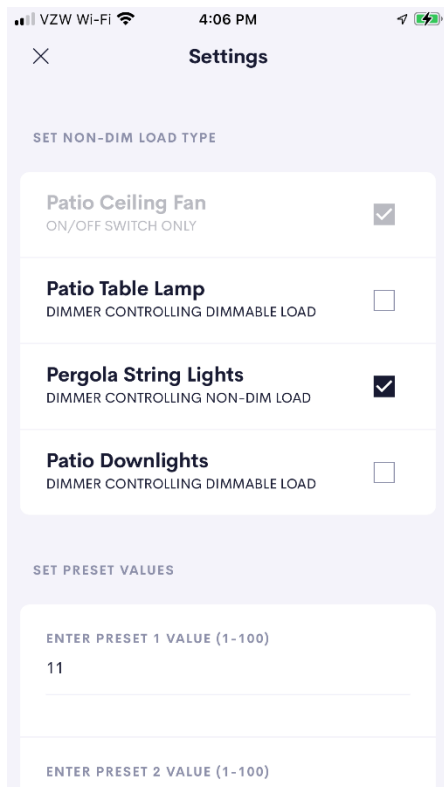


## Settings Page

The Settings Page provides Checkbox controls to allow dimmers to be treated as switches and Text Entry controls to allow entry of up to five preset values.

Check the entry for any dimmer that is either used to control a non-dimmable load or for which only on/off control is desired. When a dimmer is converted to non-dim use, the Toggle Slider control on the Lighting Controls page is immediately changed to a Toggle control.

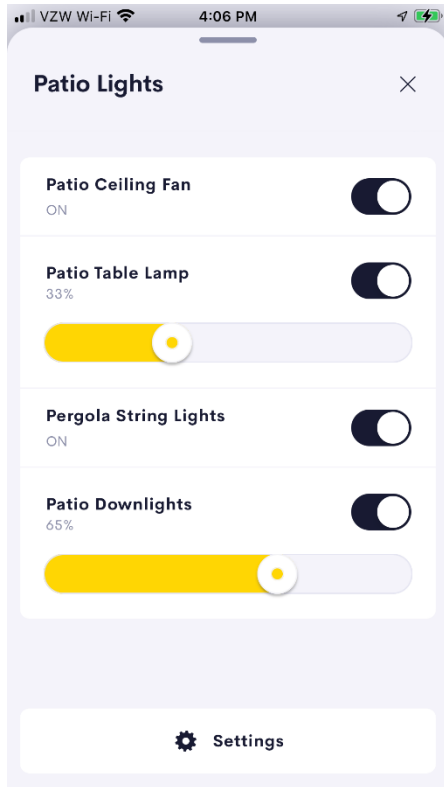
The preset values are available across all dimmable devices. These are typically used to match lighting levels when dimmers are included in lighting scenes of the main (Crestron/Lutron) lighting system. The preset values may be changed at any time and they will immediately be available on the Action & Events page of the Setup App. Any changed setting already selected as an action will not be updated to reflect the new preset value.



## Settings Page with new Non-Dim selection

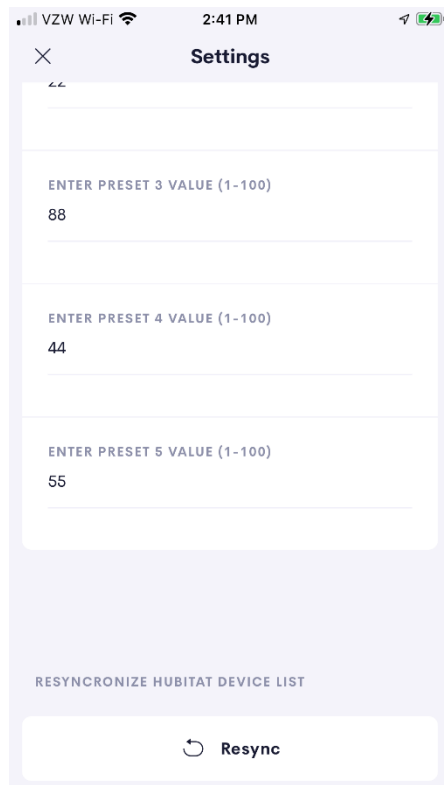
This screen shot shows the Pergola String Lights after being changed to a non-dim load type.

Also shown is the beginning of Text Entry controls for five presets.



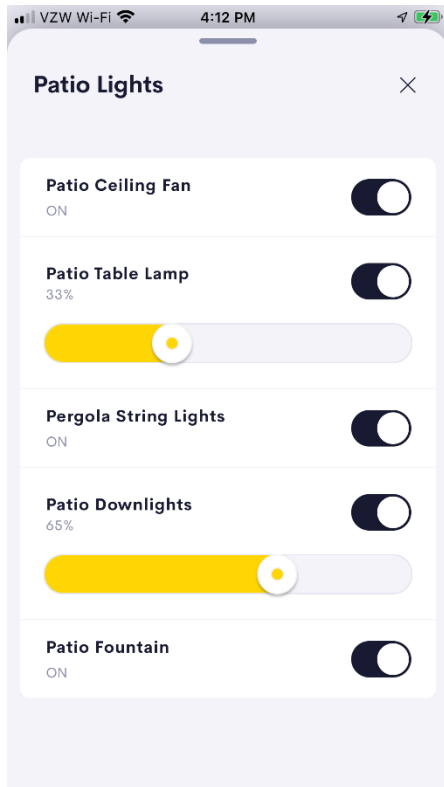
### Lighting Controls Page showing new Non-Dim Control

This screen shot shows the Pergola String Lights load with its new Toggle control.



### Settings Page Showing Resynchronize Button

The Resynchronize button appears at the bottom of Settings Page. It is used to apply changes made to the number, type, and names of devices in the Hubitat Maker API. Devices can be added to, or deleted from, the Maker API and device names can be changed in the Device Information / Device Label field of the Hubitat App Device page at any time. When the Resynchronize button is pressed, a new device list is obtained from the Hubitat and the entire Lighting Controls Page and Settings Page are immediately updated to reflect the changes made in the Hubitat App.



### Lighting Controls Page showing new Patio Fountain load added

The screen shot shows a new Patio Fountain control which was added to the Maker API in the Hubitat App and then brought into the Lighting Controls Page by pressing the Reinitialize button on the Settings Page.

## Limitations/Known Issues

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Three areas of Limitations/Known Issues are:

- Toggle and Slider gets out of sync in Toggle Slider control (Resolved)
- In-wall Dimmers tested had device status feedback issues
- Dimmer Type selection

### [Toggle and Slider Get Out of Sync in Toggle Slider Control](#)

This issue has been resolved with the release of the Crestron Home App for IOS v1.25.11.

Dimmers and lights are controlled via the controls on the End-User App, by Actions specified on the Actions & Events page of the Setup App, by operating an in-wall dimmer, and by Device control pages on the Hubitat browser. When setting the dimmer level by moving the End-User App Slider control or using presets without touching the Toggle button, the Slider and the Toggle can get out of sync. The Toggle or the Slider will not reflect the current on/off state of the load. This is a known problem with the Toggle Slider control used on IOS devices and Crestron TSW touchpanels, for which there is an outstanding bug report. The problem does not exist on Android devices.

### [In-Wall Dimmers Tested Had Device Status Feedback Issues](#)

Of the four in-wall dimmers tested, only the Leviton In-Wall Dimmer did not provide consistent status feedback. While it correctly executed on/off/level commands from the Actions Sequence on the Actions & Events page, the feedback was often wrong, with both the On/Off state and the dimmer level being incorrectly reported. With a "Date First Available" of more than 10 years earlier than the other three dimmers tested, outmoded firmware is suspected.

With the proper Device Type selected, Zooz, UltraPro, and Enbrighten in-wall dimmers always correctly executed commands from both the user interface Toggle/Slider controls and preset actions, and provided accurate status feedback.

The Enbrighten Zigbee Dual plug-in dimmer restricts low level settings. When a commanded to a level of 10% or less, it sets the load to full on. A minimum level of 11% had to be set in the Hubitat device preferences section to avoid this behavior.

When in-wall devices are operated by pressing their On and Off buttons (upper and lower halves of the rocker paddle), the results were varied:

UltraPro Z-Wave dimmer: Pressing the On button turned on the load to 77%. It was not possible to change that value. Pressing and holding the On and Off buttons raised and lowered the level. Pressing the Off button turned off the device. Status feedback on user interfaces always reflected the correct load level.

Enbrighten Zigbee dimmer: Pressing the On button turned on the load to 100%, the Toggle indicates On, but the Slider indicates 0%. Pressing and holding the Off button causes the dimmer to lower its level, and the Slider will then show the correct level. The level can then be raised and lowered by pressing and holding the On/Off buttons, and the Slider will reflect correct levels. Pressing the Off button turns off the device and the status feedback is correct. Investigation revealed that the source of the missing level problem when turned on is in the Zigbee device driver for the device.

Zooz Z-Wave dimmer: All button presses on the device always resulted in correct operation of the device and correct status feedback on user interface.

All Z-Wave, Zigbee, and Wi-Fi switches, and all dimmer devices placed in non-dim mode, executed commands correctly and provided correct status feedback when device buttons were pressed.

The LIFX Wi-Fi smart LED bulb did not operate correctly. While it's app operated the device flawlessly, the device would occasionally miss On or Off commands issued both from the Hubitat App Devices page and from the Driver controls page.

### [Dimmer Type Selection](#)

The Device Type on the Hubitat App Device page allows the user to select a Hubitat device driver that will work the best with the HUBITAT:Lights driver. The following Z-Wave Dimmer Device Types have been tested:

- Generic Z-Wave Dimmer
- Generic Z-Wave Plus Dimmer
- Generic Z-Wave Smart Dimmer
- GE Enbrighten Z-Wave Smart Dimmer
- GE Z-Wave Plus Dimmer
- Zooz Zen72 Dimmer

The following Zigbee Dimmer Device Types have been tested:

- Generic Zigbee Dimmer
- GE Zigbee Dimmer

The following Z-Wave Switch Device Types have been tested:

- Generic Z-Wave Plus Switch

The following Zigbee Switch Device Types have been tested:

- Generic Zigbee Switch
- GE Zigbee Switch

If initial device behavior is not acceptable, other Device Types can be tried. It is recommended that the Generic Z-Wave Dimmer/Switch or the Generic Zigbee Dimmer/Switch be used initially when trying out different Device Types.

## Supported Features

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The HUBITAT:Lights driver supports the following user features:

- Ability to set any load on/off
- Ability to set any dimmer lighting load 0 to 100%
- Ability to display current status of in-wall light switches and dimmers directly controlled by a user
- Ability to restrict any dimmer to non-dim operation
- Ability to specify up to 5 dimmer presets applied across all dimmers
- Availability of all On/Off/Preset commands for all devices on Actions & Events page of the Setup App

## Test Environment

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The HUBITAT:Lights driver has been tested with the following:

- Crestron Home v3.017.0098
- Crestron Home App for IOS v1.25.11
- Hubitat Elevation C-7 hub v2.3.4.117
- Minoston MP22ZD Z-Wave plug-in outdoor dimmer outlet
- NewOne N4002 Z-Wave plug-in dimmer smart outlet
- Minoston MP22ZP Z-Wave outdoor outlet
- SONOFF ZBMINI Zigbee mini smart light switch
- Zooz ZEN72 Z-Wave in-wall dimmer
- UltraPro 39351 Z-Wave in-wall smart dimmer
- Enbrighten 43080 Zigbee in-wall dimmer
- Leviton DG6HD Zigbee in-wall dimmer
- AMAKER WKC-002 Zigbee in-wall smart switch
- Enbrighten 43096-2 Zigbee plug-in dual smart switch
- UltraPro 39348 Z-Wave in-wall smart switch
- Shelly 1 Wi-Fi relay switch
- WiZ Connected Wi-Fi smart plug
- LIFX LA19LW06E26CA Wi-Fi smart LED light bulb

## Supported Models

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- Crestron CP4-R
- MC4-R
- Hubitat Elevation C-7 hub

## Contact Information

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Company:	NC Systems, Inc.
Author:	William Brewer
Email:	<a href="mailto:william@ncsystemsinc.com">william@ncsystemsinc.com</a>
Website:	<a href="https://ncsystemsinc.com">https://ncsystemsinc.com</a>
License:	<a href="https://ncsystemsinc.com/products/lights">https://ncsystemsinc.com/products/lights</a>

## Version History

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1.0101.04                      2/25/2023

Changes since Last Version

New Features

- Remove the display of unused Programmable Operations from the Actions & Events page.

1.0101.03                      1/31/2023

Changes since Last Version

New Features

- Added support for Wi-Fi devices.
- Increased maximum number of devices supported to 16.
- Developer company changed from Bliss Home Theaters and Automation, Inc. to NC Systems, Inc.

1.0101.02                      11/17/2022

Changes since Last Version

New Features

- Improved accuracy in display of slider status feedback.
- Additional devices tested and evaluated.

1.0101.01                      10/12/2022

Changes since Last Version

New Features

- Initial release

## Licensing and Copyright Information

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