

NC Systems, Inc.

Release Notes

Extension Driver – Hubitat – Relay API – Relay – IP version 1.0301.02

Extension Driver

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

The HUBITAT:Relay 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 driver's user interface permits the setup and testing of both momentary and latching relays that can then be connected to and controlled from Crestron Home End App. The driver provides Programmable Operations in the Actions section of the Actions & Events page of the Crestron Home Setup App, permitting either the pulse control of momentary relays or the on/off control of latching relays.

This driver supports the control of such devices as pumps, valves, motors, gate locks, and garage door openers.

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:Relay 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

The driver requires a Hubitat Elevation C-7 automation hub to operate. This driver can support up to 16 relays per instance. Although the driver could support a larger number of relays, a limit of 16 was selected to limit the amount of scrolling needed to view all relays 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

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

Installation of the HUBITAT:Relay 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:Relay driver (Drivers->Relay->Hubitat->Relay 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 relay actions in the Actions & Events section as needed

Two videos in the Tutorials section of the 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:Relay driver communicates with Z-Wave, Zigbee, and Wi-Fi devices is via the Hubitat Maker API app. The Maker API app aggregates multiple diverse relay 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:Relay driver.

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

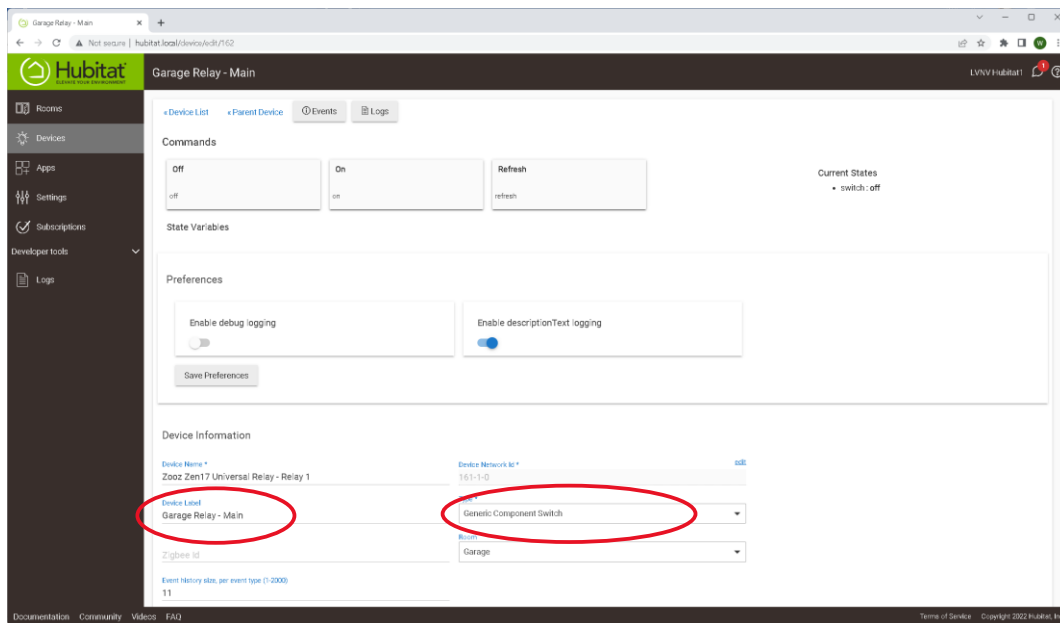
Once the devices have been acquired, the Hubitat App Devices page can be used to select and configure each device. In the Commands section of the Device control page shown below, each device can be operated directly from the Hubitat App.

Z-Wave, Zigbee, and Wi-Fi relays and switches have only two Preference settings that allow debug and description text logging. Enable description Text logging to see device operation in the Hubitat Logs. Key Preferences to look for and to set are:

- 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 a name that will be used as the label for the Relay controls in the End-User App. The Device Label can be changed if desired.

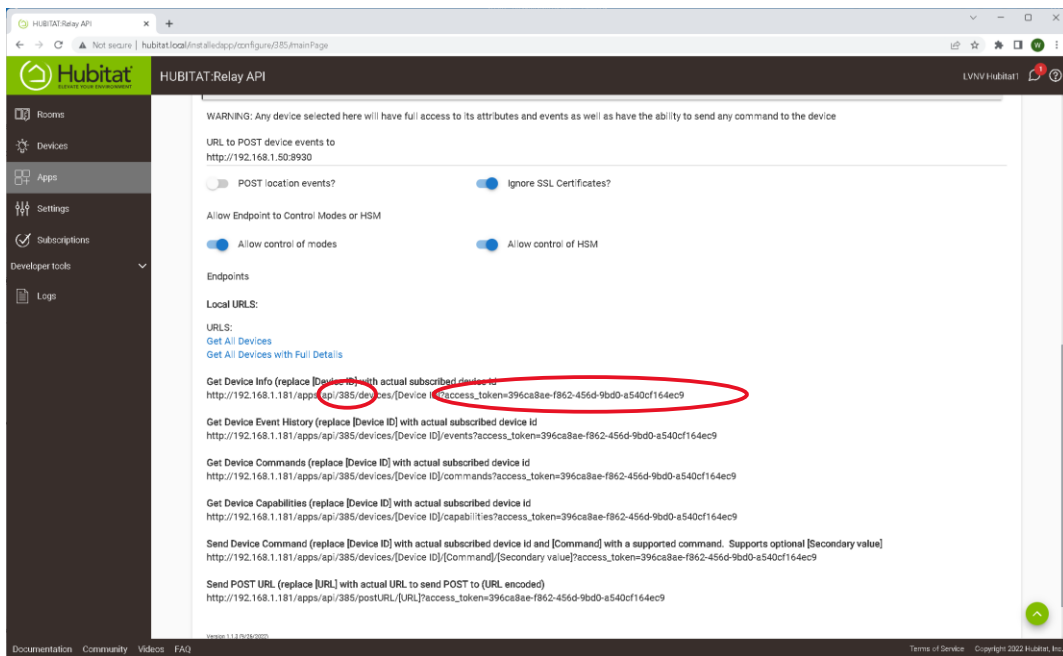
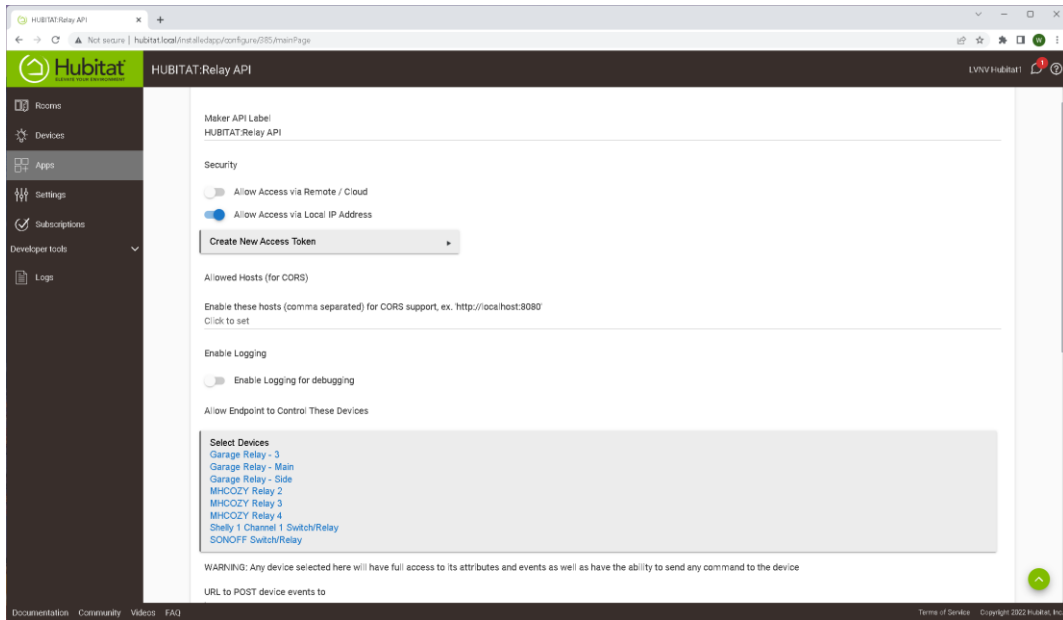


To add a Wi-Fi device, go to the Devices page of the Hubitat App and click the “Add Device” button. Typically, only Wi-Fi devices having a Protocol listed as LAN from the Hubitat List of Compatible Devices (<https://docs2.hubitat.com/en/devices/list-of-compatible-devices>) should be used to ensure that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



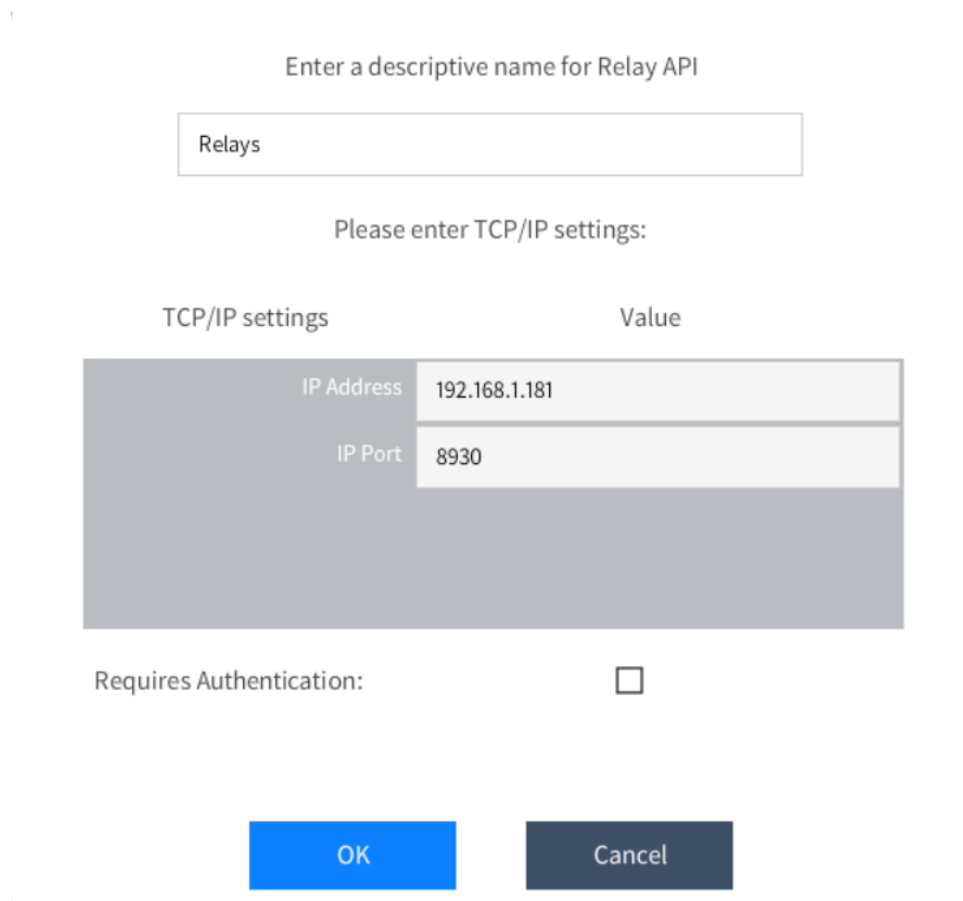
Further down on the same page, in the Local URLs section, the Maker API App ID and Access Token values are found. These values must be entered in the Installer Settings page of the Crestron Home Setup App when a new instance of the driver is installed. The small red oval above highlights where the Maker 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:Relay 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 Relay and select it. When a list of Relay manufacturers is shown select Hubitat. The Relay 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:Relay 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 Relay API

Relays

Please enter TCP/IP settings:

TCP/IP settings	Value
IP Address	192.168.1.181
IP Port	8930

Requires Authentication: ☐

OK Cancel

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

Relays Settings

About

Control

Installer Settings

Advanced

i License Key Please go to https://NCSystemsInc.com to obtain the necessary license key. The driver will operate without a license key for 2 hours.	B3A13802-97A6-11A8-F8CD-7076005120
i Relay Control Title Enter the title of the Relay Control page	Relays
i Hubitat Maker App ID Enter the Hubitat Maker App ID	385
i Hubitat Access Token Enter the Hubitat Access Token	396ca8ae-f862-456d-9bd0-a540cf164ec
i Visible in Home Page Show a Tile in the Home Page	☒
i Visible in Room Page Show a Tile in the Room Page	☒
i Settings Button Visible Show the Settings Button	☒

OK

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.

Relay Control Title – A descriptive title that appears at the top of page containing the relay 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.

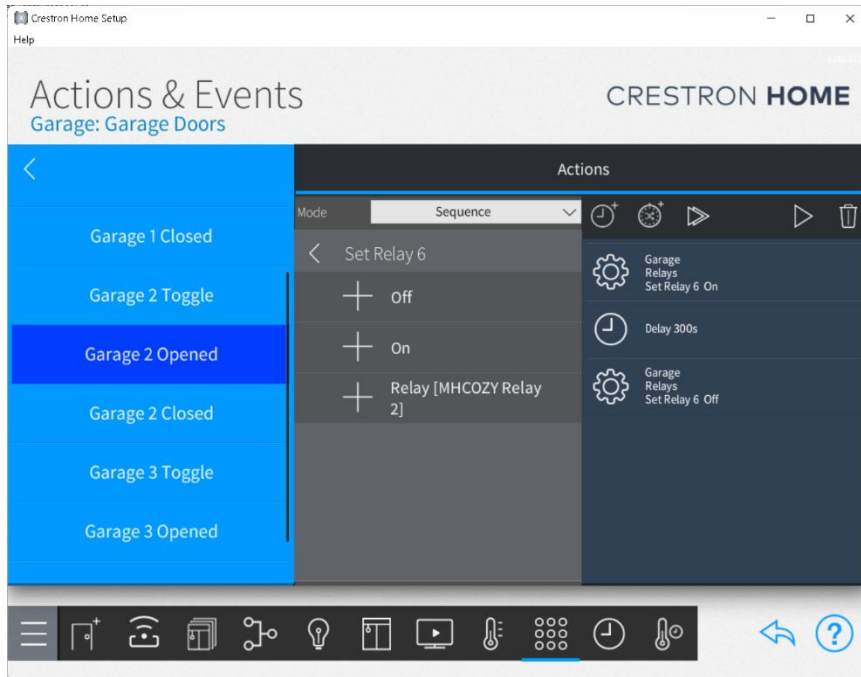
Visible in Room Page – Check to cause a tile to be shown on the Room Page.

Settings Button Visible – Check to show the Settings button on the Relay 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:Relay Actions

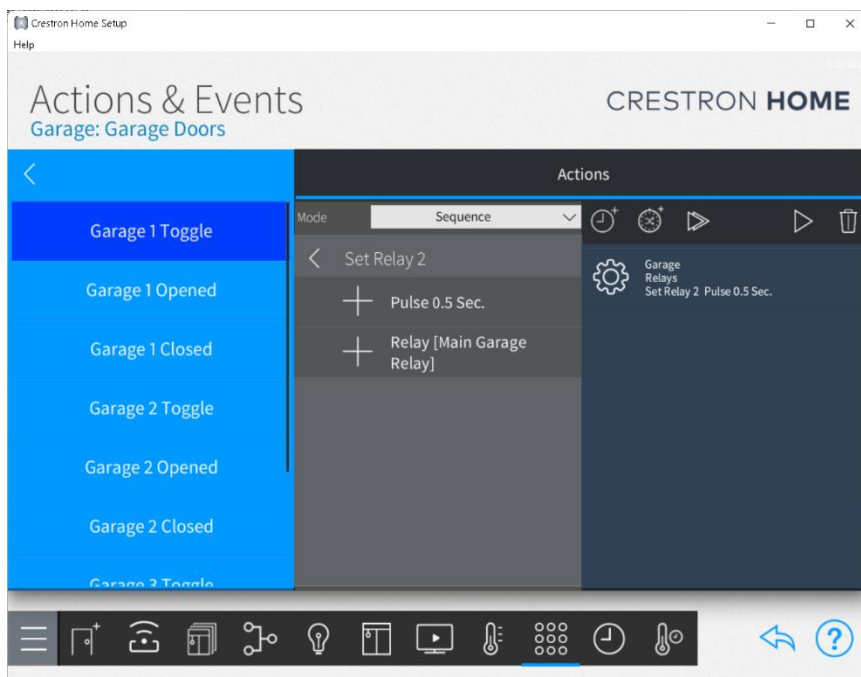
The HUBITAT:Relay driver makes On/Off/Pulse relay control for devices available on the Setup App Actions & Events page to be used in any sequence triggered by any Event. Depending on whether the relay is momentary or latching, the following two types of Actions pages will be presented. Note that the last setting shown is the name of the relay being controlled and if selected will not perform any operation.



Latching Relays

The available controls for latching relays are On and Off.

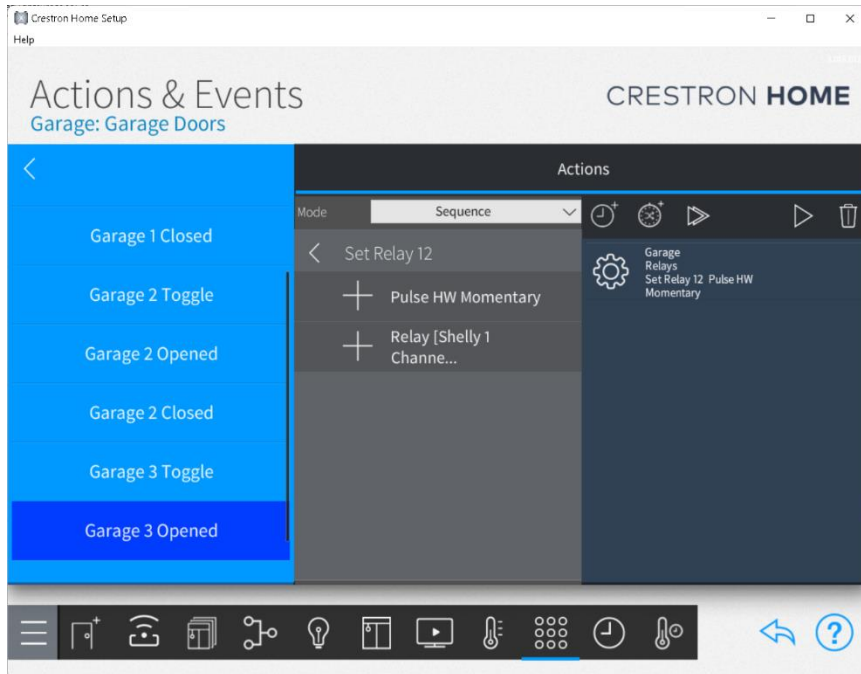
The last setting for a relay is the name of the relay. If the relay name is selected as an action, no operation is performed when the sequence is executed.



Momentary Relays

The only available control for momentary relays is a pulse command. The pulse command turns on the relay, waits the duration of the pulse, and turns off the relay.

The pulse duration that is specified on the Settings page in the End-User App is shown after the word "Pulse". When pulse duration values are changed in the End-User App, they will appear on this page the next time a relay is selected.

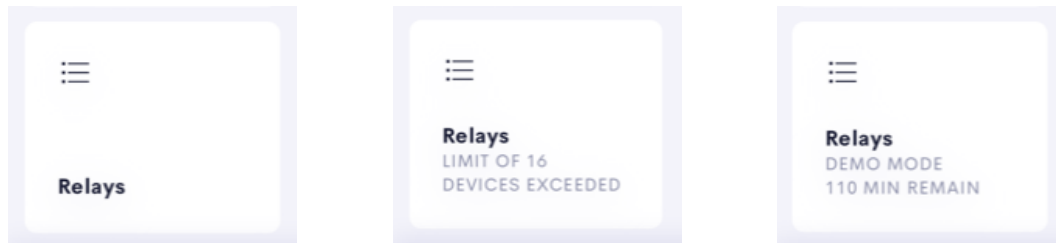


Hardware Momentary Relays

The pulse description “HW Momentary” refers to a relay that has been configured to be a hardware momentary relay.

End-User Experience

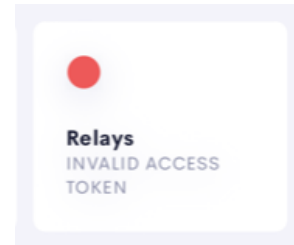
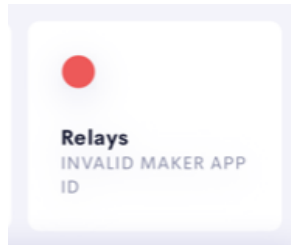
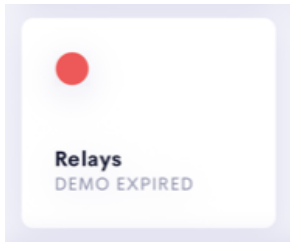
The Room Tile for this driver reflects either normal operation of a licensed driver or one of several possible demo mode or error conditions.



Left: Normal Operation – All Relays are operational.

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 information entered during the Demo Mode period(s) will remain after a valid license key is provided.



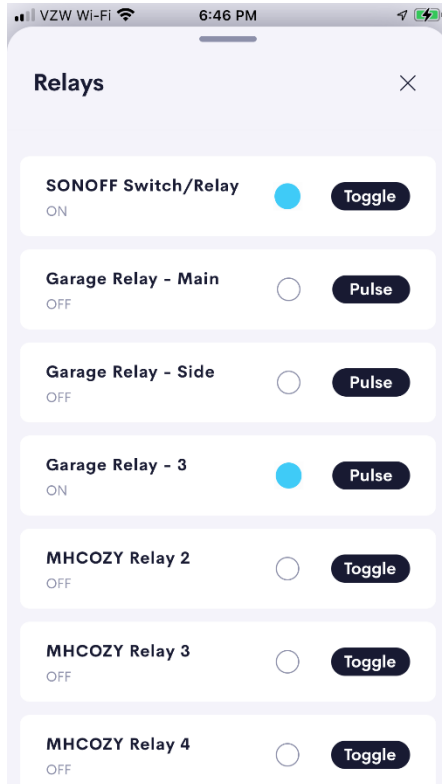
Left: Demo Mode Expired – When the Demo Mode expires, the Room Tile will show a red dot and a Demo Expired status. The driver will be disabled. When the Demo Mode expires, a reboot of the system or changing any item on the Installer Settings page will restart the 120-minute Demo Mode period. If an invalid 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 Relay Controls page where controls for each relay in the API for the driver are shown.



Relay Controls

The Relay Controls page contains one control for each relay included in the Hubitat Maker API App. The name of each relay is the name given in the Device Information / Device Label field of the Hubitat App Device page. Latching relays will have a control button labeled Toggle and Momentary relays will have a control button labeled Pulse. When a relay is on, a blue dot and a status text of "ON" will be shown, otherwise an empty dot and "OFF" will be shown.

The number of relay 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 will be set to 16, the status text on the House and Room tiles will be set to "LIMIT OF 16 DEVICES EXCEEDED", and an error message will be entered in the system error log.

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.

VZW Wi-Fi 6:48 PM

Settings

CHECK FOR MOMENTARY RELAY, UN-CHECK FOR LATCHING RELAY

SONOFF Switch/Relay
LATCHING RELAY ☐

(1-3000) 1/10TH SEC PULSE, 0 HW MOMENTARY
1

Garage Relay - Main
MOMENTARY RELAY ☒

(1-3000) 1/10TH SEC PULSE, 0 HW MOMENTARY
5

Garage Relay - Side
MOMENTARY RELAY ☒

(1-3000) 1/10TH SEC PULSE, 0 HW MOMENTARY
5

Settings Page

The Settings Page provides Checkbox controls to specify whether a relay is a latching or momentary type and Text Entry controls to specify the pulse duration of a momentary relay.

Check the entry for any relay that will be used as a momentary relay. Un-check the entry for any relay that will be used as a latching relay. When a relay is set to momentary, the relay control button will be set to Pulse, and when a relay is set to latching, the relay control button will be set to Toggle.

The pulse duration values are entered in tenths of seconds and cover a range of one tenth of a second to five minutes. Enter a zero if the relay hardware has been configured as a momentary relay.

The pulse duration 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 pulse duration value.

VZW Wi-Fi 6:48 PM

Settings

MHCOZY Relay 4
LATCHING RELAY ☐

(1-3000) 1/10TH SEC PULSE, 0 HW MOMENTARY
1

Shelly 1 Channel 1 Switch/R...
MOMENTARY RELAY ☒

(1-3000) 1/10TH SEC PULSE, 0 HW MOMENTARY
0

RESYNCRONIZE HUBITAT DEVICE LIST

Resync

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 Relay Controls Page and Settings Page are immediately updated to reflect the changes made in the Hubitat App.

Limitations/Known Issues

Due to the time variations in providing status feedback among different brands of relays, the display of status text and status icon values will often be omitted when a pulse duration of less than 4 tenths of a second is specified for a momentary relay.

Supported Features

The HUBITAT:Relay driver supports the following user features:

- Ability to set any latching relay on/off
- Ability to pulse any momentary relay
- Ability to display current status of relays directly controlled by a user
- Ability to set any relay to either latching or momentary operation
- Ability to specify momentary relay pulse durations from one tenth of a second to five minutes.
- Availability of all On/Off/Pulse commands for all relays on Actions & Events page of the Setup App

Test Environment

The HUBITAT:Relay 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
- Zooz ZEN17 Z-Wave Universal Relay
- MHCOZY 4 Channel Zigbee Relay Switch
- SONOFF ZBMINI Zigbee mini smart light switch
- Shelly 1 Wi-Fi relay switch

Supported Models

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

Contact Information

Company:	NC Systems Inc.
Author:	William Brewer
Email:	william@NCSystemsInc.com
Website:	https://NCSystemsInc.com
License:	https://NCSystemsInc.com/products/relay

Version History

1.0301.02

2/25/2023

Changes since Last Version

New Features

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

1.0301.01

2/1/2023

Changes since Last Version

New Features

- Initial release

Licensing and Copyright Information

Certain Crestron products contain open-source software. For specific information, please visit www.crestron.com/opensource

© 2023 NC Systems, Inc, all rights reserved