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Operations Guide

.AV Framework™ Software for Crestron Virtual Control Software

Crestron Electronics, Inc.

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Introduction

Crestron® .AV Framework™ software is a web-based management solution that is used to deploy scalable Crestron enterprise room solutions without requiring any programming. The .AV Framework configuration utility is accessible from most web browsers and provides the following functions:

- Select sources and displays.
- Configure device control for Blu-ray Disc® players, cable TV boxes, and video servers.
- Add a compatible touch screen to generate the GUI for one or more display systems.
- Add a compatible button panel to control single display systems.
- Add an occupancy sensor for additional system automation.
- Connect to Crestron Fusion® software to monitor and control basic room data, system power, source selection, and room scheduling.
- Customize the .AV Framework user experience with extra components, custom functionality, and corporate logos.

.AV Framework is compatible with the Crestron Virtual Control server-based control system. Add the .AV Framework program to a room on the Crestron Virtual Control server, and then add a supported Crestron A/V autoswitcher device or a virtual switcher device (via a compatible display or projector) for complete configuration and control.

This document provides instructions for setting up the .AV Framework program on the Crestron Virtual Control server and explains the setup screens and functions provided in the .AV Framework configuration utility.

> **NOTE:** This document is current as of the .AV Framework 7.04 release.

The following supplemental documents are available:

- For more information on Crestron Virtual Control, refer to the Crestron Virtual Control Server Software Product Manual.
- For more information on integrating the Crestron Virtual Control server in an existing intranet site using the secure REST API platform, refer to the REST API for Crestron Virtual Control Programming Guide.

What's New?

Updates to .AV Framework™ software and this document and described below from newest to oldest.

March 24, 2026

- **.AV Framework 7.04 Released**
  - Refer to the release notes posting on the Crestron website for detailed information about this release.
- **Documentation Updates**
  - Added MPC4-301 and MPC4-302 to the Works with .AV Framework Software Reference Guide.

September 9, 2025

- **.AV Framework 7.03 Released**
  - Refer to the release notes posting on the Crestron website for detailed information about this release.
- **Documentation Updates**
  - Added DM-NVX-385, DM-NVX-385C, MPC4-102, and MPC4-201 to the Works with .AV Framework Software Reference Guide and Product Features on page 4.

January 28, 2025

- **.AV Framework 7.01 Released**
  - Refer to the release notes posting on the Crestron website for detailed information about this release.
- **Documentation Updates**
  - Updated procedures in Setup on page 11 to reflect the default .AV Framework project that is included with VC-4.

- Updated Configuration on page 39 as follows:
  - Removed section on activation (most .AV Framework functions no longer require reactivating the system).
  - Added information on third-party microphone devices and drivers to Audio Settings on page 59.
  - Added information about new touch screen custom graphics setting that changes the default start page in the user project to Touch Screen Custom Graphics on page 61.
  - Updated Lighting on page 88 with information about changing the room for platform devices that support grouping presets by room.
  - Added note to A/V Routing on page 84 that a maximum of 15 inputs and 8 outputs are supported by .AV Framework.
- Updated Operation on page 90 with information about new **Room Cameras** page and functionality.
- Added Camera and Microphone device types to Appendix B: Device Configuration on page 141.

Product Features

The following table shows the devices and product features that are compatible with .AV Framework for Crestron Virtual Control (VC-4).

.AV Framework for Crestron Virtual Control Feature Comparison Chart

Feature Class	Product/Feature	Supported?
AV Switchers	AM-200	Yes
	AM-300	Yes
	AM-3200(-WF)	Yes
	Crestron Virtual Switchers	Yes
	HD-MD-200-C-E(-1G)	Yes
	HD-MD-300-C-E	Yes
	HD-MD-400-C-E(-2G)	Yes
	HD-MD2X1-8K	Yes
	HD-MD4X1-4KZ-E	Yes
	HD-MD4X2-4KZ-E	Yes
	HD-MD8X4-4KZ-E	Yes
	HD-MD402	Yes
	HD-MD421	Yes
	HD-PS401/402	Yes
	HD-PS621/622	Yes
	HD-RX-4K-210-C-E(-POE)	Yes
	HD-RX-4K-410-C-E(-SW4)	Yes
	HD-RX-4K-510-C-E(-SW4)	Yes
	HD-RXU-4KZ-202	Yes
	HD-TXU-4KZ-211(-CHGR)	Yes
	Third-Party Switchers (via device drivers)	Yes

Feature Class	Product/Feature	Supported?
Button Panels	MP-B10 (Ethernet)	Yes
	MP-B10 (Cresnet)	Yes[1]
	MP-B20 (Ethernet)	Yes
	MP-B20 (Cresnet)	Yes[1]
	MPC3-101 Button Mode (Ethernet)	Yes
	MPC3-102 Button Mode (Ethernet)	Yes
	MPC3-201 Button Mode (Ethernet)	Yes
	MPC3-302 Button Mode (Ethernet)	Yes
Cable Management	TT-100 (Cresnet)	Yes[1]
	TT-100 (USB)	No
Digital Graphics Engines	DM-DGE-200-C	No
DM NVX® AV-over-IP Distribution Systems	DM-NVX-350/-350C	Yes
	DM-NVX-351/-351C	Yes
	DM-NVX-352/-352C	Yes
	DM-NVX-360/-360C	Yes
	DM-NVX-363/-363C	Yes
	DM-NVX-384/-384C	Yes
	DM-NVX-385/-385C	Yes
	DM-NVX-D10/D20	Yes
	DM-NVX-D30/-D30C	Yes
	DM-NVX-D200	Yes
	DM-NVX-D80-IOAV	Yes
	DM-NVX-E10/E20	Yes
	DM-NVX-E30/-E30C	Yes
	DM-NVX-E760/-E760C	Yes
	DM-NVX-SW-310	Yes

Feature Class	Product/Feature	Supported?
Endpoint Receivers	DM-RMC-4K-100-C(-1G)	Yes (with supported AV switcher)
	DM-RMC-100-C	Yes (with supported AV switcher)
	DM-RMC-200-C	Yes (with supported AV switcher)
	HD-RX-101-C(-1G)-E	Yes (with supported AV switcher)
	HD-RX-4KZ-101(-1G)	Yes (with supported AV switcher)
	HD-RXC-101-C(-1G)-E	Yes (with supported AV switcher)
	HD-RXC-4KZ-101(-1G)	Yes (with supported AV switcher)
	HD-RXU-4KZ-101-E	Yes (with supported AV switcher)
	HD-RXU-4KZ-202	Yes (with supported AV switcher)

Feature Class	Product/Feature	Supported?
Endpoint Transmitters	DM-TX-200-C-2G	Yes (with supported AV switcher)
	DM-TX-201-C	Yes (with supported AV switcher)
	DM-TX-401-C	Yes (with supported AV switcher)
	DM-TX-4K-100-C-1G	Yes (with supported AV switcher)
	DM-TX-4K-202-C	Yes (with supported AV switcher)
	DM-TX-4K-302-C	Yes (with supported AV switcher)
	DM-TX-4KZ-100-C-1G	Yes (with supported AV switcher)
	DM-TX-4KZ-202-C	Yes (with supported AV switcher)
	DM-TX-4KZ-302-C	Yes (with supported AV switcher)
	HD-TX-101-C(-1G)-E	Yes (with supported AV switcher)
	HD-TX-201-C-2G-E	Yes (with supported AV switcher)
	HD-TX-301-C(-2G)-E	Yes (with supported AV switcher)
	HD-TX-4KZ-101(-1G)	Yes (with supported AV switcher)
	HD-TX-4KZ-111(-1G)	Yes (with supported AV switcher)
	HD-TX-4KZ-201	Yes (with supported AV switcher)
	HD-TX-4KZ-211-2G/-CHGR	Yes (with supported AV switcher)
	HD-TX-4KZ-401	Yes (with supported AV switcher)
	HD-TX-4KZ-421-CHGR	Yes (with supported AV switcher)
	HD-TXC-101-C(-1G)-E	Yes (with supported AV switcher)

Feature Class	Product/Feature	Supported?
	HD-TXC-4KZ-101(-1G)	Yes (with supported AV switcher)
	HD-TXU-4KZ-111-E	Yes (with supported AV switcher)
	HD-TXU-4KZ-211(-CHGR)	Yes (with supported AV switcher)
I/O Modules	C2N-IO	Yes[1]
	CEN-IO-COM-102	Yes
	CEN-IO-IR-104	Yes
	CEN-IO-IR-204	Yes
	CEN-IO-RY-104	Yes
	CEN-IO-RY-204	Yes
	DIN-CEN-CN-2(-POE)	Yes
	DM-NAX-XSP	Yes
	HD-CTL-101	Yes
	HD-MD2X1-8K	Yes
Occupancy Sensors	CEN-ODT-C-POE	Yes
	GLS-ODT-C-CN	Yes
	GLS-OIR-C-CN	Yes
Room Scheduling	SSW/SSC/SIW-PCB	Yes[1]
Scalers	DM-RMC-SCALER-C	Yes (with supported AV switcher)
	DM-RMC-4K-SCALER-C	Yes (with supported AV switcher)
	DM-RMC-4KZ-SCALER-C	Yes (with supported AV switcher)

Feature Class	Product/Feature	Supported?
Third-Party Devices (Drivers)	Audio Mixers	Yes
	A/V Switchers	Yes
	Blu-ray® Disc Players	Yes
	Cable Boxes	Yes
	Cameras	Yes
	Custom Conferencing Devices	Yes
	Displays	Yes
	Lights (Platform)	Yes
	Microphones	Yes
	Projectors	Yes
	Video Servers	Yes
	Driver Portal Search/Import	Yes
Touch Screens	TSW-752	Yes
	TSW-1052	Yes
	TSW-760(-NC)	Yes
	TSW-1060(-NC)	Yes
	TS/TSW-770(-GV)	Yes
	TS/TSW-1070(-GV)	Yes
	TST-1080	Yes
	Desktop XPanel	Yes
USB Extenders	DM-NUX-L2/-R2	Yes
Wireless Presentation	AM-100	Yes
	AM-101	Yes
	AM-200	Yes
	AM-300	Yes
	AM-3000/-WF	Yes
	AM-3100/-WF	Yes
	AM-3200/-WF	Yes
Projector Screen	Relay Control	Yes (with CEN-IO-RY-204)
Volume Control	DSP	No
	Display/Projector	Yes

Feature Class	Product/Feature	Supported?
Displays	Number of Uniquely Routed Displays	1
	Number of Mirrored Displays	7
	External Amplifier Support	Yes
Sources	Max Number of Sources	4 (HD-MD) or more
Crestron Fusion	Scheduling	Yes
	Monitoring/Reporting	Yes
Customization	Custom Logo Graphic	Yes
	Screensaver	Yes
	Start Button	Yes
	Custom Start Button Text	Yes
	Help Page Customization	Yes
Video Routing	Manual (from Touch Screen)	Yes
	Advanced Routing	No
	Default Route Selection	Yes
	Audio Breakaway	Yes
Authentication	Multiple Login	Yes
Other	Automatic Load and Update of Touch Screen Project	Yes
	Room Power Modes	Yes
	Cisco Touch 10® Custom Conferencing Application	Yes
	Google Meet™ Video Conferencing System	Yes
	Microsoft Teams® Software Application	Yes
	Zoom Rooms™ Software Controller Configuration	Yes

[1] Requires an external Crestron control module gateway.

Setup

Use the following procedures to set up .AV Framework for Crestron Virtual Control.

> **NOTE:** As of the .AV Framework 6.19 release, the Crestron Virtual Control installation must be configured to use TLS and PAM (Pluggable Authentication Module) in order to run .AV Framework. Once these authentication settings have been configured, an HTTPS URL is required to access the configuration utility. For more information on hardening the Crestron Virtual Control installation, refer to the Crestron Virtual Control Server Software Product Manual.

Load the Program Files

As of the .AV Framework 7.01 release, the .AV Framework program is loaded to Crestron Virtual Control software by default and can be assigned to new or existing rooms. Older versions of .AV Framework can still be loaded to the Crestron Virtual Control server manually as described below.

The .AV Framework program files can be downloaded from the VC-4 device product page or from the Crestron Resource Library at www.crestron.com/Support/Resource-Library.

The zipped package file includes the following components:

> **NOTE:** The program and project files must be used as a version-matched pair and cannot be edited or customized.

- A Crestron Construct™ IDE project archive (.ch5z) for HTML5 projects (AVF UI 3.0 only)
- Web XPanel interface (.zip) files
- Configuration page files (index.zip)

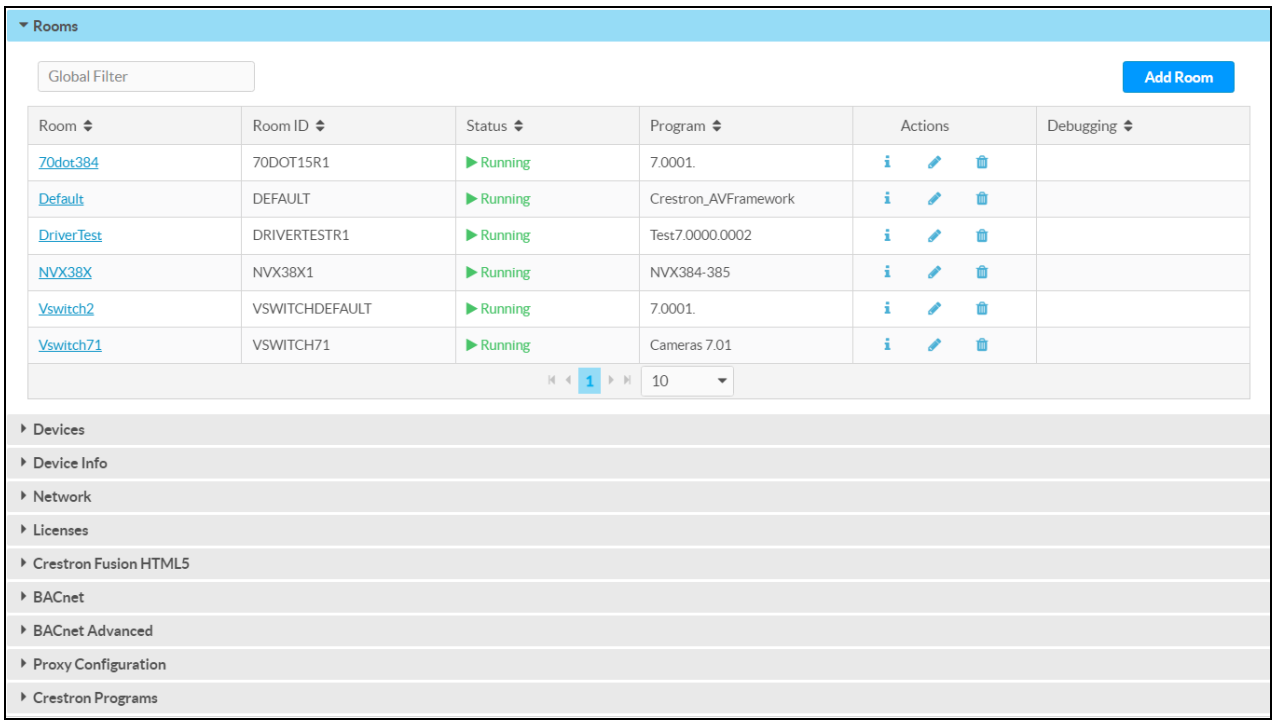
To upload an older version of the .AV Framework program to the Crestron Virtual Control server:

> **NOTE:** The Crestron Virtual Control server must be installed and configured completely prior to loading the .AV Framework program. For more information, refer to the Crestron Virtual Control Server Software Manual.

1. Download and extract the contents of the .AV Framework for Crestron Virtual Control zipped package file to a location on the network that can be accessed by the Crestron Virtual Control web user interface.
2. Enter "https://[ServerURL]/VirtualControl/config/settings/" into a supported web browser, where [ServerURL] is the IP address or host name of the VC-4-PC-3 or the Linux® software platform where the Crestron Virtual Control service is installed.

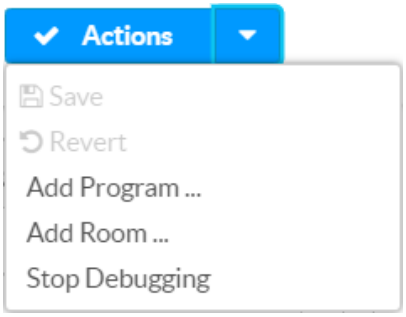
The Crestron web user interface is displayed with the **Status** > **Rooms** page open by default.

Crestron Virtual Control Web User Interface



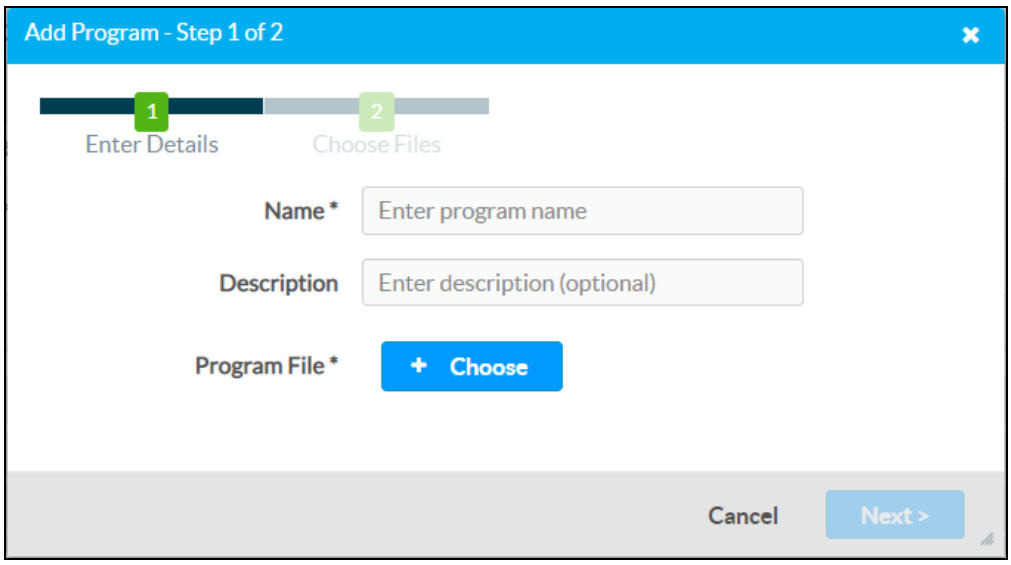
3. Select **Add Program** from the **Actions** drop-down menu on the top-right of the configuration utility.

Actions Menu



The **Add Program** dialog box is displayed.

Add Program Dialog Box - Enter Details



4. Enter a user-defined name for the program and a description (optional) in the appropriate text fields.
5. Select **Choose**, navigate to the extracted package file contents on the network, and select the .AV Framework .cpz program file.
6. Select **Next**.
7. Select **Choose** next to a file type to select the necessary .AV Framework program file, and then select **Upload** to upload the file to the program. The following files must be uploaded:
   a. For **XPanel (Web)**, select and upload the XPanel .zip file.

      NOTES:

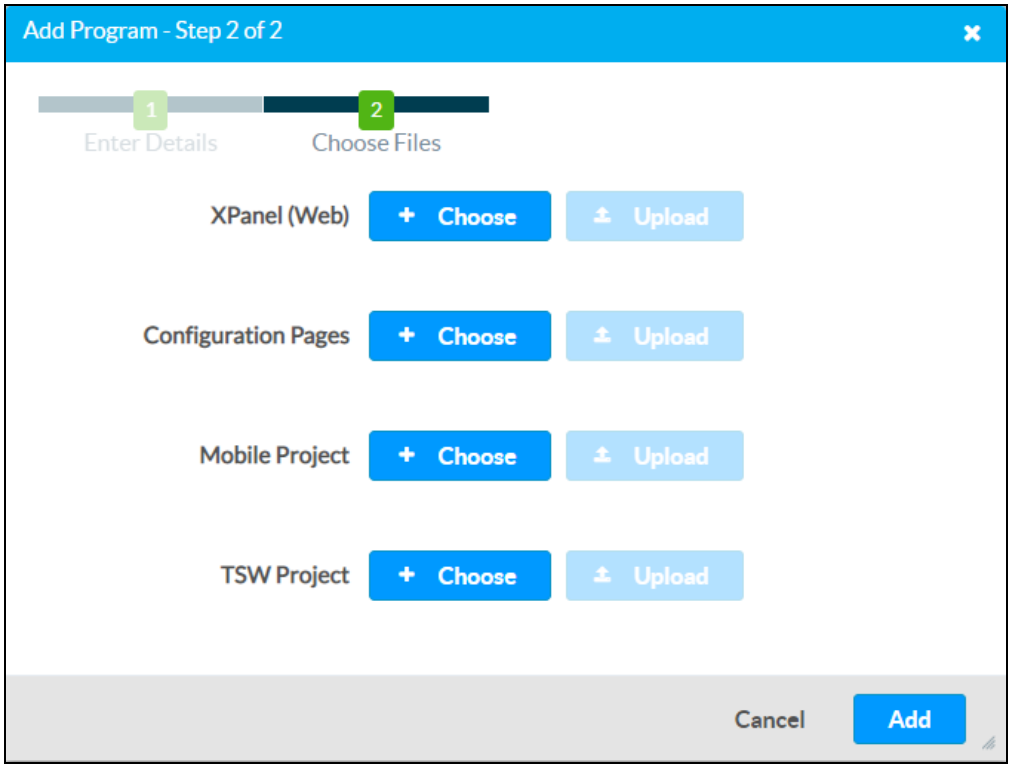
      - The zipped .AV Framework package for Crestron Virtual Control contains zipped XPanel files for the AVF 3.0 user interface only.
      - Custom HTML5 Web XPanel .ch5z archive files can be loaded to .AV Framework in place of the provided XPanel files. For more information, refer to XPanel on page 121.

   b. For **Configuration Pages**, select and upload the index.zip file.
   c. For **TSW Project**, select and upload the Crestron Construct project archive (.ch5z) file.

NOTES:

- The zipped .AV Framework package for Crestron Virtual Control contains a .ch5z file for the AVF 3.0 Crestron Construct user interface. The Crestron Construct project archives are not compatible with TSW-52 series touch screens.
- If no touch screen project is loaded, the auto update function can be used to update and load touch screen projects automatically. For more information on loading touch screen projects, refer to Appendix F: Load Touch Screen Projects on page 180.

Add Program Dialog Box - Choose Files



8. Select **Add**. The program files are added to the Crestron Virtual Control installation.

The touch screen project files can be loaded to a supported touch screen or to XPanel as a custom project. The touch screen project provides a user interface for controlling the .AV Framework system.

- For more information on loading the .ch5z file to a supported touch screen, refer to the appropriate touch screen documentation at www.crestron.com/manuals.
- For more information on loading .ch5z files to generate an HTML Web XPanel interface, refer to HTML5 Web XPanel Configuration on page 122.
- For more information on loading a legacy .vtz file to the Desktop XPanel software, refer to Desktop XPanel Configuration on page 125.

Add .AV Framework Rooms

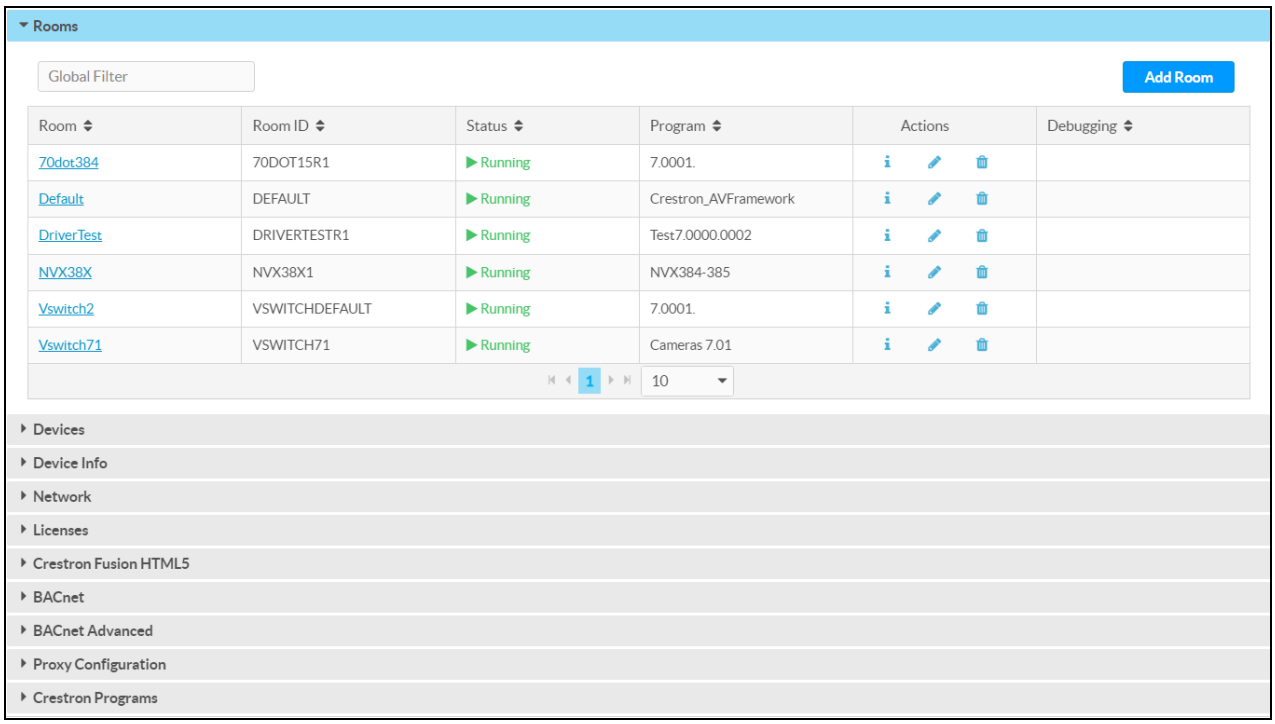
The .AV Framework program can be used to add one or more rooms to the server.

For more information on adding and using rooms with Crestron Virtual Control, refer to the embedded help file by selecting the help button on the top right of the configuration utility.

To add the .AV Framework program to a room:

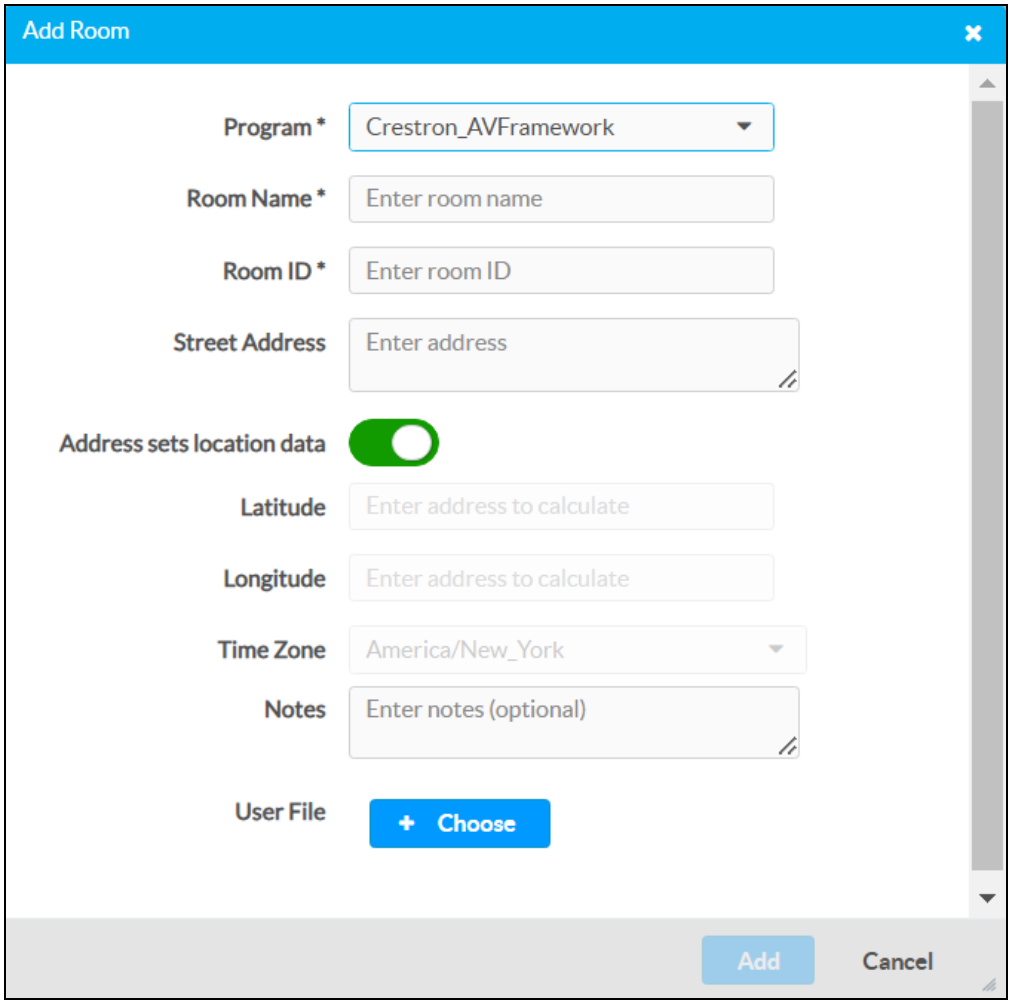
1. Select the **Status** tab.
2. Select the **Rooms** accordion (if it is not open already).

Status Tab - Rooms



3. Select **Add Room**. The **Add Room** dialog box is displayed.

Add Room Dialog Box



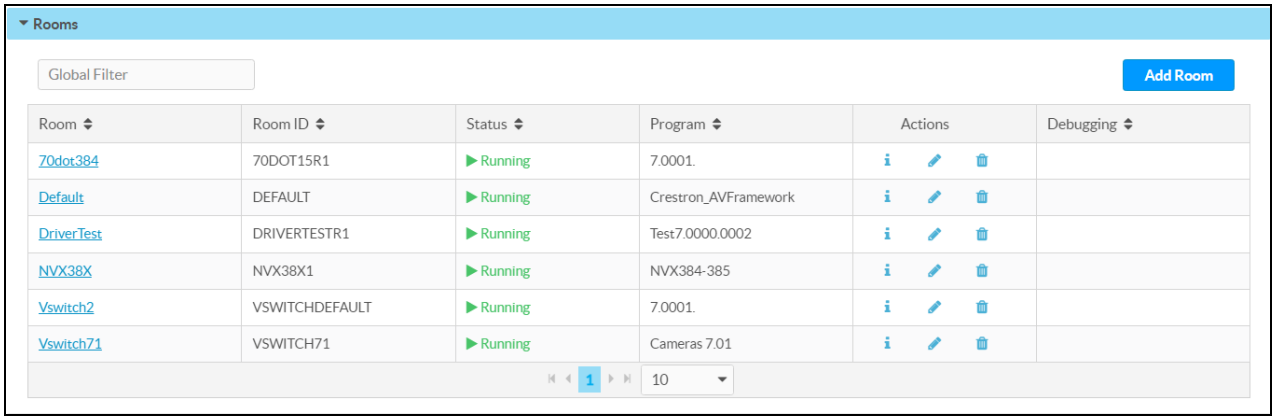
4. Use the **Program** drop-down menu to select the .AV Framework program. **Crestron_AVFramework** is the default .AV Framework program that is included with the VC-4 installation.
5. Enter a room name, room ID, location information (optional), and notes (optional) using the appropriate text fields and drop-down menus.

NOTES:

- Multiple rooms can run the same .AV Framework program. However, each room must have a unique room name and room ID to differentiate each program instance.
- The name entered in the **Room Name** text field dictates the name of the associated .AV Framework room when it is created. Any change made to the room name in the Crestron Virtual Control web interface or in .AV Framework is reflected in both locations. This synchronization can be turned off using the **System Setup** settings in .AV Framework. For more information, refer to System Settings on page 54.

6. Select **Add**. A notification appears if the room is saved successfully, and the room is added to the list of rooms on the **Status** > **Rooms** page. After initialization, the program status should change to **Running**.

   Status Tab - Rooms (Room Added)



7. Repeat steps 3–6 for any other rooms that will be added using the .AV Framework program.

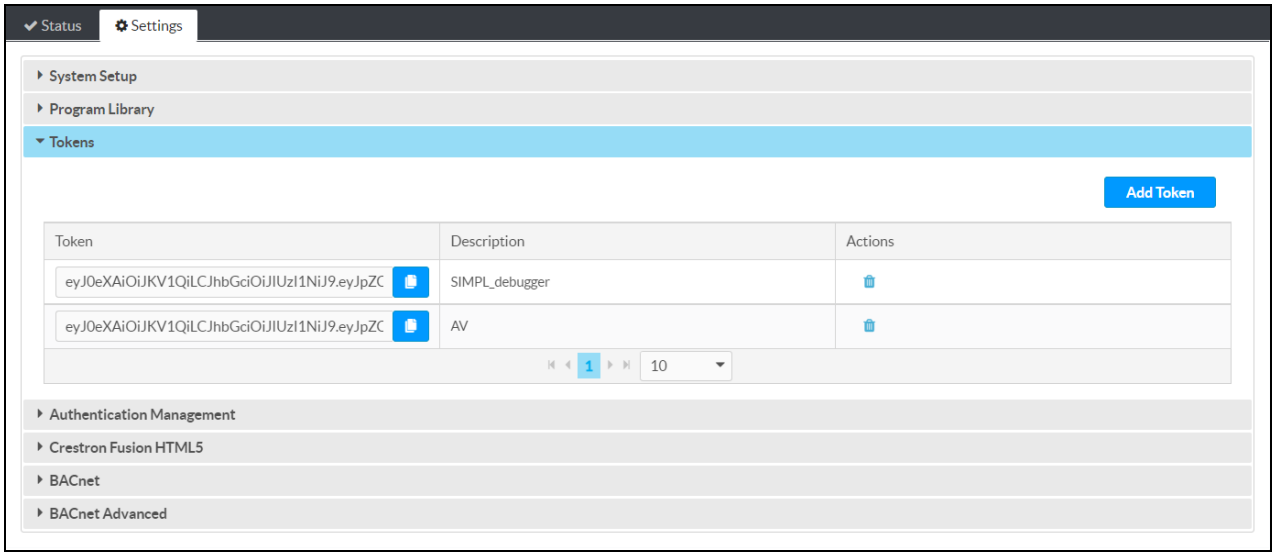
Generate an Authentication Token

A token generated by the Crestron Virtual Control server is required to access the .AV Framework configuration utility prior to initial login. The Crestron Virtual Control server authenticates this token when the login request is sent.

To generate an authentication token:

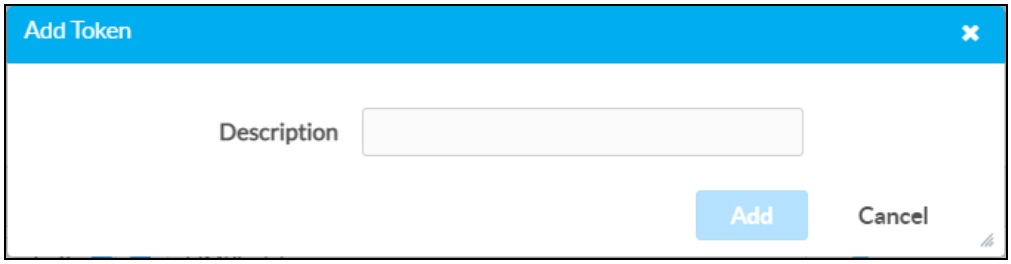
1. Select the **Settings** tab.
2. Select the **Tokens** accordion.

   Settings Page - Tokens



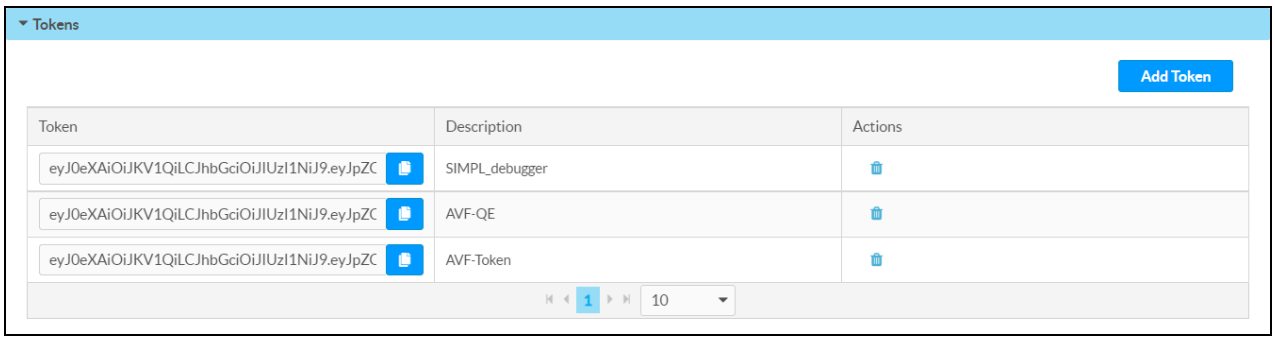
3. Select **Add Token**. The **Add Token** dialog box is displayed.

Add Token Dialog Box



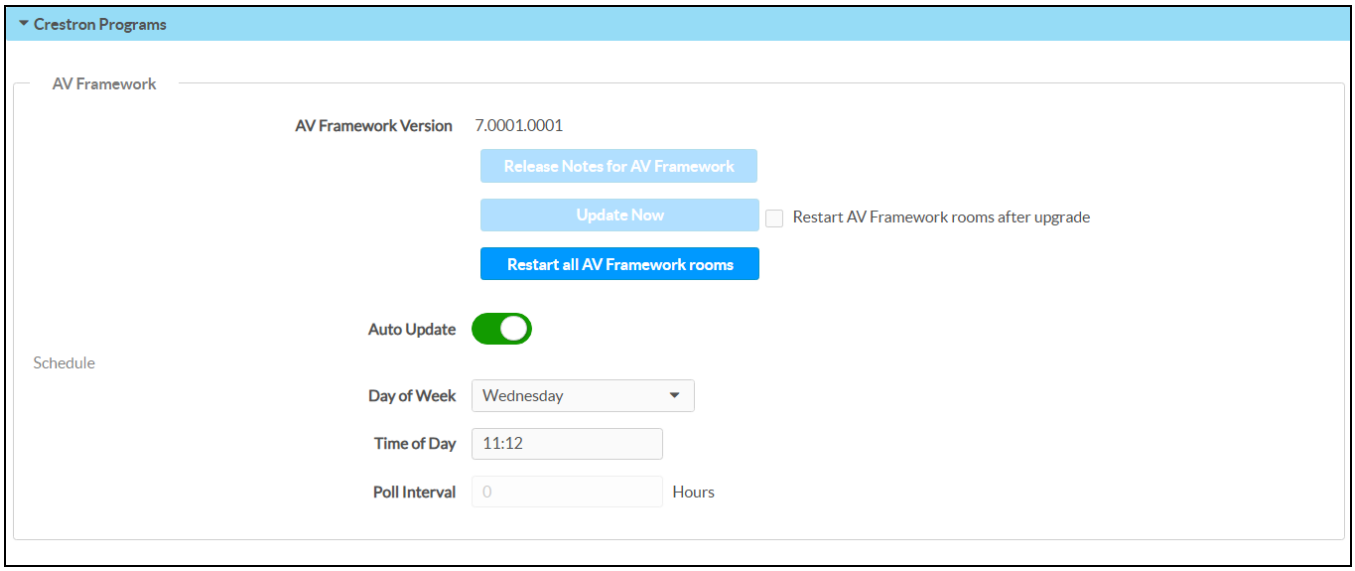
4. Enter a descriptive name for the token in the **Description** text field.
5. Select **Add**. A token is generated and added to the interface.

Tokens Accordion (New Token Added)



Update the Default Program

As of the .AV Framework 7.01 release, the .AV Framework program is loaded to Crestron Virtual Control software by default. The program can be updated to the latest .AV Framework version from the VC-4 web configuration interface via the **Crestron Programs** accordion under the **Settings** tab.



Select **Update Now** to check Crestron servers for a newer .AV Framework version. If a new version is found, the default program will start updating immediately. A **Restart AV Framework rooms after upgrade** check box is also provided that, when selected, will restart all rooms running the default program following the upgrade.

To check for new .AV Framework versions automatically, turn on the **Auto Update** toggle, and then enter the **Day of Week** and **Time of Day** when the update request occur. Enter a **Poll Interval** (in hours) to set the polling interval for the update request.

Access the Configuration Utility

Configure settings for the .AV Framework room using the web-based configuration utility. The configuration utility for each .AV Framework room is accessible from the Crestron Virtual Control web interface.

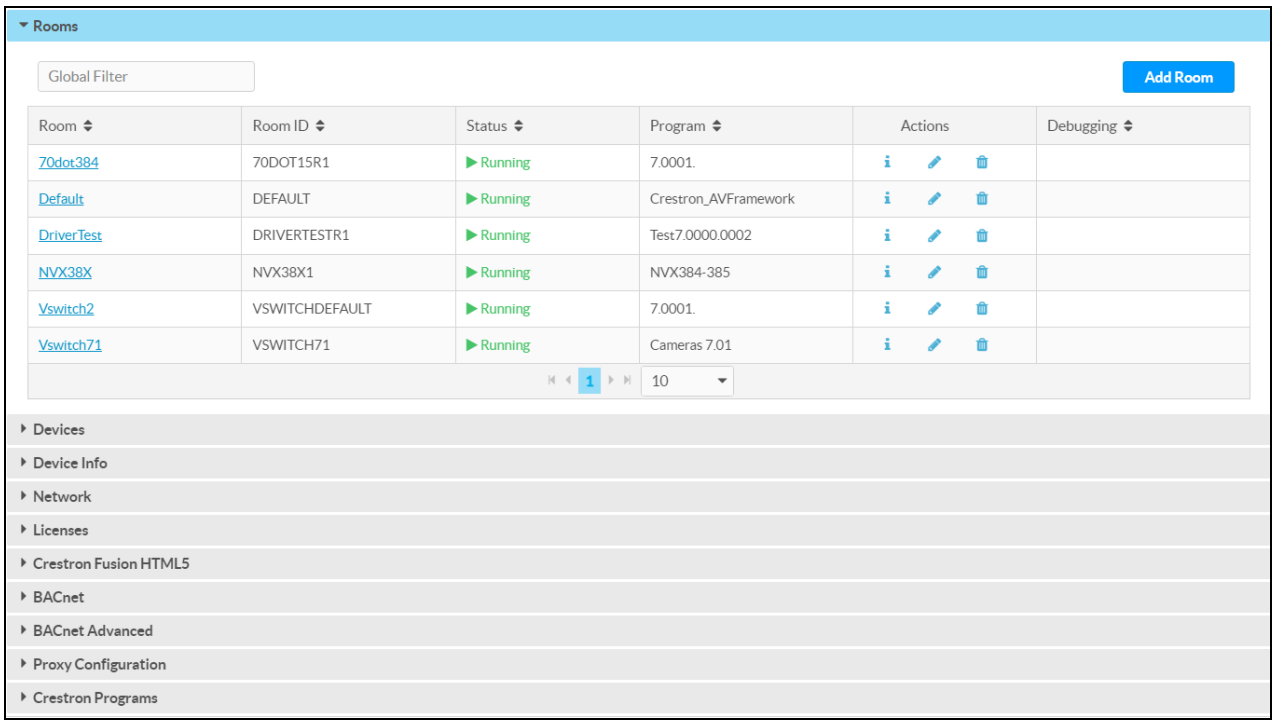
> **NOTE:** As of .AV Framework version 6.11, the VC-4 admin credentials are used to log in to .AV Framework, and all user management is handled through the VC-4.

To access the configuration utility for an .AV Framework room from the Crestron Virtual Control web interface:

> **NOTE:** Prior to accessing the configuration utility, ensure that all devices in the .AV Framework room have been updated to their latest firmware versions.

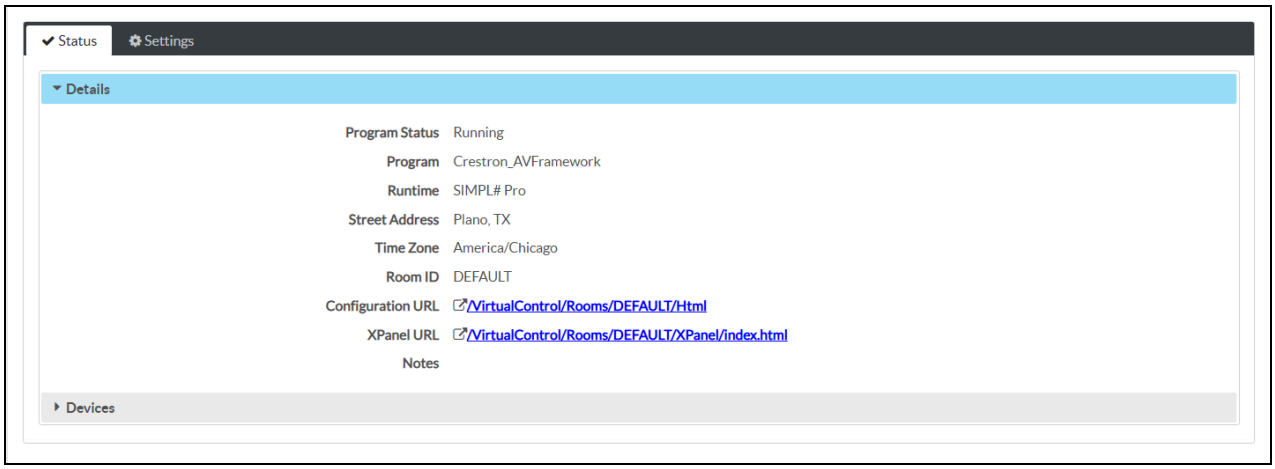
1. Select the **Status** tab.
2. Select the **Rooms** accordion (if it is not open already).

Status Tab - Rooms



3. Select the information button under the **Actions** column for the room that will be configured. The **Status** > **Details** page for the room is displayed.

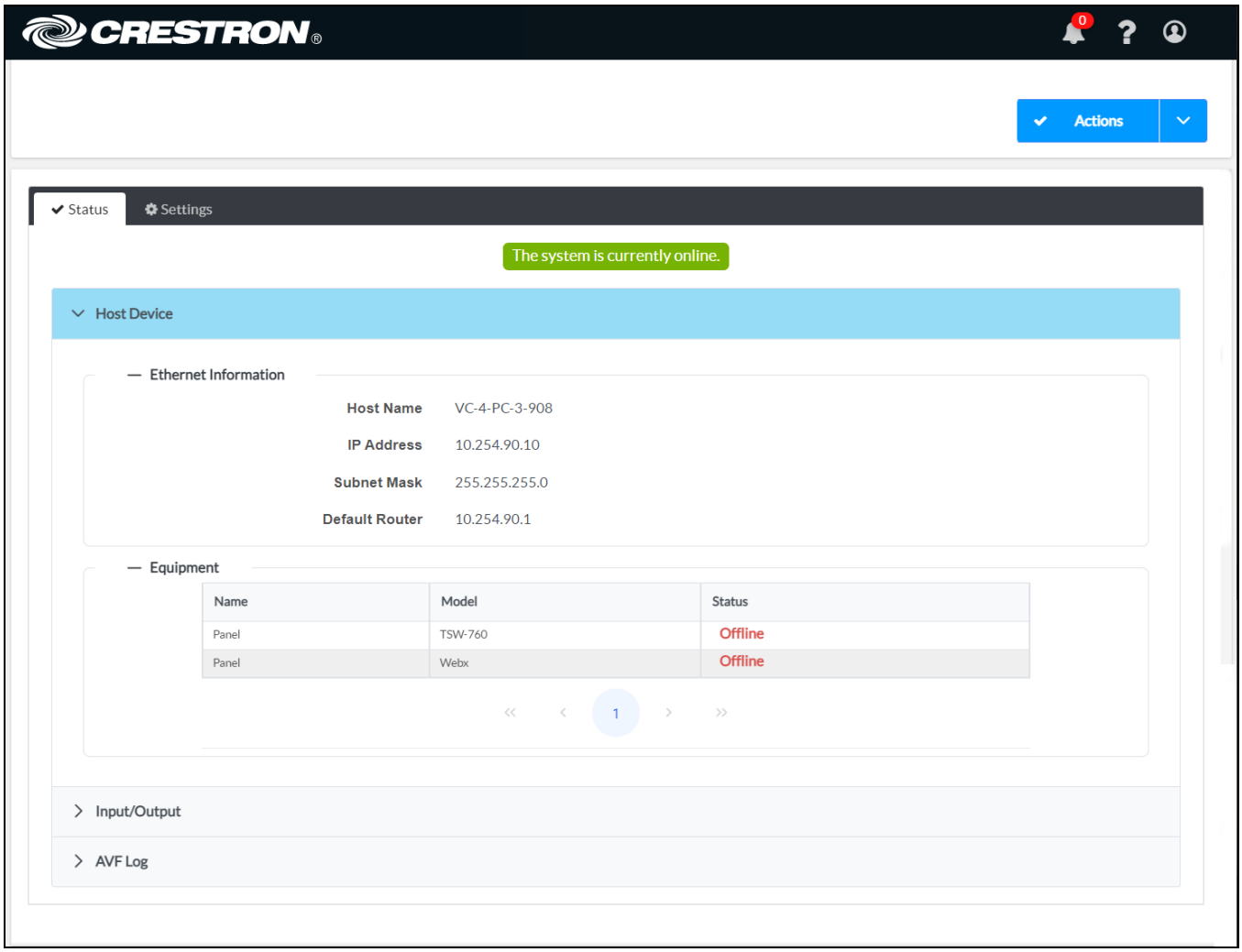
Status Tab - Details



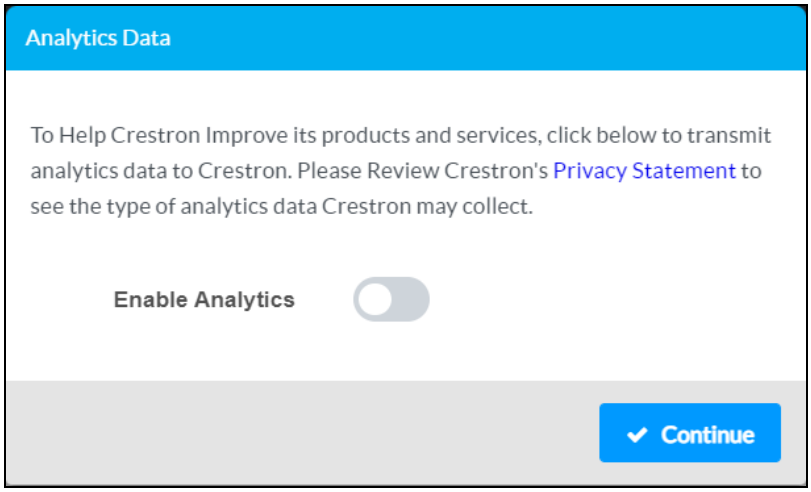
4. Select the link next to **Configuration URL**. The web configuration interface is displayed with the **Status** tab and **Host Device** accordion open by default.

NOTE: If logging into the .AV Framework system for the first time, a login page is displayed instead that asks for an authentication token. Enter the authentication token generated in Generate an Authentication Token on page 17, then select **Sign In**.

Web Configuration Interface Home Page



As of .AV Framework version 6.24, an **Analytics Data** dialog box is displayed following the initial login to a new system or following an upgrade to this version for existing systems.



The **Analytics Data** dialog box asks whether analytics data from your .AV Framework room can be sent to Crestron to help improve the user experience. Turn on the **Enable Analytics** toggle to allow analytics data to be sent to Crestron, or turn the toggle off (the default setting) to opt out of sending analytics data. Then, select **Continue** to proceed to the configuration utility. This setting can be changed any time using the **Privacy Settings** tab within the **System Settings** page of the configuration utility. For more information, refer to Privacy Settings on page 68.

Add an A/V Switcher

A compatible A/V switcher must be added to the .AV Framework room before any other devices can be added or edited. For a list of compatible switcher devices, refer to Product Features on page 4.

.AV Framework for Crestron Virtual Control supports the following types of A/V switchers:

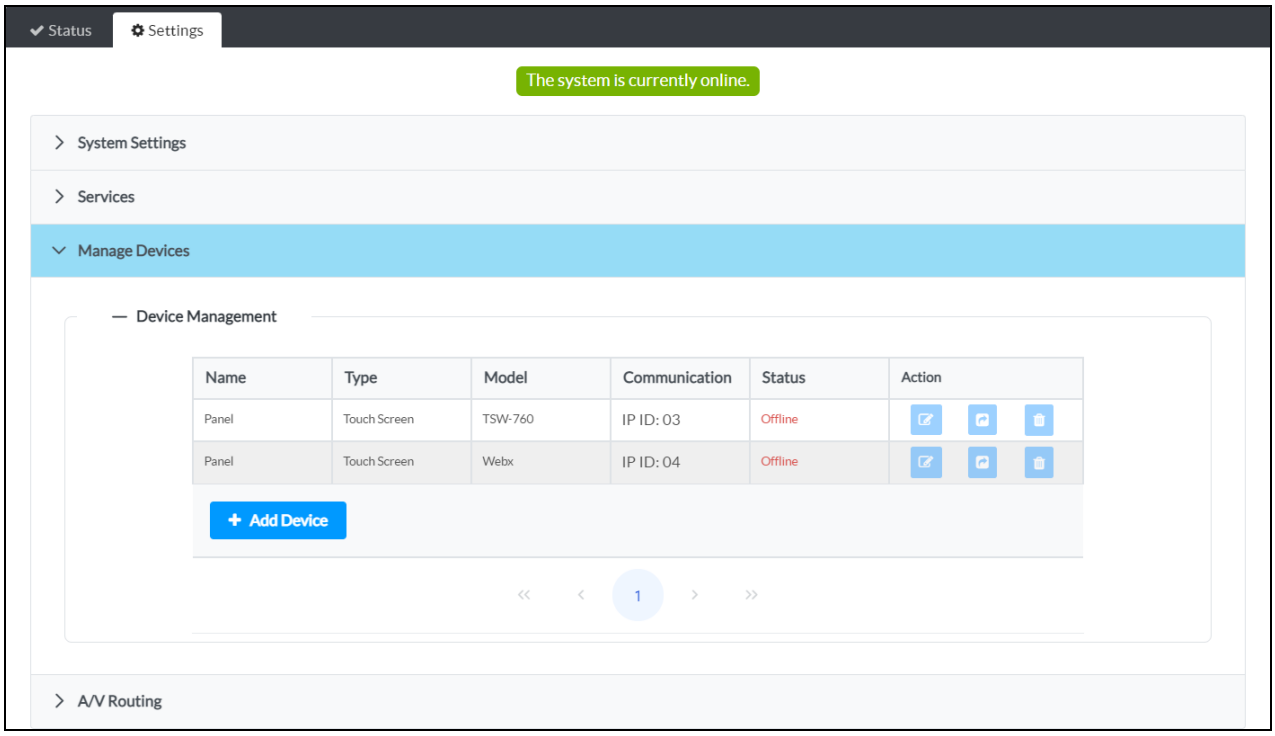
- Supported Crestron switcher devices
- Supported third-party switcher devices (via loaded device drivers)
- Supported Crestron DM NVX® encoders and decoders
- Supported Crestron DM switcher devices
- Virtual switchers (via supported flat panel displays or projectors)

> **NOTE:** Only one A/V switcher can be added per room.

To add an A/V switcher to the .AV Framework room:

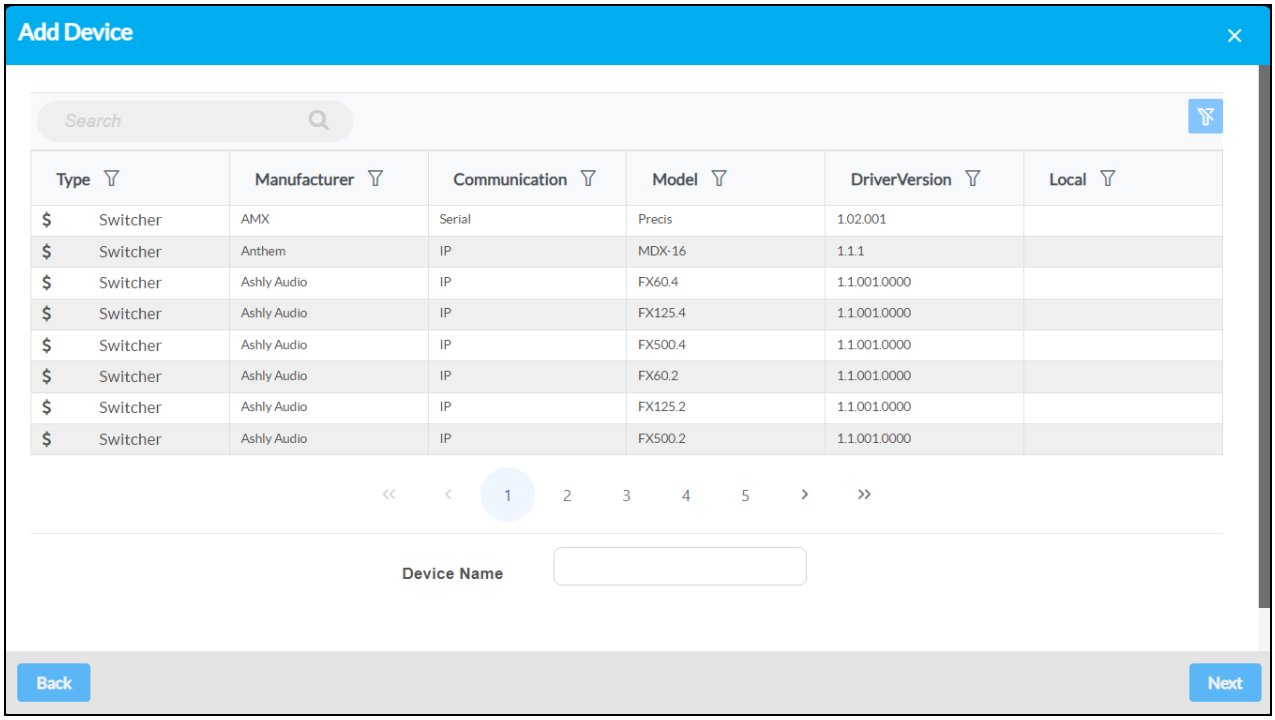
1. Select the **Settings** tab in the web configuration interface.
2. Expand the **Manage Devices** accordion to display settings for managing devices within the .AV Framework system.

Settings Tab - Manage Devices



3. Select **+ Add Device**. The **Add Device** dialog box is displayed.

Add Device Dialog Box



4. Navigate to and select the desired A/V switcher model in the provided table. For more information on adding devices, refer to Manage Devices on page 74.
   - Use the **Search** field to only display switchers matching the provided search term(s).
   - Use the controls at the bottom of the table to navigate through the available models.
   - Use the filter controls in each table header to filter the table data. Select the filter clear button to clear any filter data that is retained.
5. Enter a descriptive name for the A/V switcher in the **Device Name** text field.
6. Select **Next**. Additional information and settings (if applicable) for the A/V switcher are displayed.

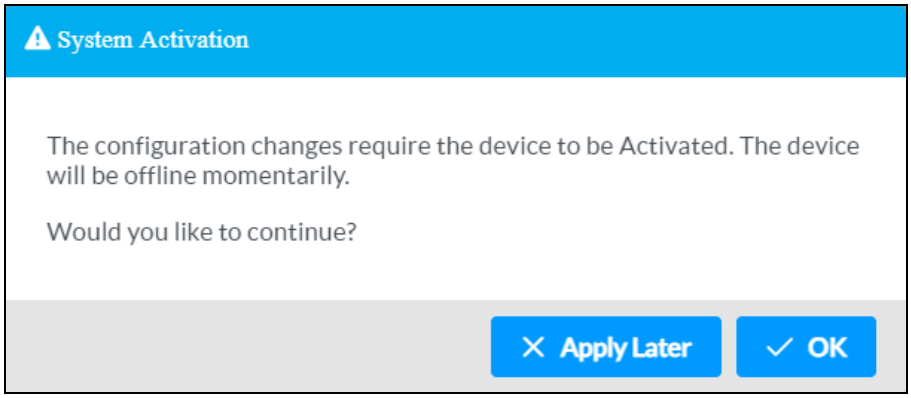
> **NOTE:** If a third-party switcher device was selected, its driver is imported from the cloud and installed into the .AV Framework system automatically.

7. For a Crestron or third-party switcher device, enter any required transport control information in the provided fields (such as **IP Address**, **IP ID**, or **Communications Port**).

> **NOTE:** Virtual switchers, DM NVX switchers, and DM switchers require additional setup procedures that are described later in this topic.

8. Select **Save**. A **System Activation** dialog box is displayed asking whether the room should be activated.

   System Activation Dialog Box



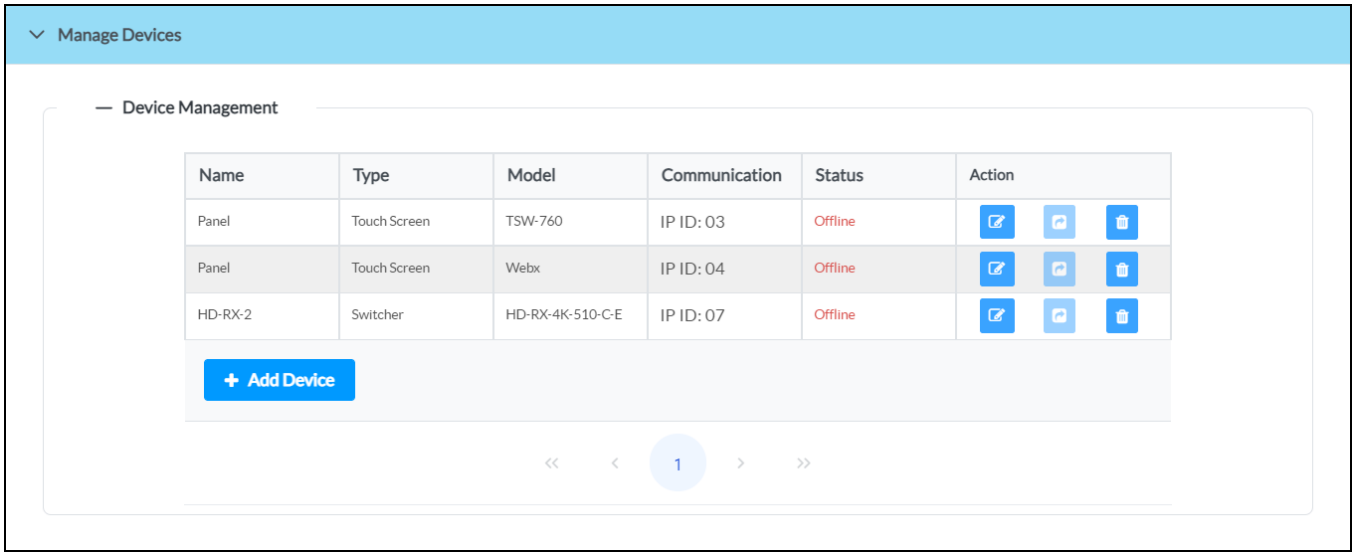
9. Select **OK**. The room goes offline to begin the activation process.

NOTE: When using a HD-RX-4K-210-C-E/-POE switcher, a DM Lite or DM Essentials transmitter must be configured and added as an endpoint to the switcher. The following DM Lite and DM Essentials transmitters are supported for this application:

- HD-TX-101-C-1G-E
- HD-TXC-101-C-1G-E-B-T (COM and IR not supported)
- HD-TX-201-C-2G-E
- HD-TX-301-C-E
- HDI-TX-301-C-2G-E
- HD-TX-101-C-E
- HD-TXC-101-C-E (COM and IR not supported)

Once the room is back online, the A/V switcher is added to the list of devices on the **Device Management** page. Other devices may now be added to the room.

Device Management Page (Device Added)



Virtual Switchers

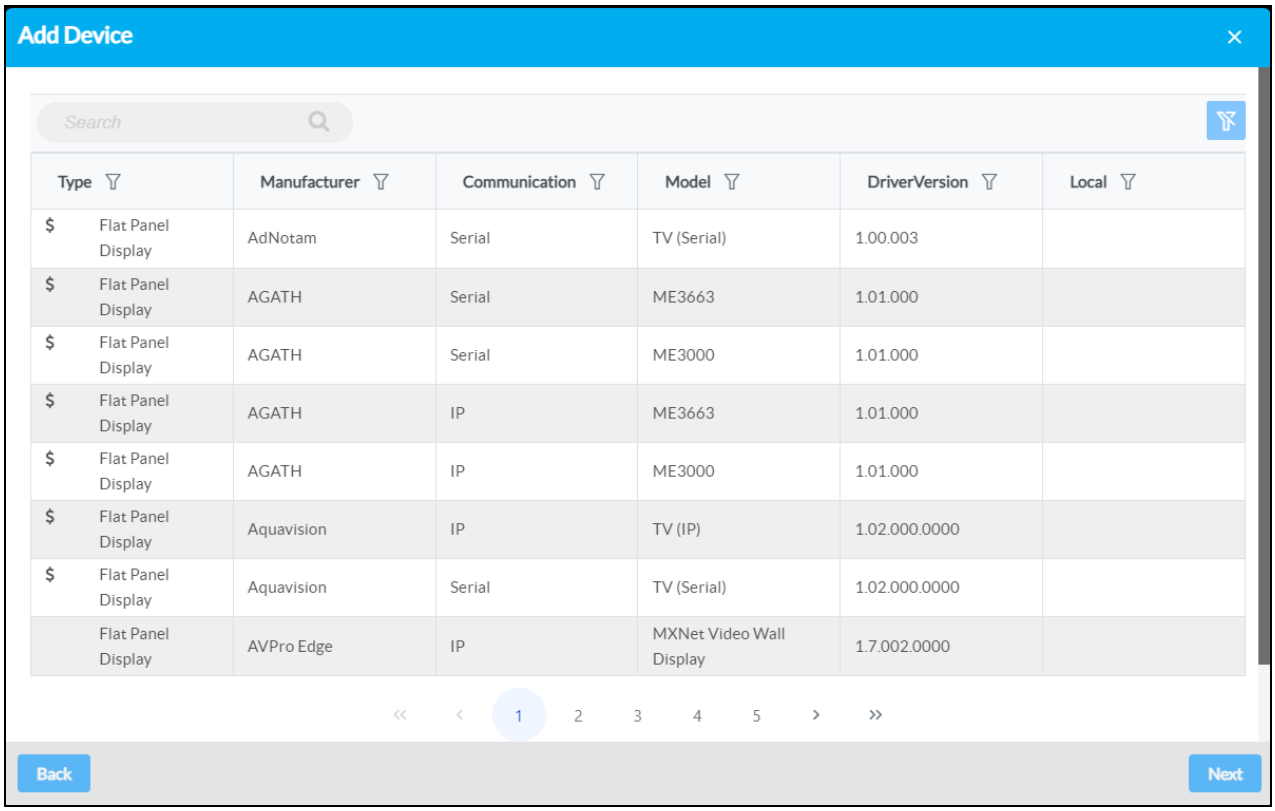
If **Crestron Virtual Switcher** was selected, a supported virtual switcher device (flat panel display or projector) must be added to the room before any other device can be added.

The .AV Framework virtual switcher uses the input and output ports on the selected virtual switcher device to route its sources.

To add a virtual switcher device to the room:

1. Select **Add Device**. The **Add Device** dialog box is displayed.

   Add Device Dialog Box

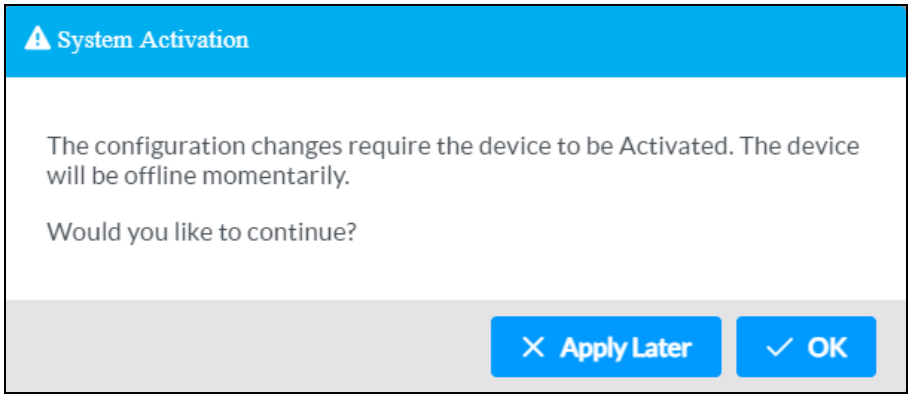


2. Navigate to and select the desired virtual switcher device in the provided table. For more information on adding devices, refer to Manage Devices on page 74.
   - Use the **Search** field to only display devices matching the provided search term(s).
   - Use the controls at the bottom of the table to navigate through the available models.
   - Use the filter controls in each table header to filter the table data. Select the filter clear button to clear any filter data that is retained.
3. Enter a descriptive name for the virtual switcher device in the **Device Name** text field.
4. Select **Next**. Additional information and settings for the virtual switcher device are displayed.

> **NOTE:** The virtual switcher device driver is imported from the cloud and installed into the .AV Framework system automatically.

5. Enter any transport control, warm up/cool down, authentication, or other settings required for the device. For more information, refer to Manage Devices on page 74.
6. Select **Save**. A **System Activation** dialog box is displayed asking whether the room should be activated.

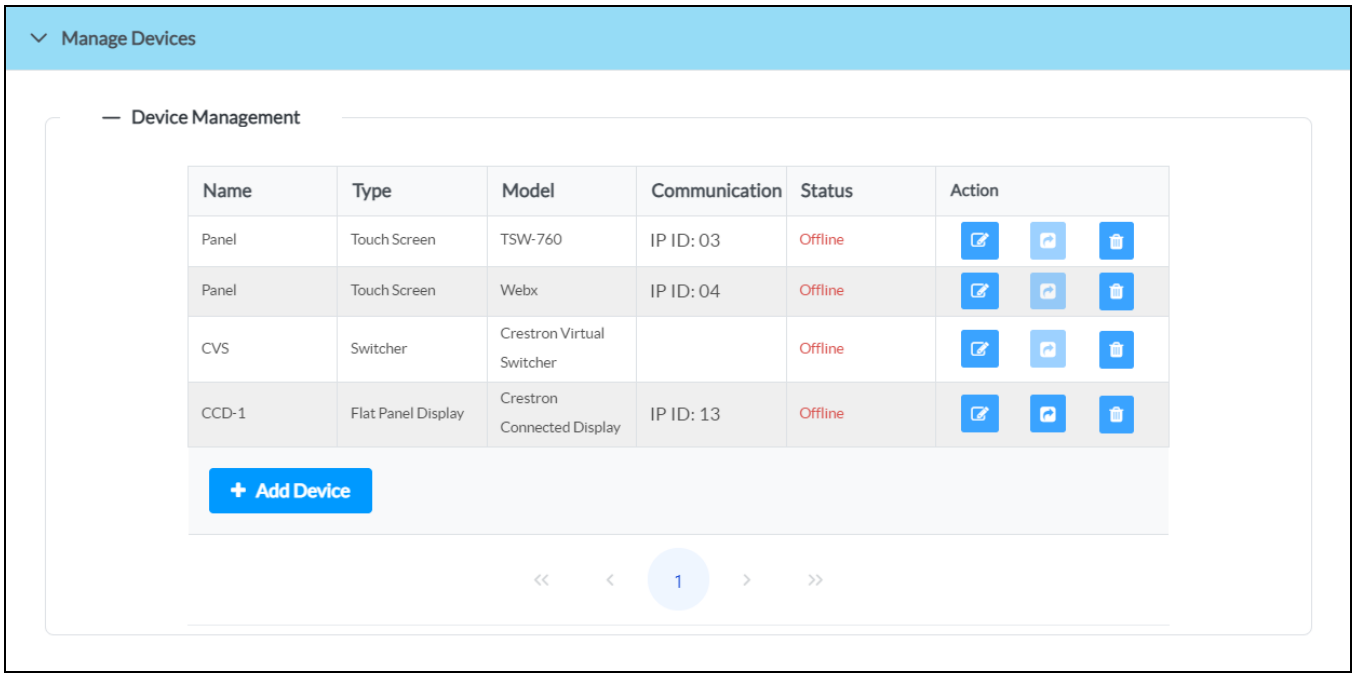
   System Activation Dialog Box



7. Select **OK**. The room goes offline to begin the activation process.

Once the room is back online, the virtual switcher device is added to the list of devices on the **Device Management** page. Other devices can now be added to the room.

Manage Devices Accordion (Virtual Switcher Added)



NOTE: Drivers for flat panel displays and projectors are generic, and the device inputs provided in .AV Framework may not match the physical inputs on the device. If an unsupported input is selected in the touch screen user interface, the route may not be completed. Therefore, all unsupported inputs should be turned off on the **Inputs/Outputs** page. For more information, refer to A/V Routing on page 84.

DM NVX Switchers

If **DM NVX** was selected, DM NVX devices should be configured as transmitter and receiver endpoints before any other device is added. For a list of compatible DM NVX devices, refer to Product Features on page 4.

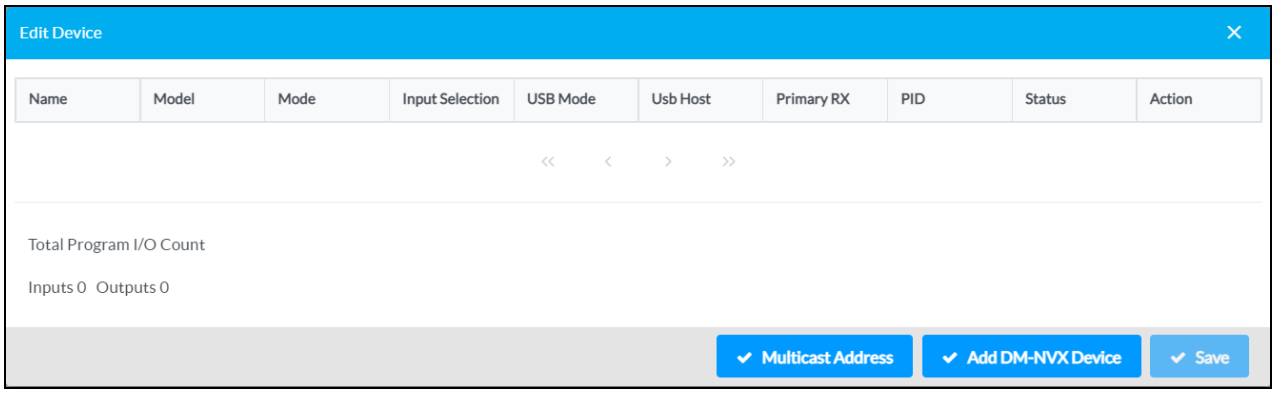
DM NVX encoder and decoder devices can function as A/V switchers over IP within an .AV Framework room. Up to ten DM NVX devices can be set as transmitters and paired with up to eight DM NVX devices set as receivers, allowing for independent routing of all inputs (whether in transmitter or receiver mode) and support for breakaway audio on transmitters. Automatic endpoint configuration and commissioning via multicast addressing is also supported. Additionally, DM NUX devices can be added for USB signal routing within the .AV Framework room.

> **NOTE:** In order for .AV Framework to support analog audio, the **Analog Audio Mode** for the DM NVX receiver must be set to **Extract**, and the **Analog Audio Mode** for the DM NVX transmitter must be set to **Insert**. A cable must not be connected to the analog port if this mode is being changed. For more information, refer to the appropriate DM NVX AV-over-IP Distribution Platform Product Manual.

To configure DM NVX devices as transmitters and receivers:

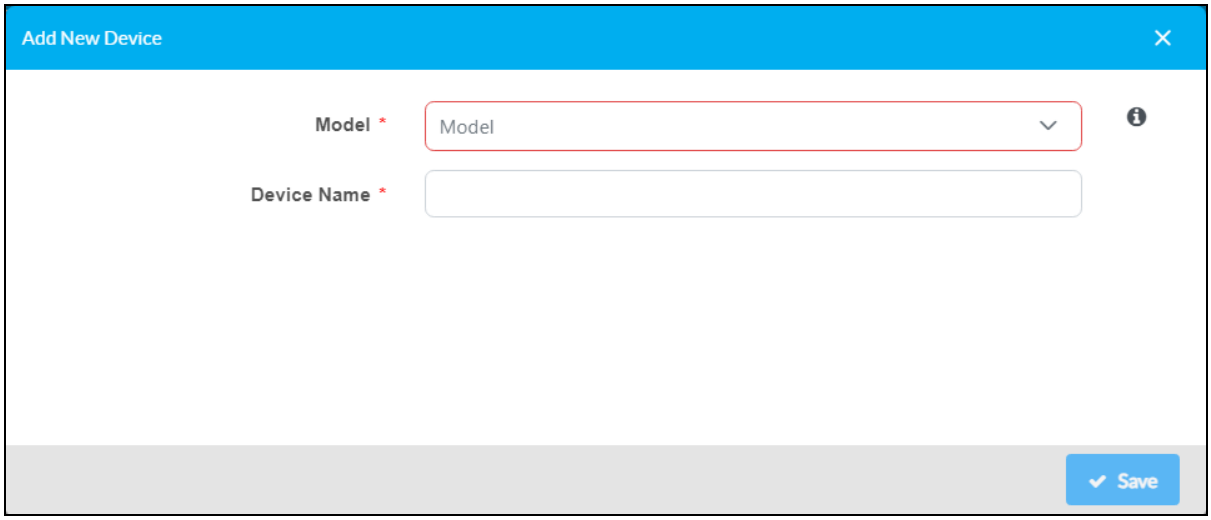
1. Select the edit button to the right of the **DM-NVX** entry in the **Device Management** table. An **Edit Device** dialog box is displayed.

   Edit Device Dialog Box (DM NVX)



2. Select **Add DM-NVX Device**. An **Add New Device** dialog box is displayed.

Add New Device Dialog Box



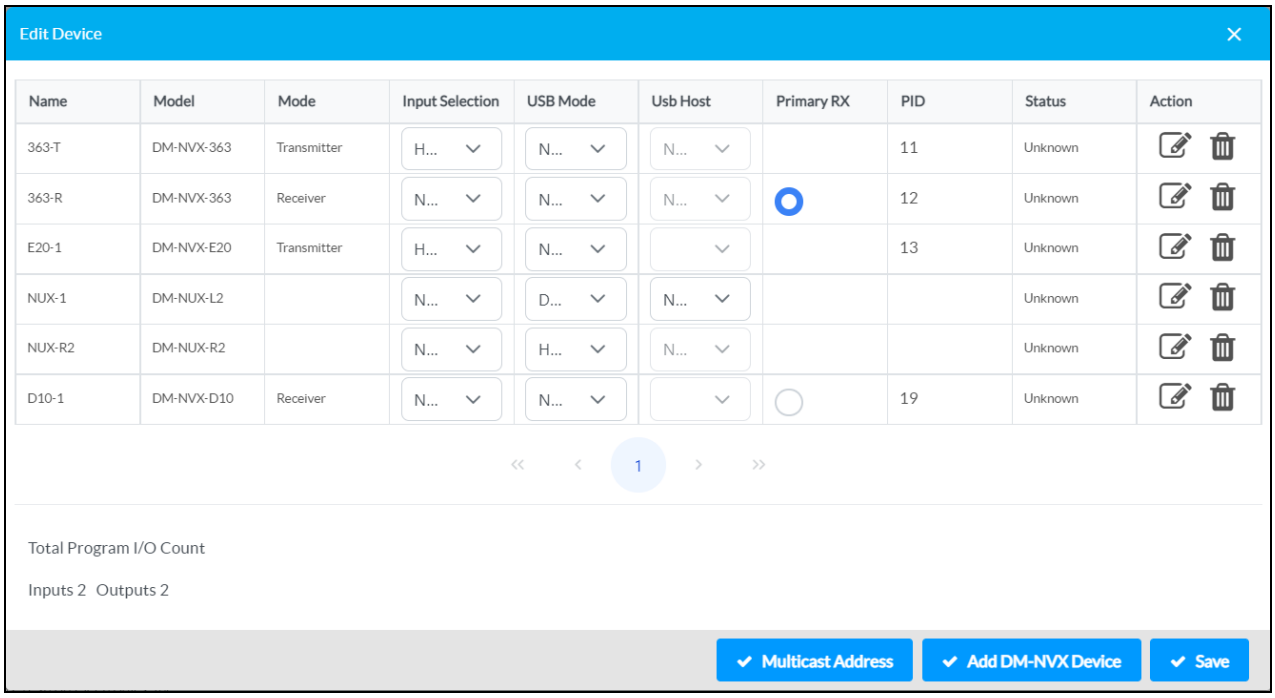
3. Enter the following information for the DM NVX or DM NUX device:
   a. Select the device model from the **Model** drop-down menu.
   b. Enter a descriptive name for the device in the **Device Name** text field.
   c. If a DM NVX device model was selected for **Model**, enter the IP ID used to connect to the device in the **IP ID** text field.
   d. If a DM NUX device model was selected for **Model**, enter the MAC address of the device in the **MAC** text field.

      > **NOTE:** Since DM NUX devices use their MAC address for communication, they can only pair with DM NVX or DM NUX devices that are located on the same subnet. MAC address communication does not cross subnets.

   e. Use the drop-down menu to select whether the device will function as a **Transmitter** or a **Receiver**.
4. Select **Save**. The DM NVX or DM NUX device is added to the room.
5. Repeat steps 2–4 to add additional DM NVX and DM NUX devices to the room. At least one receiver must be added to the room.

> **NOTE:** Up to ten DM NVX devices can be added as HDMI transmitters or receivers before the configuration is deemed invalid and the **Save** button is grayed out. However, if more than one input is selected for a device using the **Input Selection** drop-down menu, this further limits the number of DM NVX devices that can be added. For example, if two input sources are defined on a transmitter, only five DM NVX devices can be added.

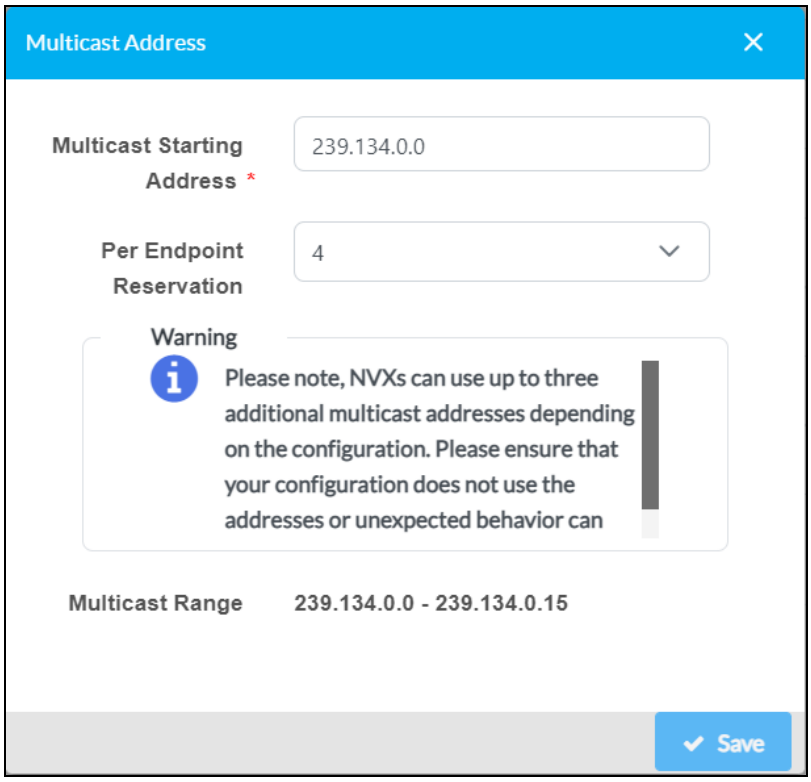
Edit Device Dialog Box (DM NVX) - With Devices Added



6. If using a custom multicast address to commission DM NVX endpoints automatically, select **Multicast Address**. A **Multicast Address** dialog box is displayed.

> **NOTE:** For more information on configuring multicast addressing for DM NVX devices, refer to the DM NVX AV-over-IP Distribution Platform Product Manual.

Multicast Address Dialog Box



7. Enter the following information for multicast addressing:
   a. Enter a valid multicast address into the **Multicast Starting Address** text field. The multicast address must be within the range shown next to **Multicast Range**.

      > **NOTE:** A warning stating that unexpected behavior may occur is displayed if the user-provided multicast starting address is within a range that conflicts with common multicast addresses.

   b. Use the **Per Endpoint Reservation** drop-down menu to select the number of multicast addresses that will be reserved per endpoint.
8. Select **Save**.
9. Use the **Input Selection** drop-down menu to set the default input selection for each transmitter or receiver (**Auto** (transmitters only), **None** (receivers only), **HDMI1**, **HDMI2**, or **HDMI1 and HDMI2**).
10. Use the **USB Mode** drop-down menu to set the USB routing behavior for the DM NVX or DM NUX device:
    - Select **Host** to have the DM NVX or DM NUX-R2 device act as a surrogate USB host (such as a PC or another host device).
    - Select **Device** to have the DM NVX or DM NUX-L2 device act as a surrogate USB device (such as a USB mouse, keyboard, or other peripheral device).
    - Select **None** if the DM NVX or DM NUX device will not use USB routing.

> **NOTE:** The .AV Framework room must be powered on to use USB routing. For more information on USB routing using DM NVX and DM NUX devices, refer to the "USB 2.0 Routing" topic in the DM NVX AV-over-IP Distribution Platform Product Manual.

11. If **Device** is selected for **USB Mode**, use the **USB Host** drop-down menu to select the desired routing behavior between the USB device and host.
    - To use fixed routing, select an available transmitter or receiver to act as a USB host. A fixed USB route will be established between the two DM NVX or DM NUX devices.
    - To use follows routing, select **Follow Route**. The USB signal will be routed to the DM NVX transmitter from a receiver (USB host) in the system that is configured for manual USB routing.

      > **NOTE: Follow Route** can be selected only for DM NVX transmitters. DM NUX devices cannot be used in follows routes.

12. If more than one receiver has been added to the room, use the **Primary RX** column to select the primary receiver for the room.
13. Select **Save** in the **Edit Device** dialog box to save the configuration.

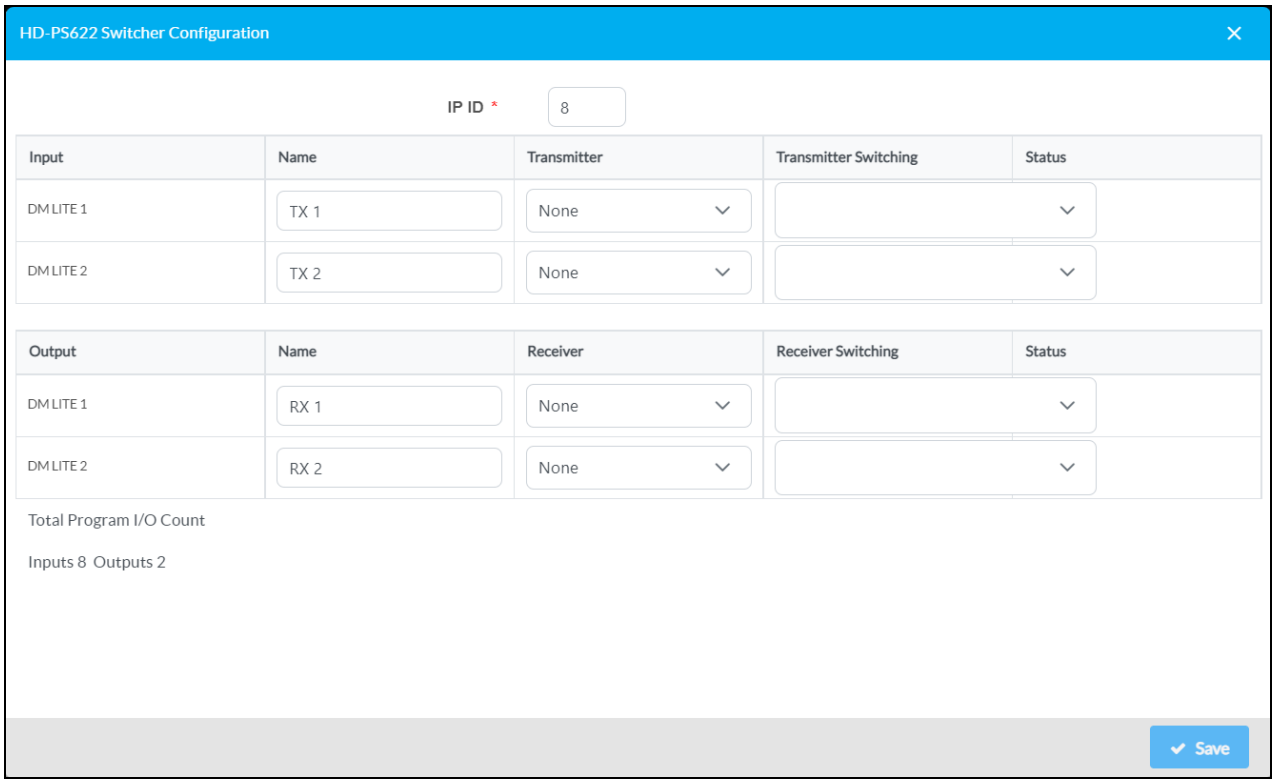
DM Switchers

Certain switchers (such as the HD-PS series and HD-RX-4K-210-C-E) can use supported DM® Essentials, DM Lite®, and DM-RMC endpoint transmitter and receiver devices to route audio and video sources over IP within an .AV Framework system. Transmitters can be paired with receivers through the switcher, allowing for independent routing of all inputs. The number of supported transmitters and receivers is based on the number of DM Lite inputs and outputs, respectively, on the switcher. For a list of compatible DM Lite, DM Essentials, and DM-RMC devices, refer to the Works with .AV Framework Reference Guide.

To configure transmitter and receiver endpoints for a DM switcher:

1. Select the pencil button to the right of the DM switcher entry in the **Device Management** table. A **Switcher Configuration** dialog box is displayed.

   Switcher Configuration Dialog Box



2. Enter the following information for the endpoint transmitter device(s) (if applicable):
   a. Enter a descriptive name for the endpoint transmitter input in the **Name** text field.
   b. Select the applicable DM switcher device model from the **Transmitter** drop-down menu.
   c. Select a switching mode from the **Transmitter Switching** drop-down menu:
      - Select **Auto** to have the switcher device route audio and video signals from the transmitter automatically.
      - Select one or more input names to have the switcher device route audio and video signals only from these inputs. The provided inputs are based on the physical inputs on the selected endpoint transmitter.
      - Select **None** to turn off audio and video routing for the endpoint transmitter.

      NOTE: If **Auto** and one or more inputs are selected together, the configuration is deemed invalid and the **Save** button is grayed out until these are decoupled. Additionally, if more than 10 inputs are defined within the entire system, the configuration is deemed invalid until 10 or fewer inputs are defined.

3. Enter the following information for the endpoint receiver device(s) (if applicable):
    a. Enter a descriptive name for the endpoint transmitter output in the **Name** text field.
    b. Select the applicable DM Lite, DM Essentials, or DM-RMC device model from the **Receiver** drop-down menu.

    > **NOTES:**
    >
    > - For **DM LITE** outputs, select **None** to enable HDBaseT® communications for that output on the DM Lite switcher. This allows serial display and projector devices to connect to the .AV Framework system over HDBaseT. When **None** is selected for a **DM LITE** output, an **HDBaseT_x_Serial** option becomes available in the **Communications Port** drop-down menu for serial display and projector devices, where **x** is the **DM LITE** output port.
    > - Supported DM-RMC devices will not appear in the **Receiver** drop-down menu until they have been added and configured for the .AV Framework room.

4. Select **Save**. The inputs and outputs from the selected transmitter and receiver devices appear within the A/V Routing table for source routing. For more information, refer to A/V Routing on page 84.

Add New Devices

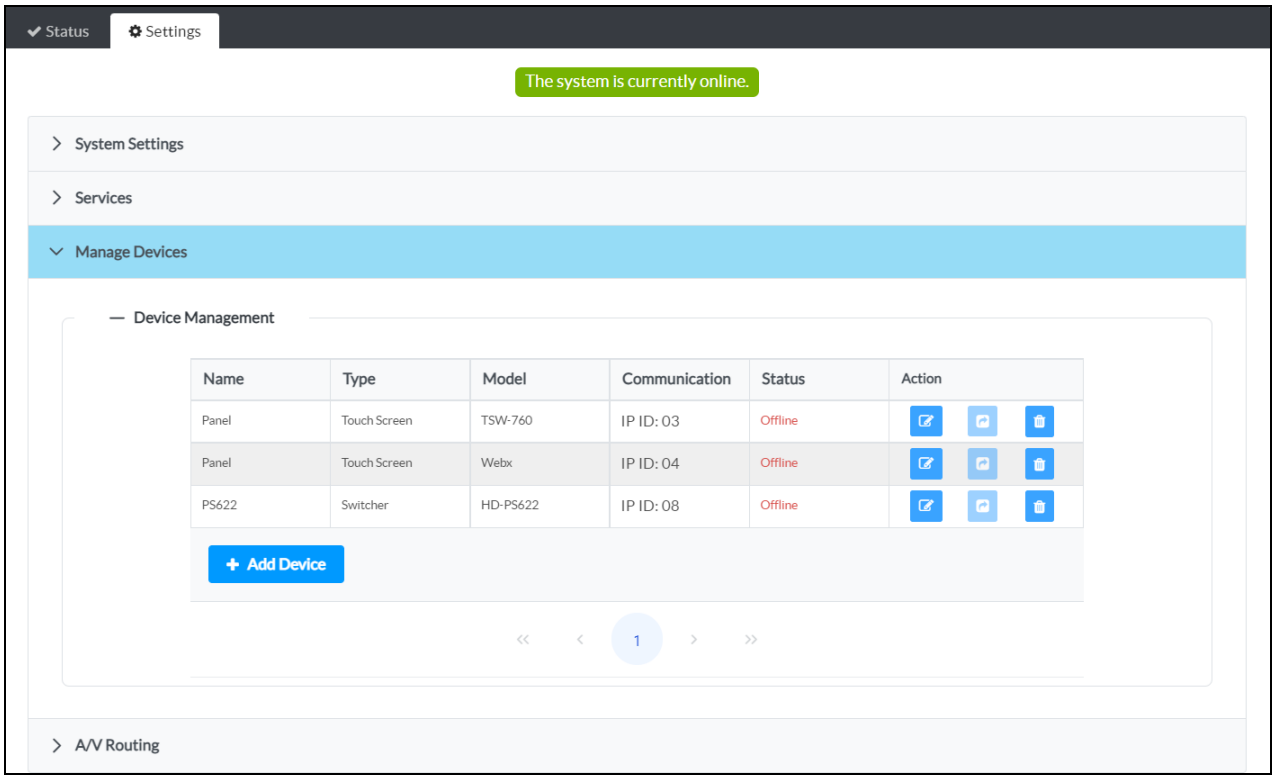
After adding an A/V switcher to the .AV Framework room, additional devices can be added to the room via wired and wireless connections to the A/V switcher and to the server. For more information, refer to Appendix A: Interface Setup on page 117.

> **NOTE:** All devices must be connected to the A/V switcher or accessible on the network prior to adding them to the room.

To add devices to the .AV Framework system:

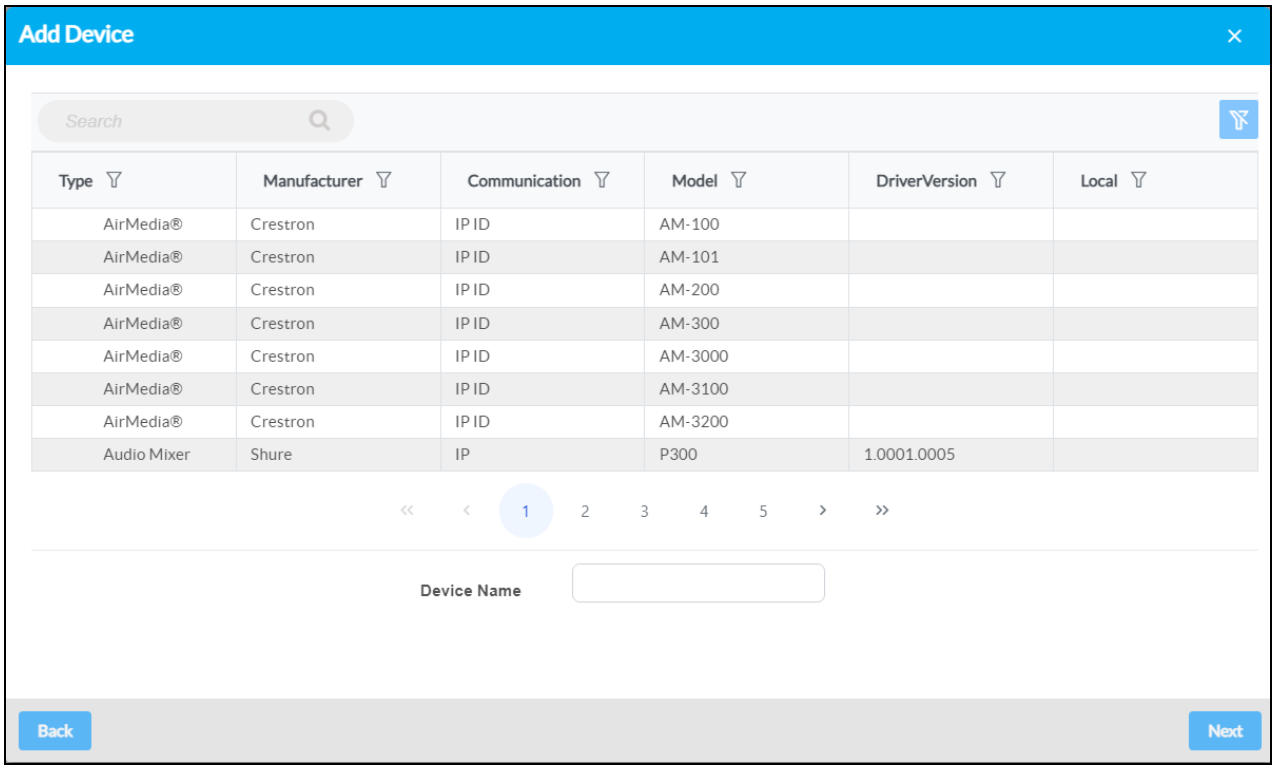
1. Select the **Settings** tab in the web configuration interface.
2. Expand the **Manage Devices** accordion to display settings for managing devices within the .AV Framework system.

Device Management Page



3. Select **+ Add Device**. The **Add Device** dialog box is displayed.

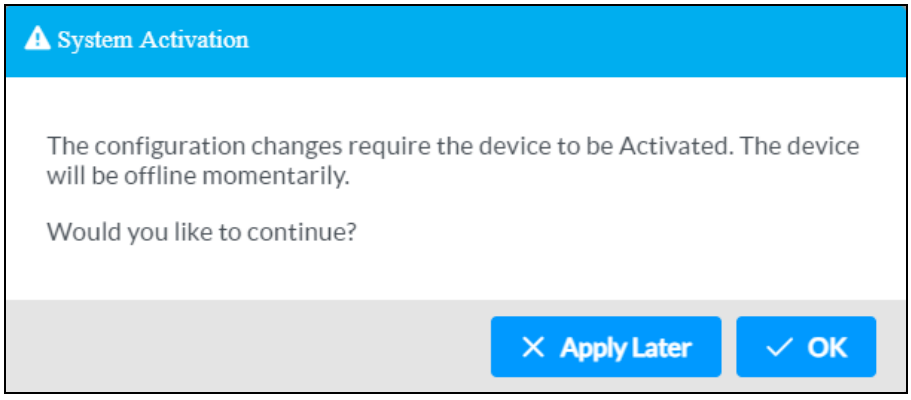
Add Device Dialog Box



4. Navigate to and select the desired device model in the provided table. For more information on adding devices, refer to Manage Devices on page 74.
    - Use the **Search** field to only display devices matching the provided search term(s).
    - Use the controls at the bottom of the table to navigate through the available models.
    - Use the filter controls in each table header to filter the table data. Select the filter clear button to clear any filter data that is retained.
5. Enter a descriptive name for the device in the **Device Name** text field.
6. Select **Next**. Additional information and settings (if applicable) for the device are displayed.

    NOTE: If a third-party device was selected, its driver is imported from the cloud and installed into the .AV Framework system automatically.

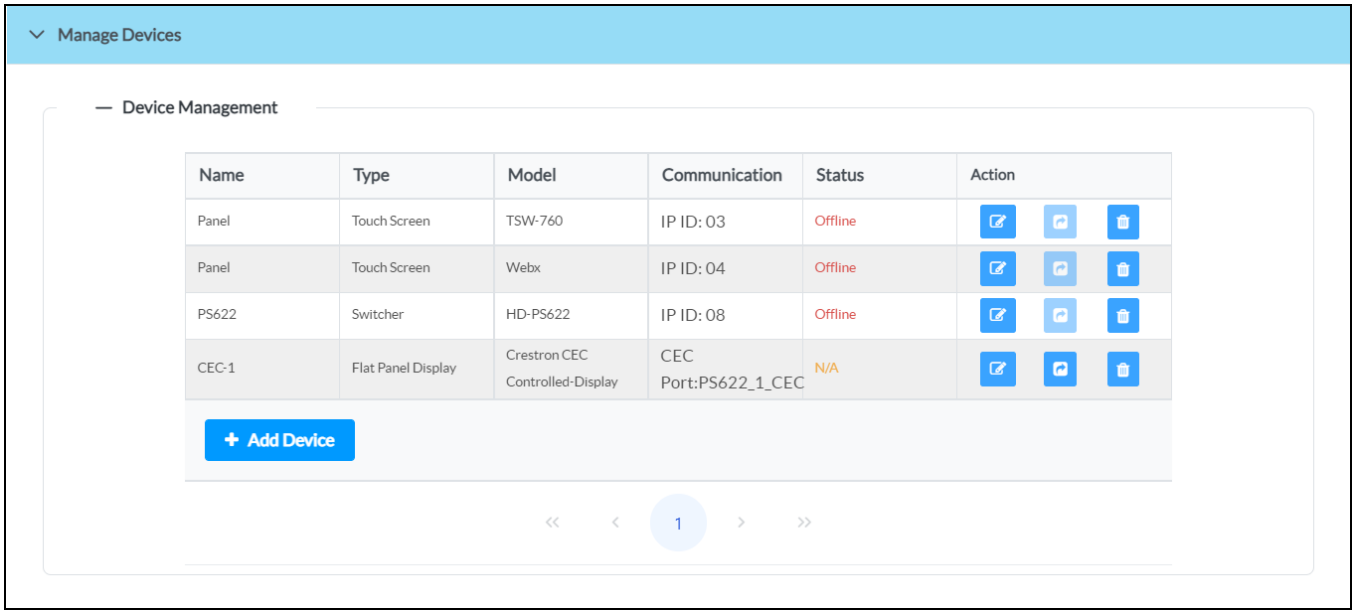
7. Enter any additional settings for the device in the appropriate fields (if required), including the transport control details. For more information, refer to Manage Devices on page 74.
8. Select **Save**. If required by the device, a **System Activation** dialog box is displayed asking whether the room should be activated.



9. Select **OK**. The room goes offline to begin the activation process.

The device is added to the list of devices on the **Manage Devices** accordion.

Device Management Page (Device Added)

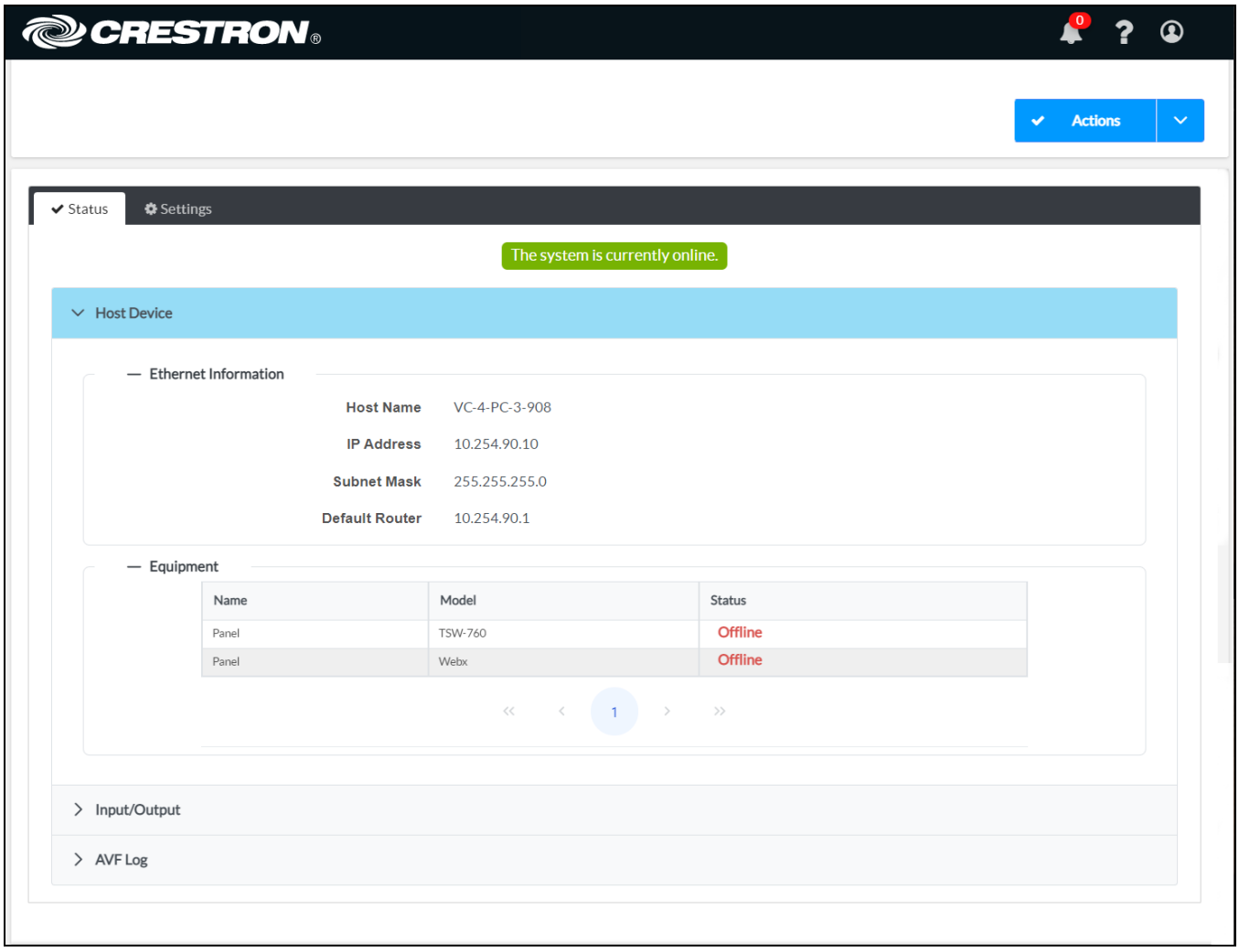


Configuration

The .AV Framework room can be monitored and configured using its web configuration interface. Use the web configuration interface to configure system settings, to add devices and an A/V switcher to the .AV Framework room, to configure the inputs and outputs of the A/V switcher, and to manage saved configurations. The web configuration interface also provides pages that display the system status and an activity log.

The interface can be accessed via the Crestron Virtual Control web configuration interface as described in Access the Configuration Utility on page 19.

Web Configuration Interface



The web configuration interface provides the following tabs and menus for navigating the interface.

- **Status**: Select this tab to monitor the status of the .AV Framework system and its connected devices. For more information, refer to Status on page 48.

- **Settings**: Select this tab to configure .AV Framework system settings, including managing devices and configuring inputs/outputs. For more information, refer to Settings on page 54.
- **Actions**: Use this drop-down menu to download or upload a system configuration, manage device drivers, and activate an unsaved configuration. For more information, refer to Actions Menu on page 41.

The **Status** tab is shown by default with the **Host Device** accordion open.

> **NOTE:** As of .AV Framework version 6.11, user management settings have been depreciated. User management is handled through the device, and any users created within .AV Framework are removed from the system after upgrading to the latest release. For more information on configuring users on the device, refer to the Crestron Virtual Control Product Manual.

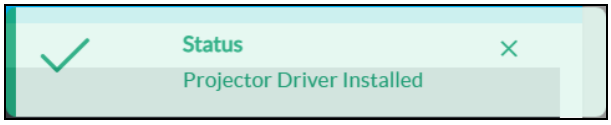
The following informational controls are also provided on the top right of the web configuration interface:

- Select the help button to access this documentation from within the web configuration utility.
- Select the alerts button to view any active alerts for the .AV Framework system. For more information, refer to Alerts on page 40.
- Select the profile button to display controls for signing out of the web configuration utility.

Alerts

As of .AV Framework version 6.19, certain pop-up notifications have been replaced by toast notifications that are displayed at the top right of the page.

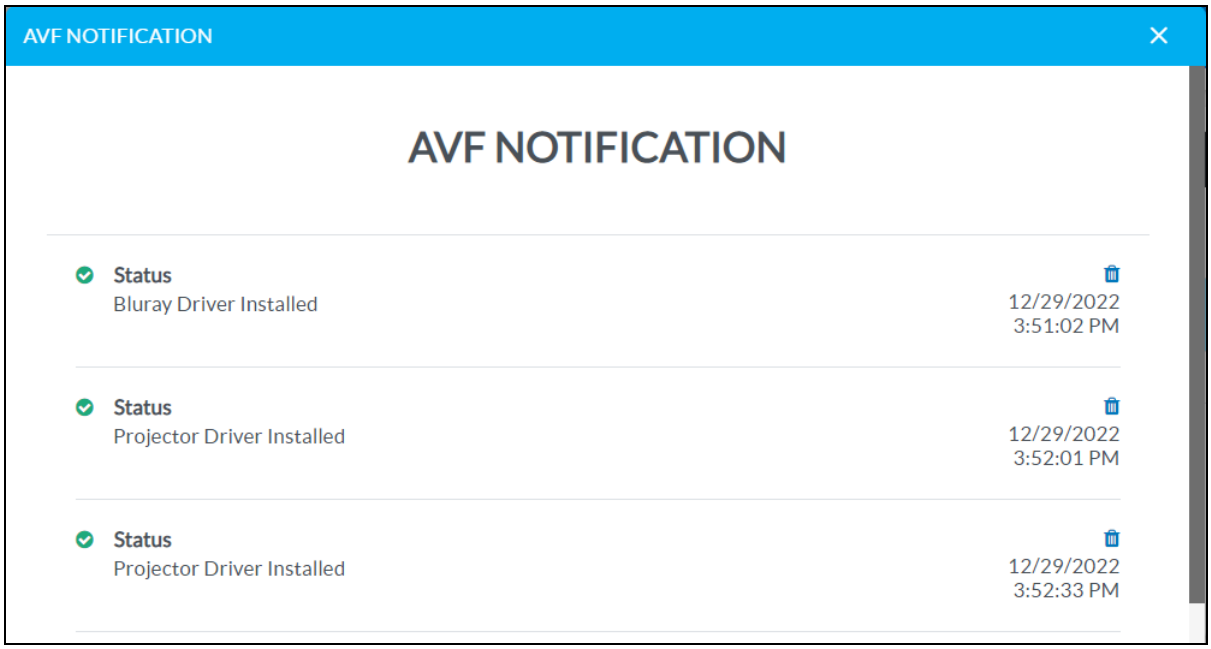
Toast Notification in .AV Framework Web Configuration UI



After a toast notification disappears, its associated alert is retained in an alert log, and the number within the alerts button updates to show how many alerts are currently logged.

Select the alerts button to view all active alerts for the .AV Framework system. The **AVF Notification** dialog box is displayed.

AVF Notification Dialog Box



Alerts are ordered by time and date, starting with the most recent alert. Each alert provides a title, a brief description, and the date and time that the alert occurred.

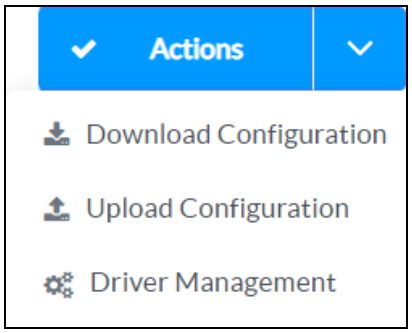
To clear an alert, select the trash can button to the right of the alert. Once an alert is cleared, it no longer is displayed in the **AVF Notification** dialog box, and the number within the alert button updates accordingly.

Select the **x** button to close the **AVF Notification** dialog box.

Actions Menu

The configuration interface provides an **Actions** drop-down menu on the top right of the page. The **Actions** menu may be accessed at any time.

Actions Menu



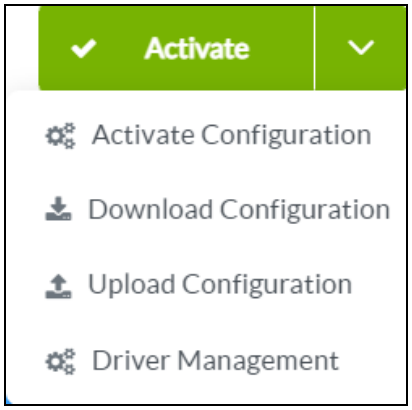
After any changes have been made that require a setting to be saved, the **Actions** button changes to a **Save Changes** button. Select **Save Changes** to save the setting without placing the .AV Framework system offline.

Actions Menu - Save Changes Button



After any changes have been made to the .AV Framework system that require the system to go offline, the **Actions** button changes to an **Activate** button. Select **Activate** (or select **Activate Configuration** from the drop-down menu) to activate any saved changes and place the .AV Framework system offline.

Actions Menu - Activate Button



The **Actions** menu provides the following selections.

Activate Configuration

If changes have been made to the .AV Framework system that require the system to go offline, select **Activate Configuration** to activate the system.

Download Configuration

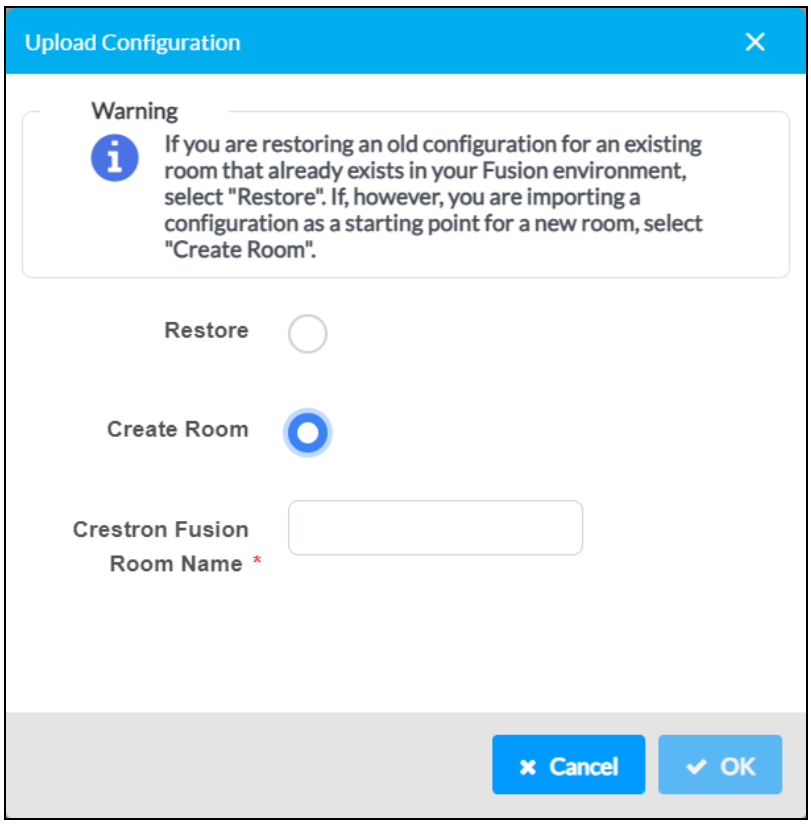
Select **Download Configuration** to download the current configuration settings as a .zip file. The downloaded .zip file includes XML files that contain the current configuration settings and any device driver files that are loaded in .AV Framework.

Upload Configuration

Select **Upload Configuration** to upload saved configuration files to the configuration utility. Saved configuration files can be used to configure similar rooms by uploading the configuration files to the corresponding .AV Framework systems.

An **Upload Configuration** dialog box is displayed.

Upload Configuration Dialog Box



The **Upload Configuration** dialog box provides options for modifying the Crestron Fusion room information that is paired with the configuration:

- Select the **Restore** radio button to restore the Crestron Fusion room settings that exist in the configuration files.
- Select the **Create Room** radio button to create a new Crestron Fusion room using the imported configuration settings. Enter the room name in the **Crestron Fusion Room Name** text field that is displayed.

Select **OK** to import the configuration files with the selected Crestron Fusion room settings or select **Cancel** to cancel the import. Select the **x** button to close the **Upload Configuration** dialog box.

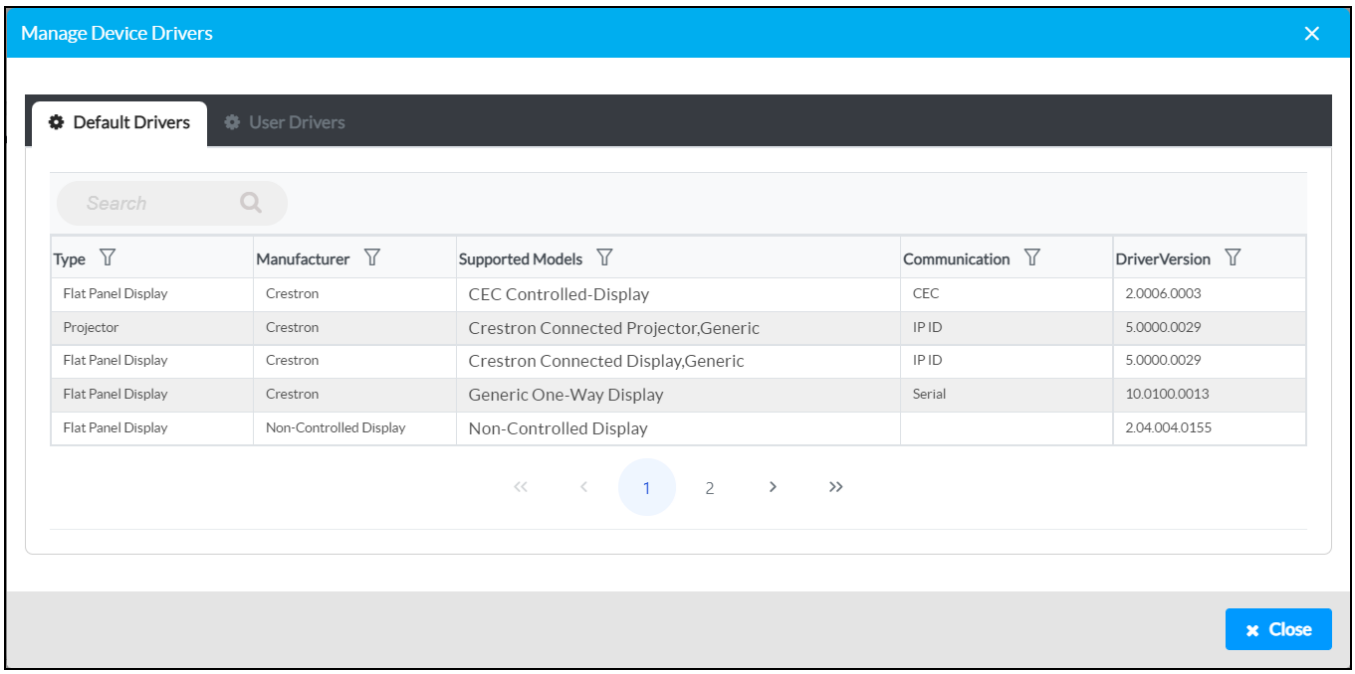
Driver Management

Select **Driver Management** to manage existing device drivers and to add new device drivers manually to .AV Framework.

> **NOTE:** As of .AV Framework version 6.31, user drivers are imported from the cloud and installed automatically when the corresponding device model is selected while adding a new device. User drivers can still be loaded manually into .AV Framework from the **Manage Device Drivers** dialog box.

A **Manage Device Drivers** dialog box is displayed.

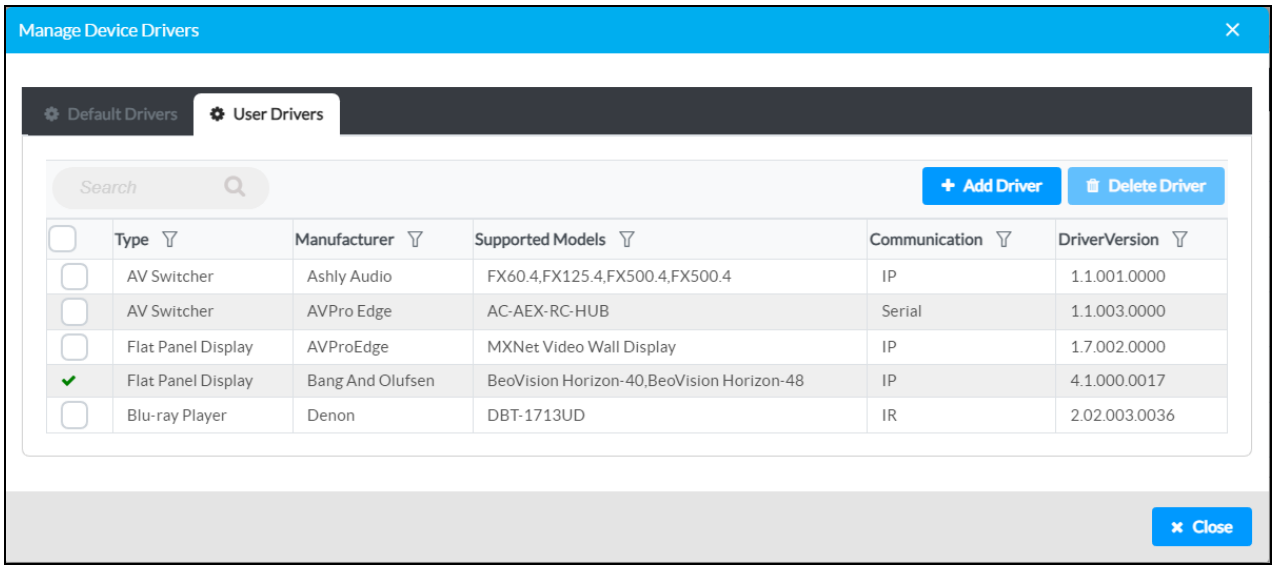
Manage Device Drivers Dialog Box



Use the **Manage Device Drivers** dialog box to manage existing device drivers and to add new device drivers manually to .AV Framework. The **Manage Device Drivers** dialog box is divided into two sections that can be accessed by selecting the appropriate tab at the top of the dialog.

- **Default Drivers**: Contains all generic drivers that are included and turned on within the .AV Framework system by default. These drivers cannot be deleted from the .AV Framework system. Refer to the previous image.
- **User Drivers**: Contains all custom drivers that are downloaded and installed by the user. These drivers can be deleted from the .AV Framework system if they are not actively being used in a system configuration. Refer to the following image.

Manage Device Drivers Dialog Box - User Drivers Tab



NOTE: As of .AV Framework release 6.19, if the .AV Framework controller has been claimed into an XiO Cloud service account, all supported device drivers added to .AV Framework will be available for claiming and monitoring within XiO Cloud. For more information, refer to the XiO Cloud Service Third-Party Device Monitoring Configuration Guide.

Each installed driver is displayed in a table with the following information. If the table spans more than one page, use the navigational controls at the bottom of the section to move between pages. A **Search** field is also provided to display drivers that match a specific search term, and each table column can be filtered using the controls in the column header.

- **Type**: The device type (such as flat panel display or projector)
- **Manufacturer**: The device manufacturer
- **Supported Models**: The model series supported by the driver
- **Communication**: The communication method used by the device (such as IR, CEC, or serial)
- **Driver Version**: The installed driver version

Select **Close** or the **x** button to close the **Manage Device Drivers** dialog box.

The following additional settings are provided for user drivers.

Add a New Driver Manually

Additional device drivers can be downloaded from the Crestron Drivers web portal and loaded into .AV Framework to expand the number of compatible third-party devices. New device drivers are added to the Crestron Drivers web portal after they are tested and approved by Crestron.

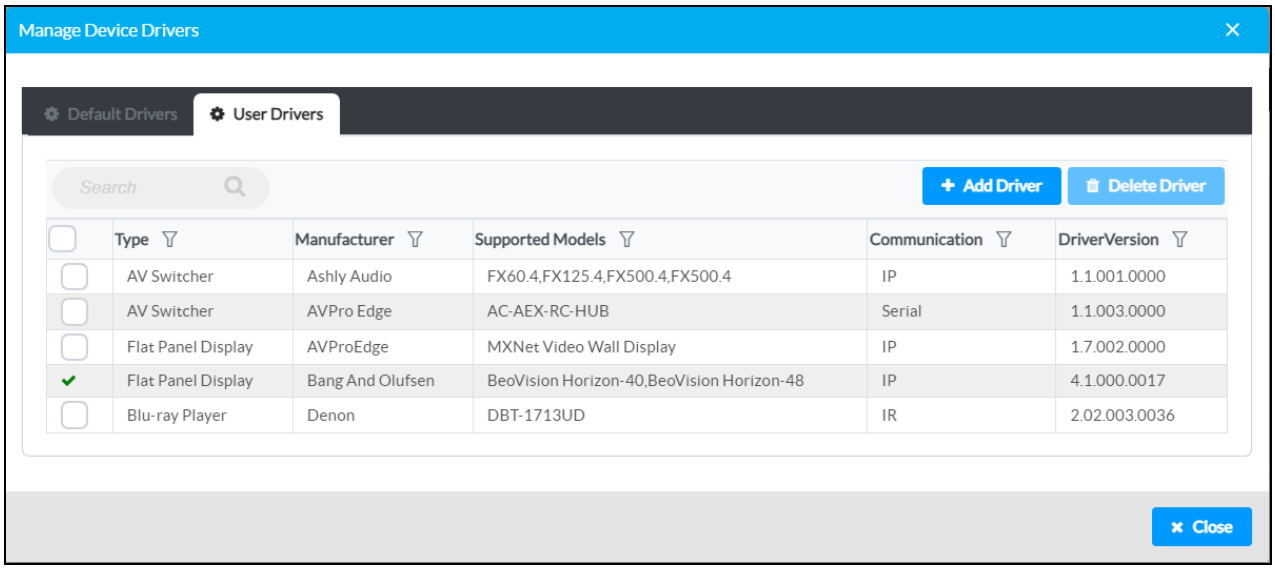
NOTE: New users to the Crestron Drivers web portal must create an account in order to search for and download device drivers.

Custom device drivers can also be created and loaded into .AV Framework. For more information and detailed developer instructions, refer to the Crestron Drivers SDK website at https://developer.crestron.com.

To load a new driver to the .AV Framework system manually:

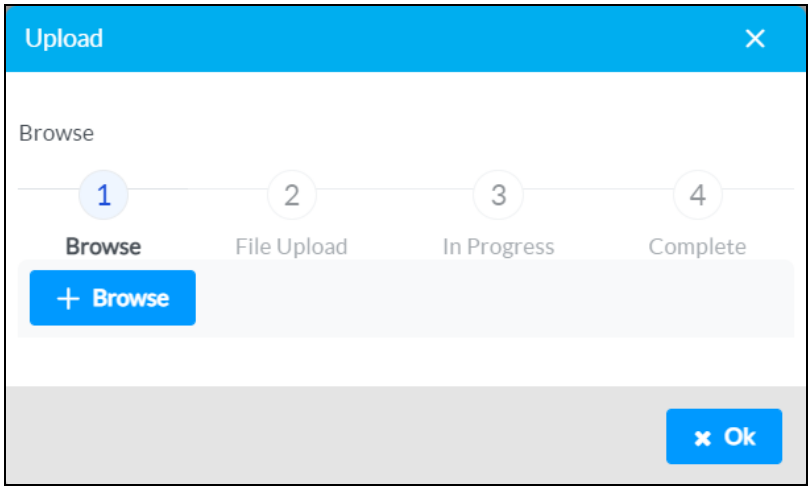
1. Select the **User Drivers** tab to display the User Driver settings.

   Manage Device Drivers Dialog Box - User Drivers Tab



2. Select **Add Driver**. An **Upload** dialog box is displayed.

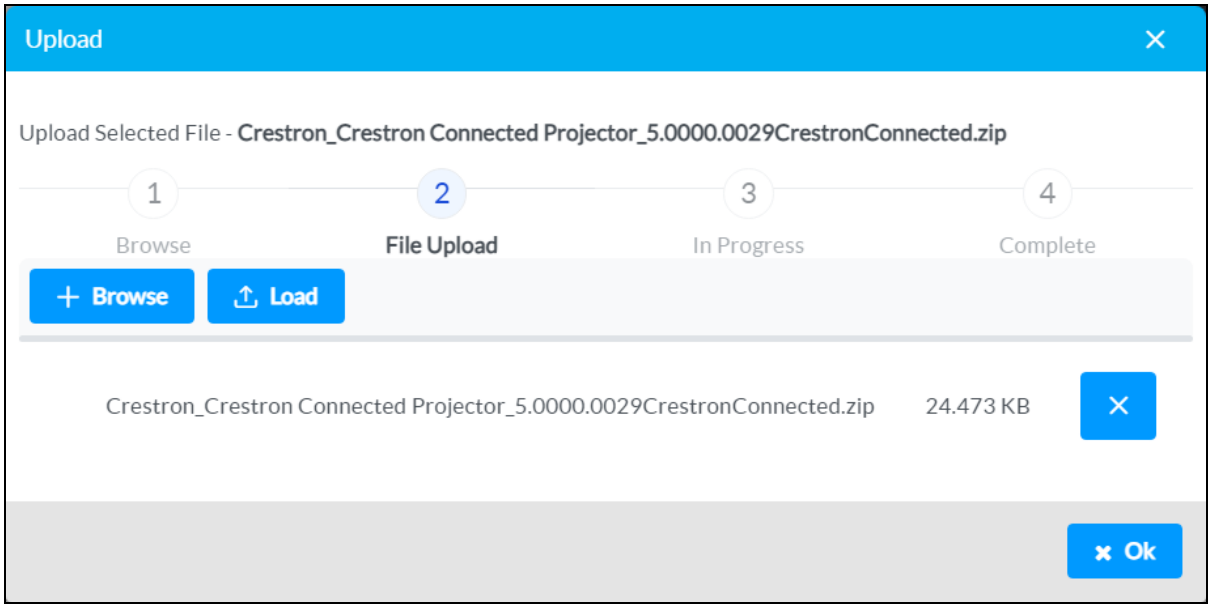
   Upload Dialog Box - Browser



3. Select **+ Browse**, and then navigate to the .zip file containing the driver .pkg files on the computer.

4. Select the driver .zip file, and then select **Open**. The driver information is shown in the **Upload** dialog box.

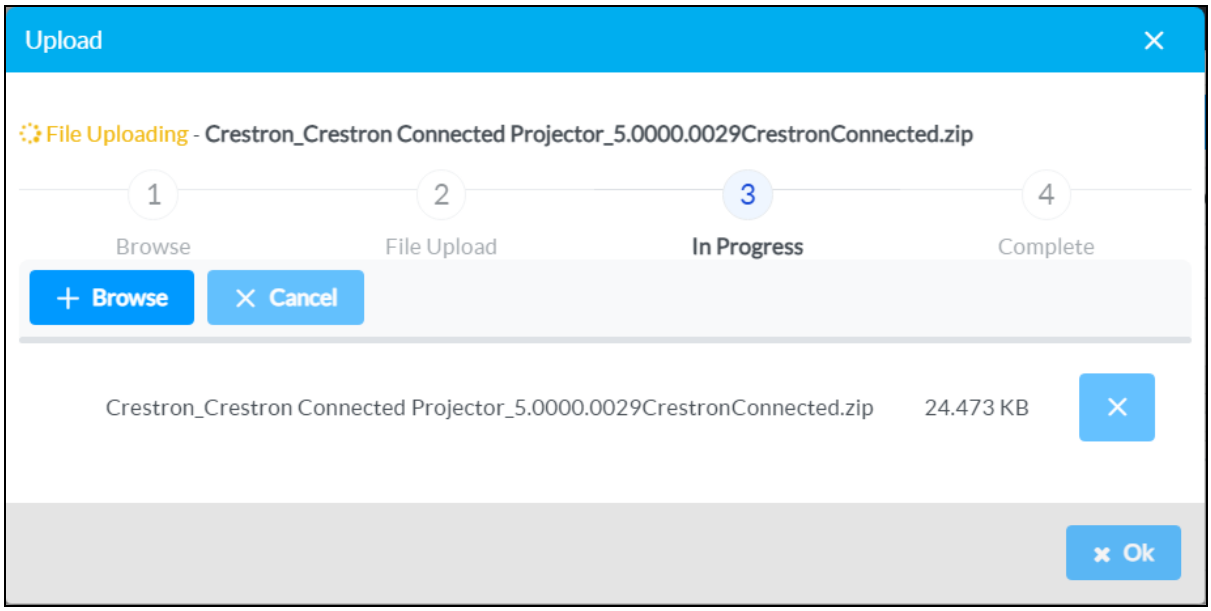
Upload Dialog Box - File Upload



5. Select **Load** to load the driver .zip file to .AV Framework. The upload progress is shown in the dialog box.

> **NOTE:** The installation can take several minutes if multiple drivers are uploaded at once.

Upload Dialog Box - File Upload



6. Once the driver has been loaded, select **Ok**. A toast notification is displayed once the driver has been installed successfully, and the new driver will appear as an entry within the **User Drivers** table.

NOTE: If the driver installation fails, ensure that the correct file was selected and that the Crestron Virtual Control server is functioning properly. If the driver installation continues to fail, contact Crestron True Blue support via phone, email, or chat as described at www.crestron.com/Support.

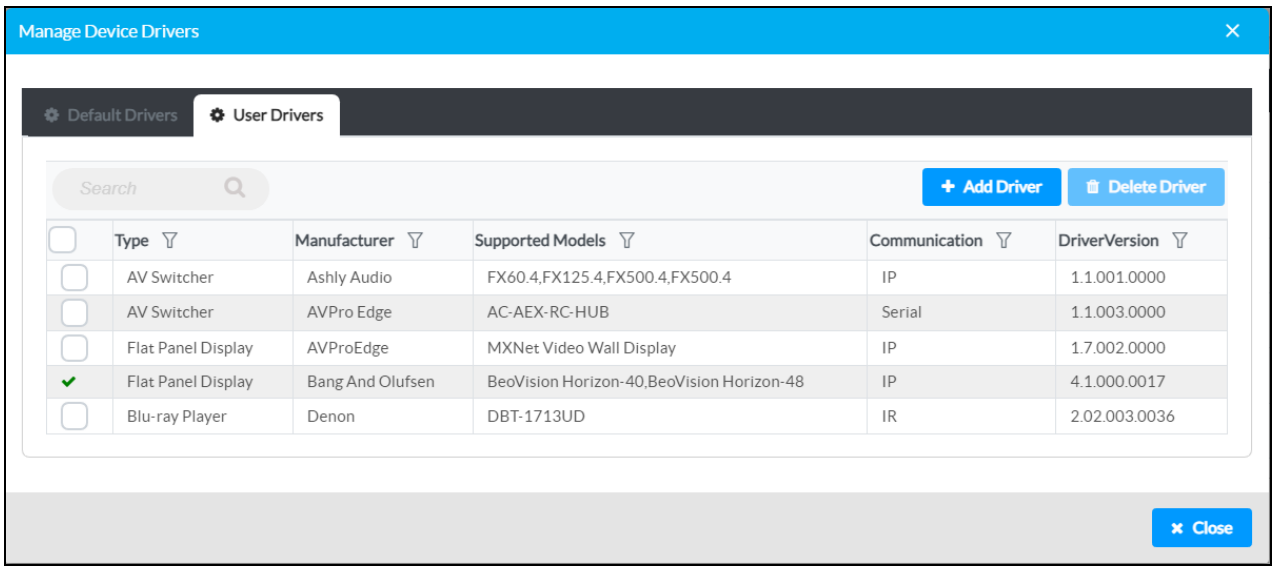
Delete a Driver

To delete a user driver from .AV Framework:

NOTE: A user driver can be deleted only if it is not actively being used with the .AV Framework system. The driver must be deactivated within the .AV Framework system before it can be deleted. An active driver shows a green check icon in the left side of its table row.

1. Select the **User Drivers** tab to display the User Driver settings.

   Manage Device Drivers Dialog Box - User Drivers Tab



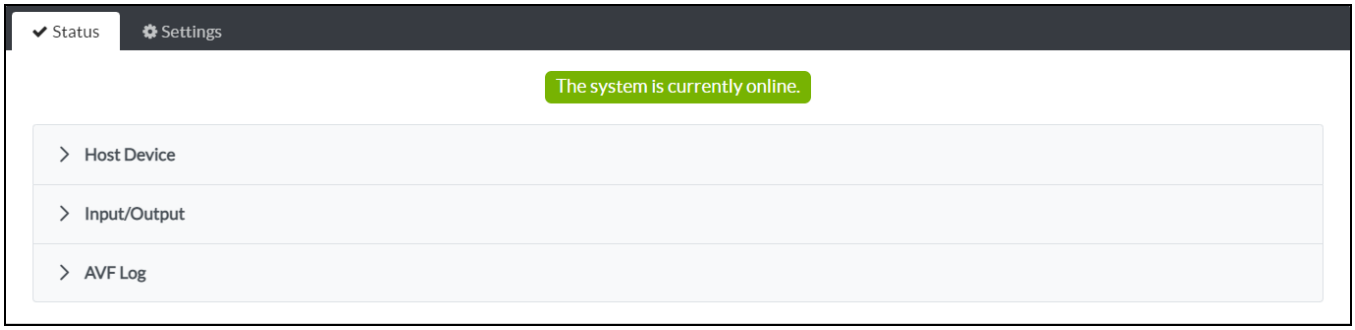
2. Fill the check box to the left of each table row of the driver(s) that will be deleted.
3. Select **Delete Driver**. The driver(s) are deleted from the User Drivers settings without a confirmation prompt.

Status

Select the **Status** tab on the top left of the interface to display accordions for viewing the status of the Crestron Virtual Control server, the input and output channels of the controlled A/V switcher device, and the system log files.

Select an accordion name to expand that accordion. If the accordion is expanded, select the accordion name again to collapse the accordion.

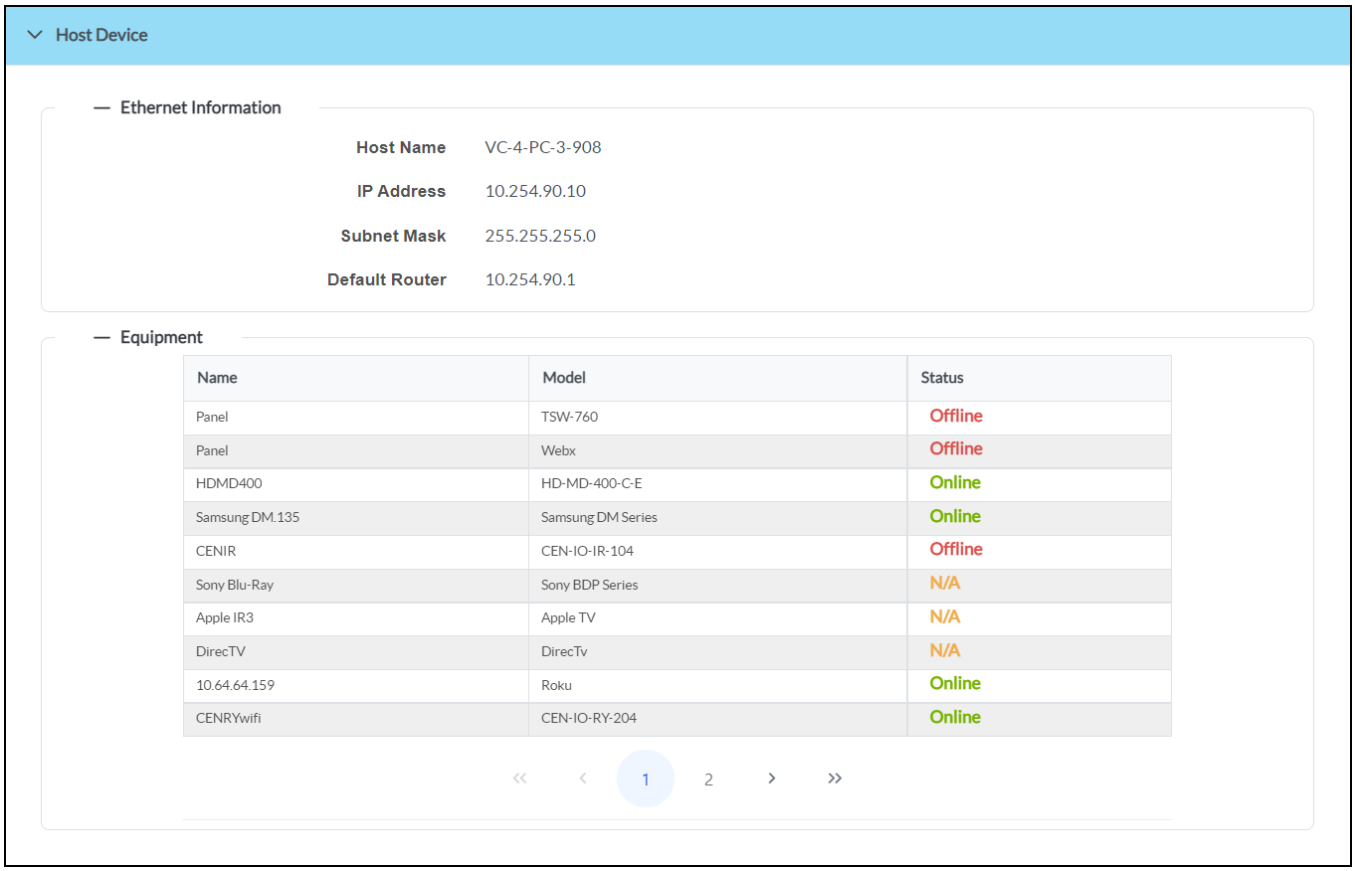
Status Tab Selections



Host Device

Select the **Host Device** accordion to view general information about the host Crestron Virtual Control server and devices connected to the .AV Framework room.

Host Device Accordion

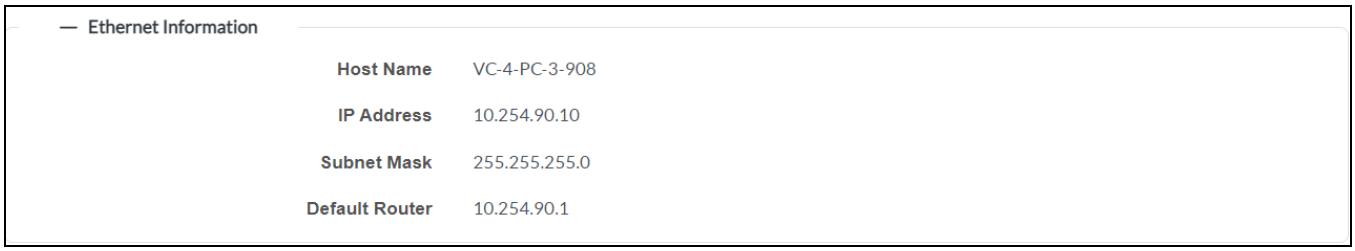


The following **Host Device** information is displayed.

Ethernet Information

Select the **+** (plus) icon next to **Ethernet Information** (if the section is not already expanded) to display the following Ethernet information for the host Crestron Virtual Control server.

Host Device Accordion - Ethernet Information

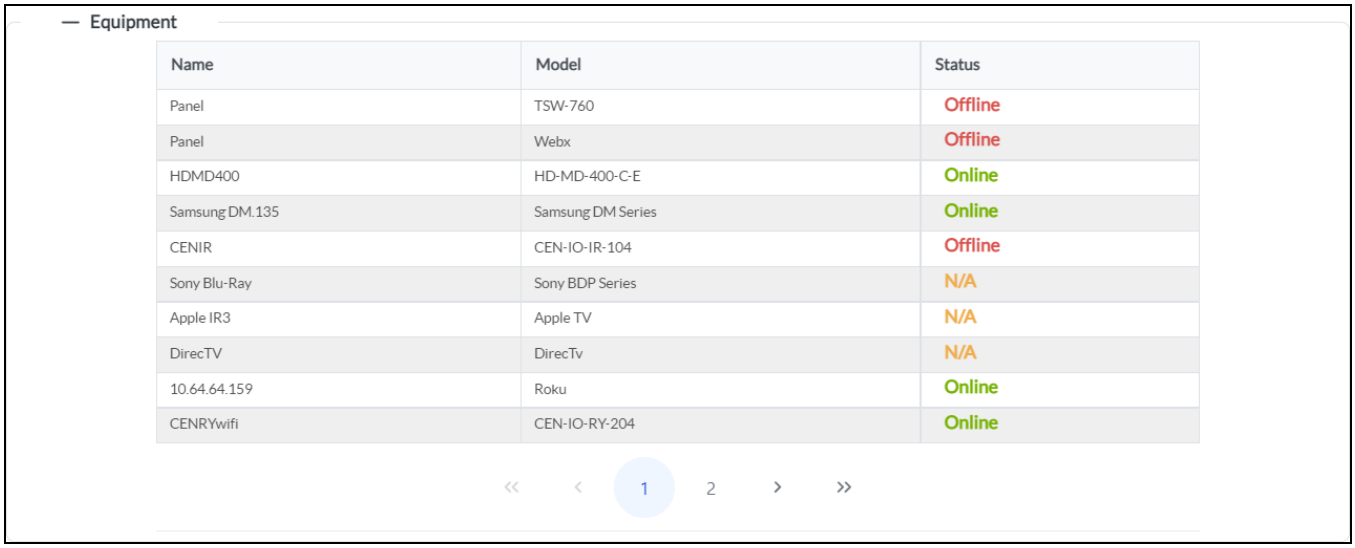


- **Host Name**: The Crestron Virtual Control server host name.
- **IP Address**: The Crestron Virtual Control server IP address.
- **Subnet Mask**: The Crestron Virtual Control server subnet mask address.
- **Default Router**: The Crestron Virtual Control server gateway router address.

Equipment

Select the **+** (plus) icon next to **Equipment** (if the section is not already expanded) to display information for devices connected to the .AV Framework room, including the A/V switcher.

Host Device Accordion - Equipment



Each connected device is displayed in a table with the following information. If the table spans more than one page, use the navigational controls at the bottom of the section to move between pages.

- **Name**: The user-defined device name.
- **IP Address**: The device model.

- **Status**: The connection status of the device:
  - **Online**: The device is detected and is providing feedback to .AV Framework.
  - **Offline**: The device was detected at one point, but it is no longer detected by .AV Framework.
  - **N/A**: The device status is not reported (shown for CEC-controlled displays, non-controlled displays, and IR-controlled devices.

For more information on connecting devices to .AV Framework, refer to Add New Devices on page 35.

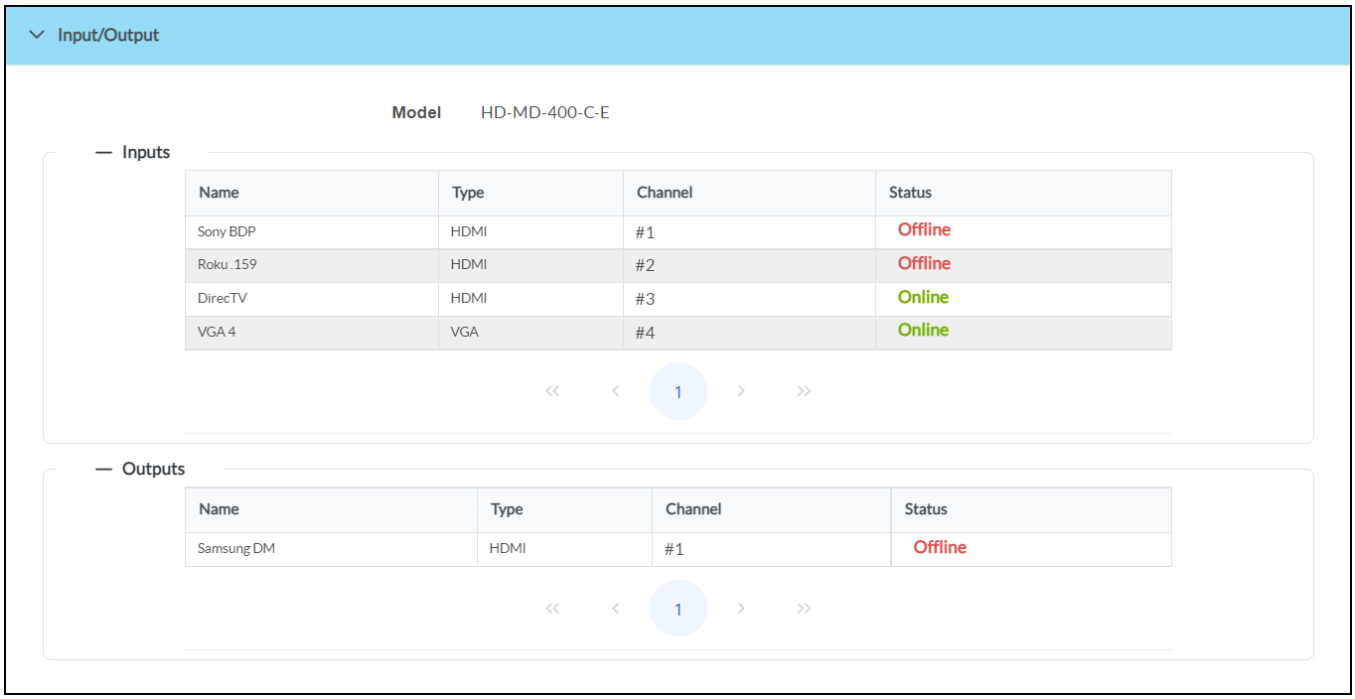
NOTE: Observe the following points regarding connected devices:

- A compatible switcher device must be added to the .AV Framework room before any other devices can be added. For more information, refer to Add an A/V Switcher on page 22.
- A TSW-760 touch screen and an XPanel virtual touch screen are added to new .AV Framework rooms by default. These devices can be deleted once an A/V switcher is added to the room.
- The XPanel virtual touch screen can be used to test the touch screen project through the Desktop XPanel interface. For more information, refer to XPanel on page 121.

Input/Output

Select the **Input/Output** accordion to view information about the input and output channels on the connected A/V switcher.

Input/Output Accordion



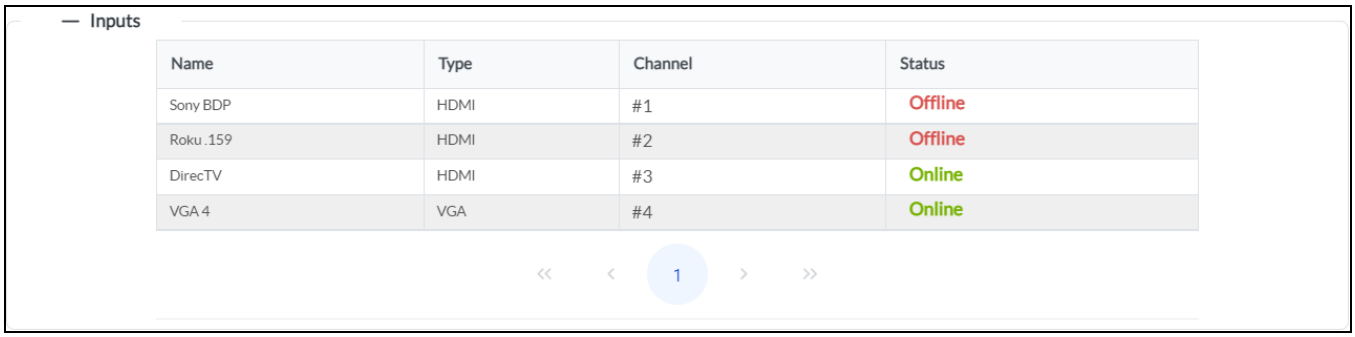
For more information on configuring input and output channels of the connected A/V switcher, refer to A/V Routing on page 84.

The following **Input/Output** information is displayed.

Inputs

Select the **+** (plus) icon next to **Inputs** (if the section is not already expanded) to display the following information for the connected A/V switcher input channels.

Input/Output Accordion - Inputs



Each input channel is displayed in a table with the following information. If the table spans more than one page, use the navigational controls at the bottom of the section to move between pages.

- **Name**: The user-defined input channel name.
- **IP Address**: The input channel type.
- **Channel**: The input channel number.
- **Status**: The connection status of the input channel:
  - **Online**: The connected source is sending content.
  - **Offline**: The connected source is not sending content, is not present, or is not reported.

Outputs

Select the **+** (plus) icon next to **Outputs** (if the section is not already expanded) to display the following information for the connected A/V switcher output channels.

Input/Output Accordion - Outputs



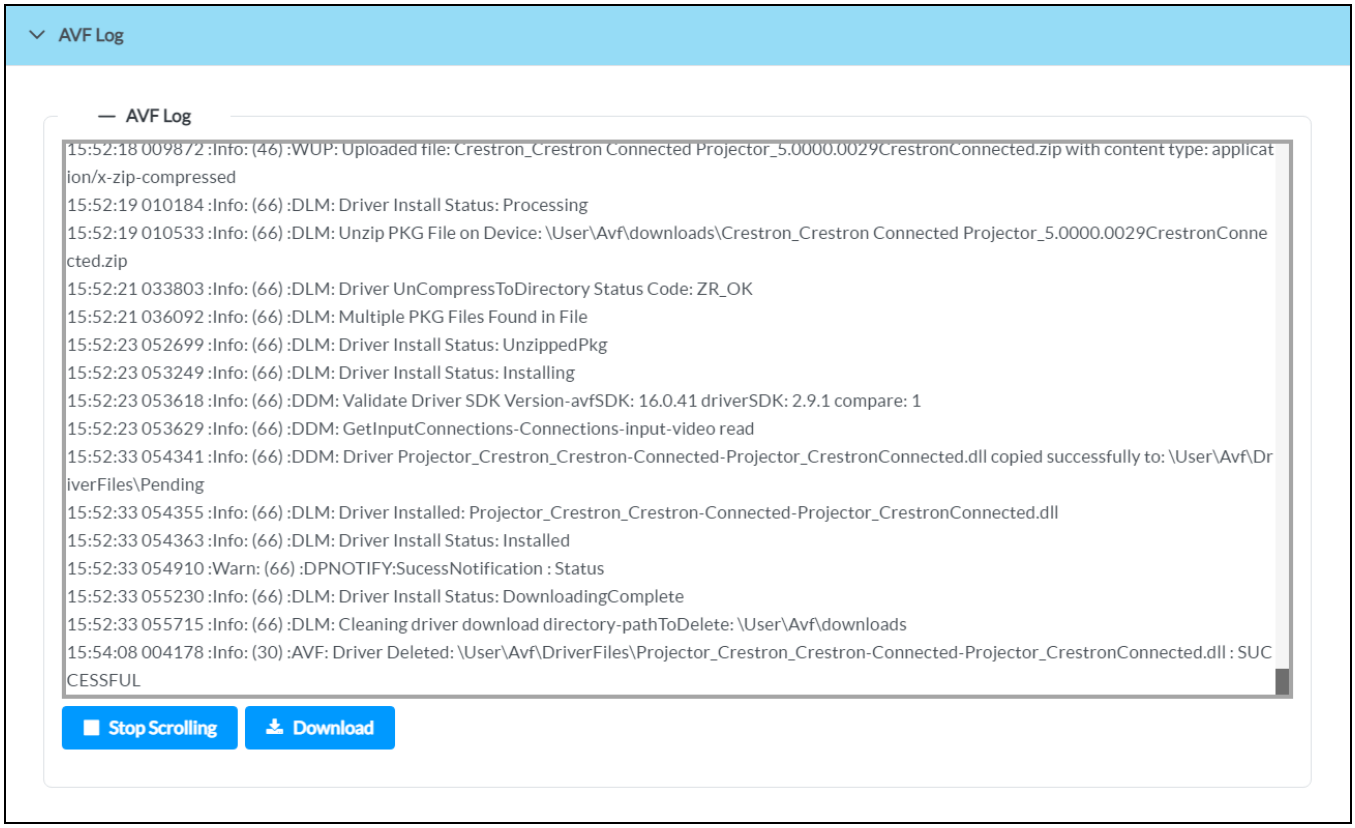
Each output channel is displayed in a table with the following information. If the table spans more than one page, use the navigational controls at the bottom of the section to move between pages.

- **Name**: The user-defined output channel name.
- **IP Address**: The output channel type.
- **Channel**: The output channel number.
- **Status**: The connection status of the output channel:
  - **Online**: The connected sync is receiving content.
  - **Offline**: The connected sync is not receiving content, is not present, or is not reported.

AVF Log

Select the **AVF Log** accordion to display the event log for .AV Framework. Event logs are recorded at a set interval and can be viewed and downloaded from this accordion.

AVF Log Accordion



The following logging controls are provided:

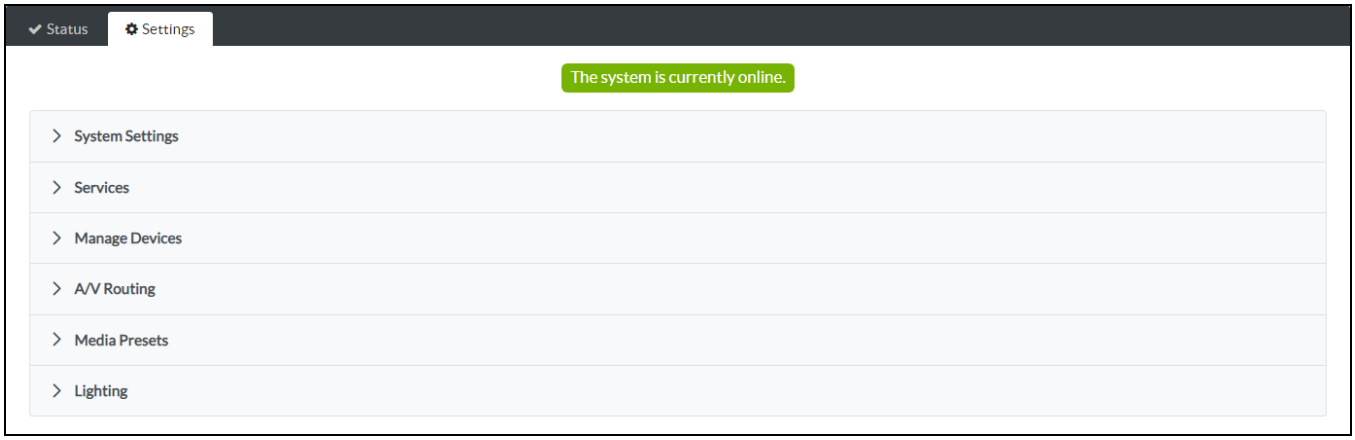
- Select **Stop Scrolling** to prevent the event log from automatically scrolling. Select **Start Scrolling** to resume scrolling if **Stop Scrolling** is selected.
- Select **Download** to download the event log to the local computer as a text file.

Settings

Select the **Settings** tab on the top left of the interface to display accordions for configuring the .AV Framework system settings, connected scheduling and monitoring services, connected devices, and routing for the controlled A/V switcher input and output channels.

Select an accordion name to expand that accordion. If the accordion is expanded, select the accordion name again to collapse the accordion.

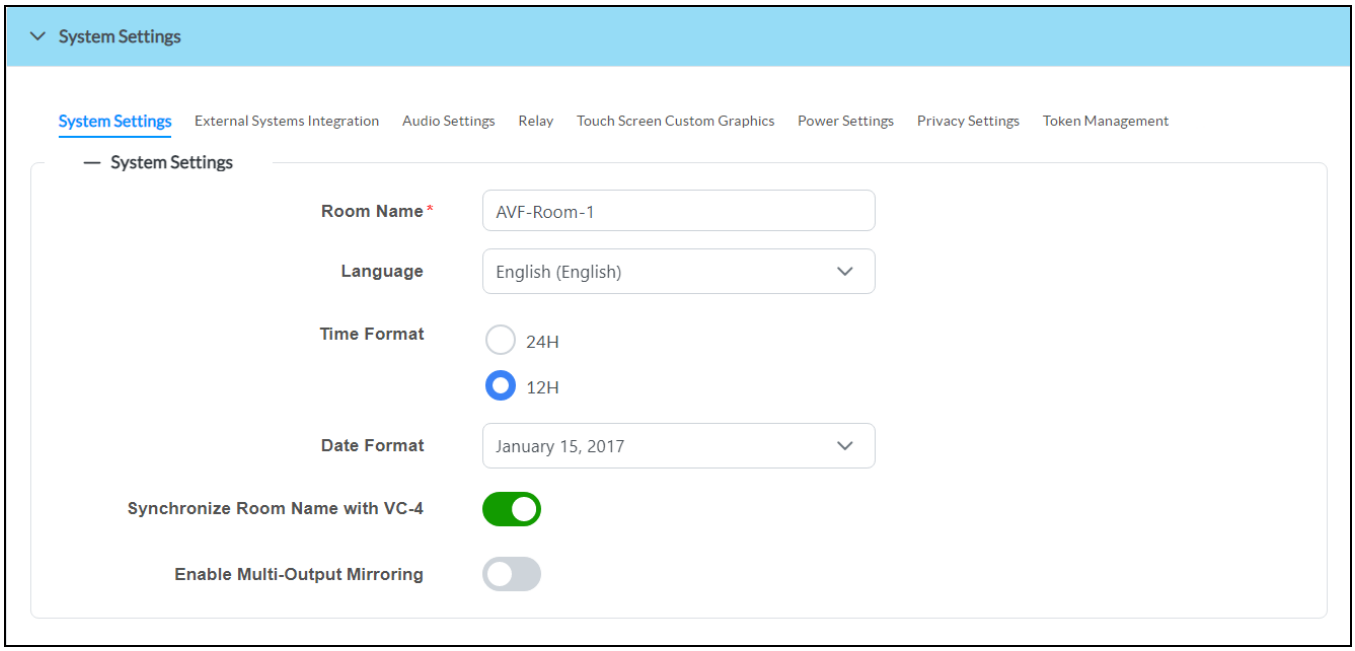
Settings Tab Selections



System Settings

Select the **System Settings** accordion to configure various system settings for the .AV Framework room.

System Settings Accordion



Use the tabs at the top of the accordion to move between the following settings. The **System Settings** tab is open by default.

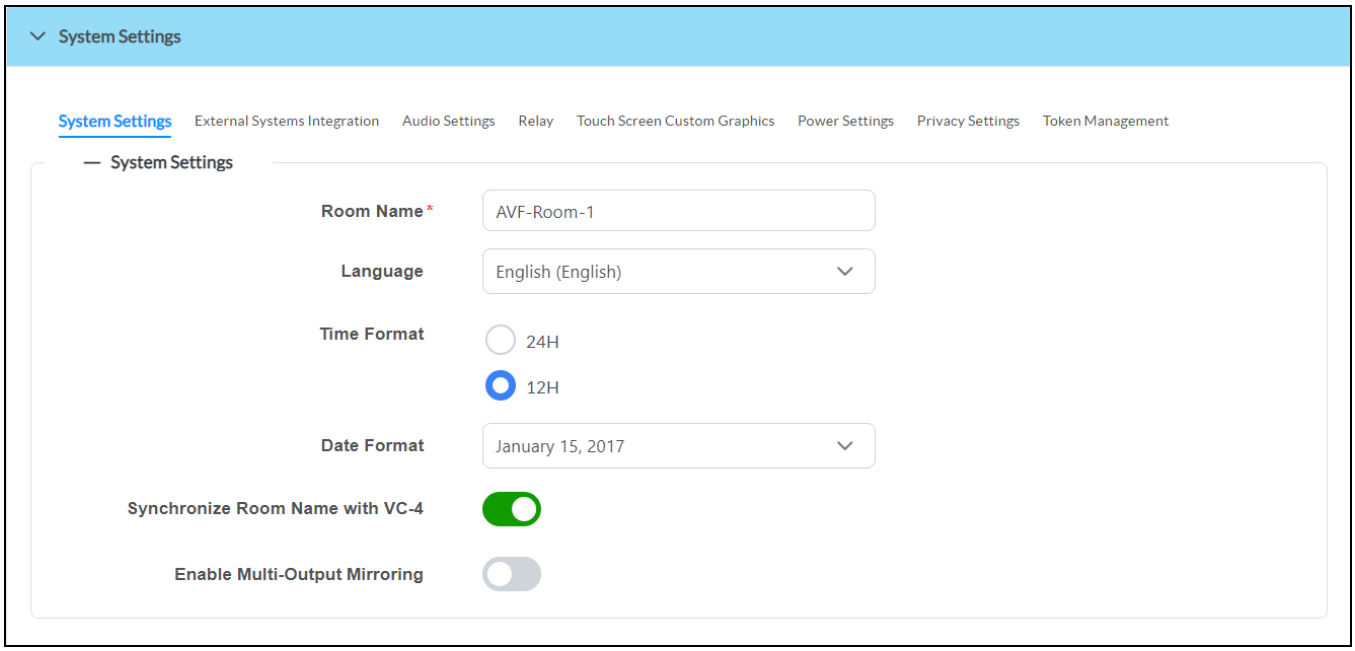
- **System Settings**
- **External Systems Integration**
- **Audio Settings**
- **Relay**
- **Touch Screen Custom Graphics**
- **Power Settings**
- **Privacy Settings**
- **Token Management**

Each setting is covered in the sections that follow.

System Settings

Select the **System Settings** tab in the **System Settings** accordion to configure settings for the .AV Framework system.

System Settings Accordion - System Settings



The following system settings can be configured:

- **Room Name**: Enter a name for the room associated with the system.
- **Language**: Use the drop-down menu to select the language displayed by .AV Framework.
- **Time Format**: Select the **24H** or **12H** radio buttons to display the system time in 24-hour or 12-hour format, respectively.
- **Date Format**: Use the drop-down menu to select a format for displaying the date.

- **Synchronize Room Name with VC-4**: Turn on the toggle to synchronize the .AV Framework room name with the Crestron Virtual Control room name. If turned on, the room name will update in both locations after the room is stopped and restarted in the Crestron Virtual Control web interface.

  > **NOTE:** When an existing configuration is upgraded or uploaded, room name sync is tuned off by the software and must be manually turned on afterward.

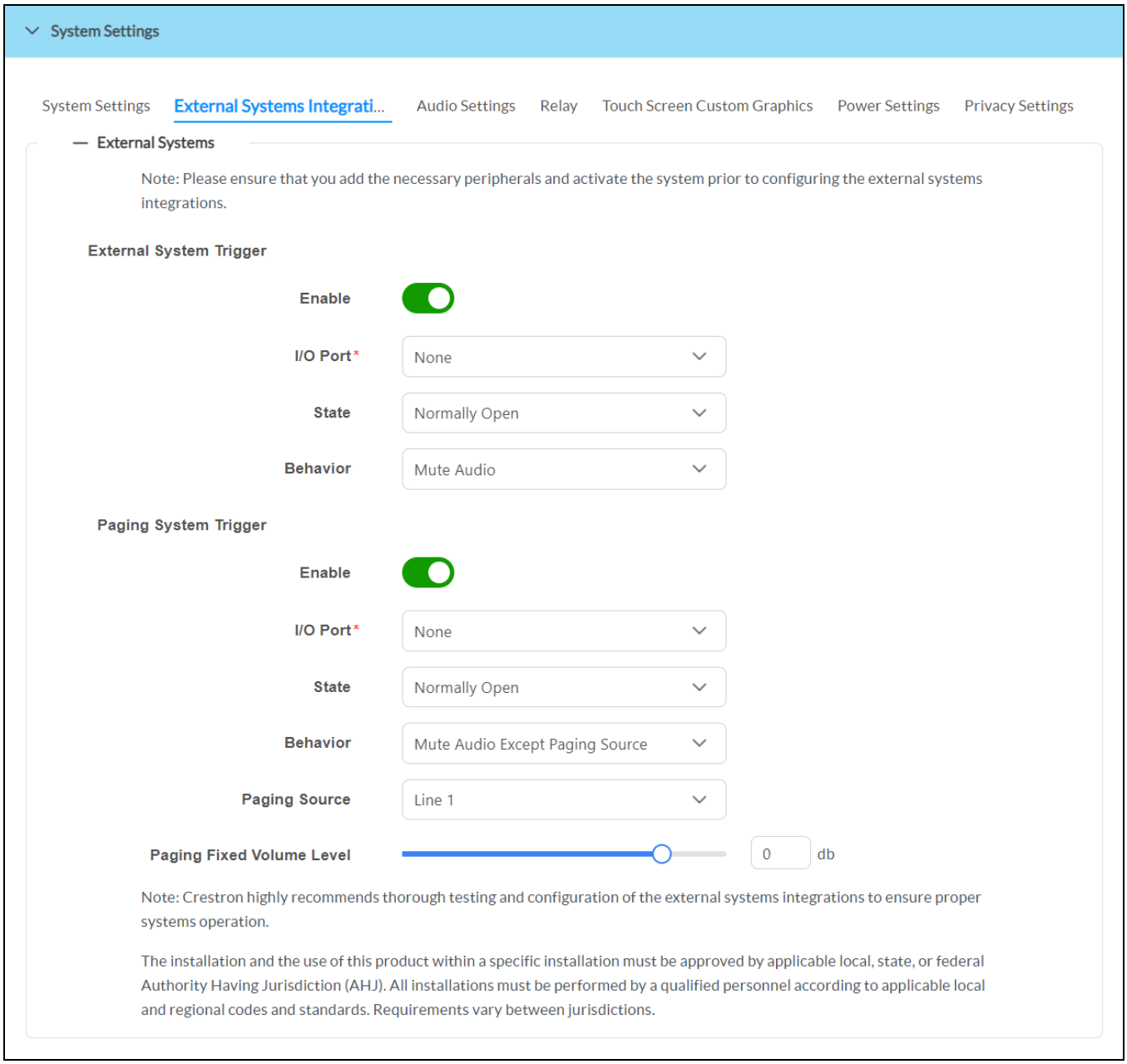
- **Enable Multi-Output Mirroring**: Turn on the toggle to use multi-output mirroring behavior for the system. If turned on, a single output can be mirrored to multiple displays or projectors (via a distribution amplifier or splitter). This behavior allows for the proper room on/off, default input selection, and warm-up/cool-down messages to be displayed for all the displays or projectors in the system (if the driver is capable of supporting them).

External Systems Integration

Select the **External Systems Integration** tab in the **System Settings** accordion to configure external systems integration settings for the .AV Framework system.

> **NOTE:** The **External Systems Integration** tab is shown only if I/O ports are present in the .AV Framework system by adding an HD-CTL-101.

System Settings Accordion - External Systems Integration



The configuration options displayed in this section are dependent on the external amplifier settings and flat panel display devices connected to the .AV Framework system.

External systems integration involves certain requirements, considerations, and limitations that should be reviewed carefully prior to integration. For detailed information, refer to Appendix C: External Systems Integration on page 151.

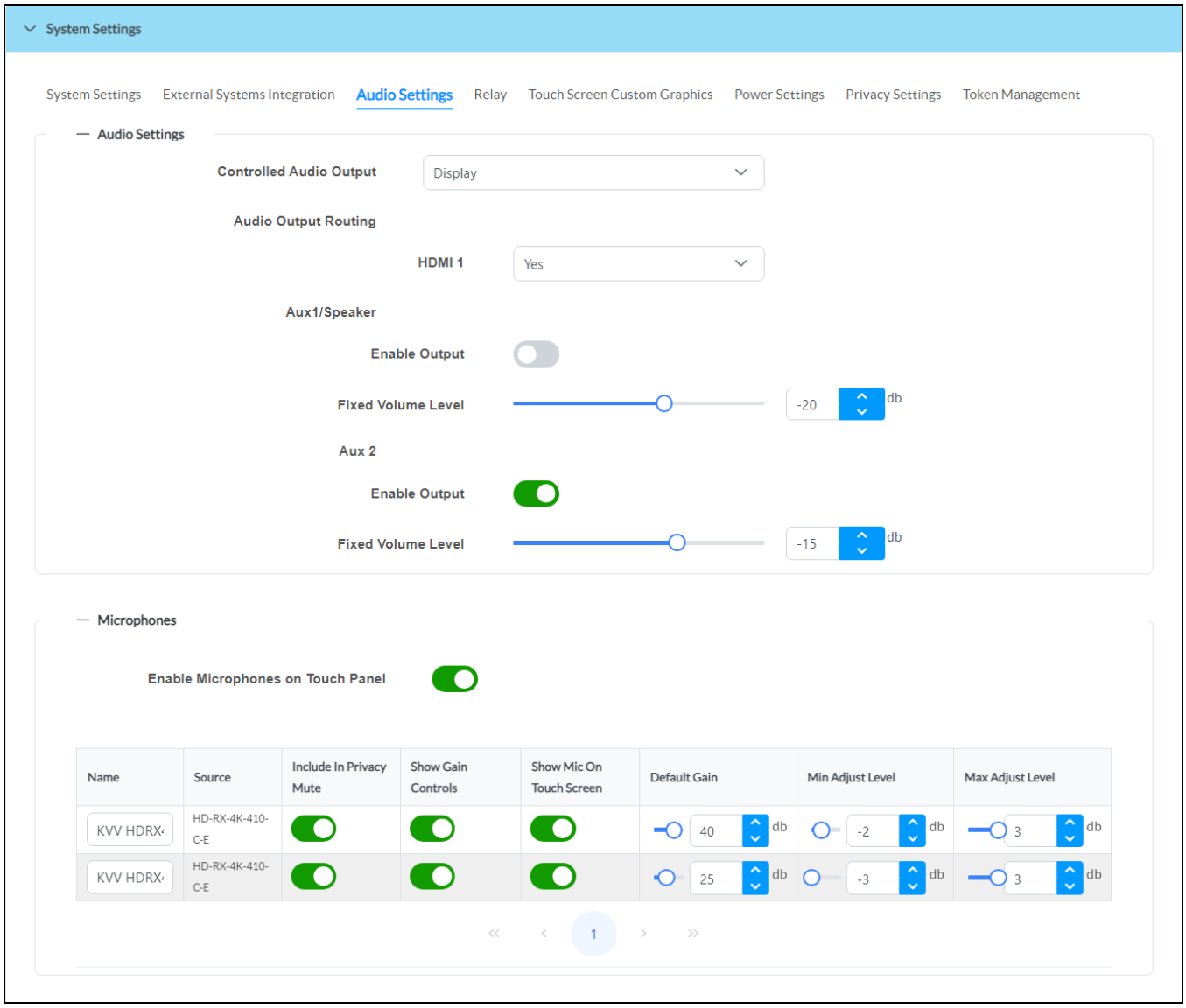
The following external systems integration settings can be configured:

- **External System Trigger**: External system triggers are used to trigger certain configured behavior (such as system off or audio mute) within the .AV Framework system.
    - **Enable**: Turn on the toggle to use external system triggers.
    - **I/O Port**: If **Enable** is turned on, use the drop-down menu to select an available I/O port on the HD-CTL-101 used to control the trigger.
    - **State**: If **Enable** is turned on, select the default latching state for the trigger.
        - **Normally Open**: The external trigger is latched based on normally open logic. (The trigger will occur only when the circuit is closed.)
        - **Normally Closed**: The external trigger is latched based on normally closed logic. (The trigger will occur only when the circuit is opened.)
    - **Behavior**: If **Enable** is turned on, use the drop-down menu to select the behavior associated with the external system trigger.
        - **Turn Off System**: The .AV Framework system powers off when the external trigger is initiated.
        - **Mute Audio**: Audio for the .AV Framework system is muted throughout the duration of the external system trigger.
- **Paging System Trigger**: Paging system triggers are used to trigger certain configured behavior within the .AV Framework system, including paging events (such as emergency notifications).
    - **Enable**: Turn on the toggle to use paging system triggers.
    - **I/O Port**: If **Enable** is turned on, use the drop-down menu to select an available I/O port on the HD-CTL-101 used to control the trigger.
    - **State**: If **Enable** is turned on, select the default latching state for the trigger.
        - **Normally Open**: The external trigger is latched based on normally open logic. (The trigger will occur only when the circuit is closed.)
        - **Normally Closed**: The external trigger is latched based on normally closed logic. (The trigger will occur only when the circuit is opened.)
    - **Behavior**: If **Enable** is turned on, use the drop-down menu to select the behavior associated with the external system trigger.
        - **Mute Audio**: Audio for the .AV Framework system is muted throughout the duration of the external system trigger.
        - **Mute Audio Except Paging Source**: Audio for the .AV Framework system is muted throughout the duration of the external system trigger except for the paging source.
    - **Paging Source**: If **Behavior** is set to **Mute Audio Except Paging Source**, use the drop-down menu to select an available audio output on the A/V switcher that is configured as the paging source.
    - **Paging Fixed Volume Level**: If **Behavior** is set to **Mute Audio Except Paging Source**, use the slider to select a fixed decibel level for the paging volume or enter a value manually in the text field.

Audio Settings

Select the **Audio Settings** tab in the **System Settings** accordion to configure audio settings for the .AV Framework system, including microphone settings (if supported).

System Settings Accordion - Audio Settings



The configuration options displayed in this section differ depending on the A/V switcher model used and the system audio configuration.

The following audio settings can be configured:

- **Controlled Audio Output**: Use the drop-down menu to select the audio output in the system that will be controlled. The selected output controlled by pressing the volume up/down buttons on the touch screen Interface. .AV Framework supports one controlled audio output.
    - If **Analog Audio Output** is selected, the A/V switcher controls the volume for an analog audio output (if supported).

    - If **Display** is selected, the A/V switcher controls the volume for a connected display device (if supported).
    - If a custom audio mixer device is selected, the A/V switcher controls the volume through the connected audio mixer.
- **Audio Output Routing**: Use the drop-down menus to select the audio routing behavior for the available audio output(s):
    - **Yes**: Audio is routed to the output channel.
    - **No**: Audio is not routed to the output channel.

The following volume control options can be configured depending on whether they are supported by the selected controlled audio output:

- **Enable Output**: Turn on the toggle to use the audio output in the system.
- **Fixed Volume Level**: Use the slider to select a fixed volume decibel level for the output or enter a value manually in the text field.

If an HD-PS series, HD-RX-4K-410-C-E, or HD-RX-4K-510-C-E device has been added as the system switcher or if an audio mixer has been configured in the system, turn on the **Enable Microphones on Touch Panel** toggle to allow connected microphones to be controlled from the touch screen user interface. This control is also provided if a supported microphone device has been added to the .AV Framework system via a device driver. For more information, refer to Operation on page 90.

> **NOTE:** Gain and mute can be controlled directly through the microphone driver for individual microphone devices.

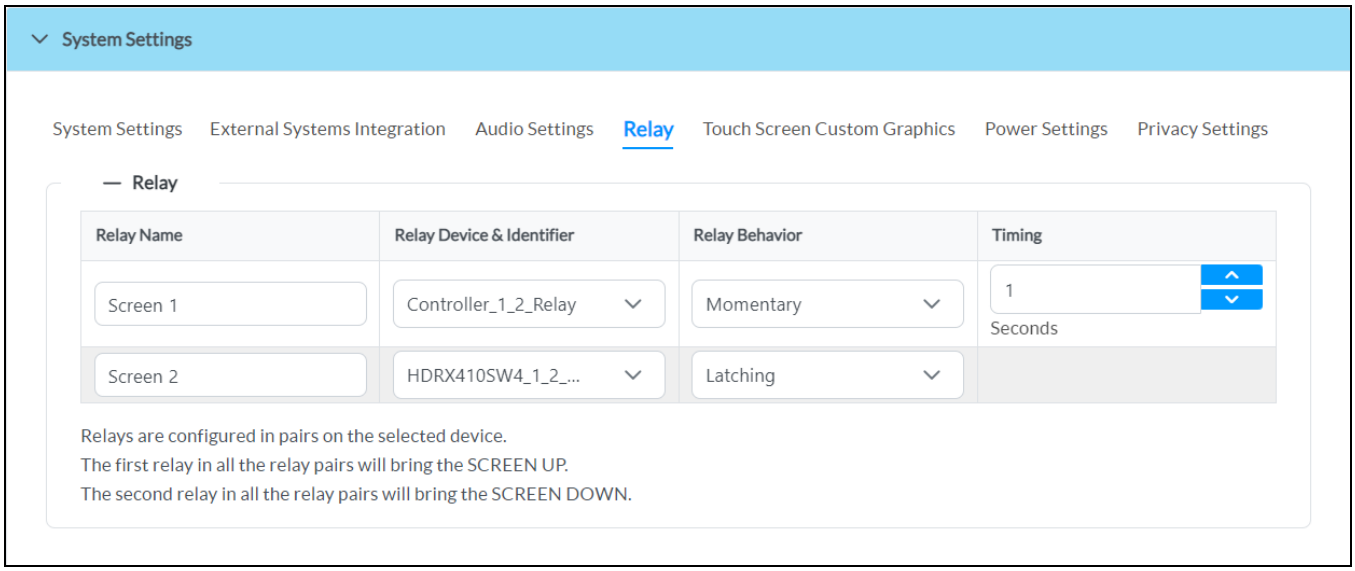
Each microphone configured on the switcher or audio mixer is shown in a table with the following controls and information:

- **Name**: Enter a user-defined name for the microphone that is displayed in the touch screen user interface.
- **Source**: The switcher or audio mixer source that contains the microphone.
- **Include In Privacy Mute**: Turn on the toggle to mute the microphone whenever privacy mute is activated in the system (regardless of the current microphone mute setting).
- **Show Gain Controls**: Turn on the toggle to expose gain controls for the microphone on the touch screen user interface.
- **Show Mic On Touch Screen**: Turn on the toggle to expose the microphone controls on the touch screen user interface.
- **Default Gain**: Sets the default gain level for the microphone (in dB).
- **Min Adjust Level**: Sets the range in which the microphone level can be lowered from its initial default value (-3 to 0 dB).
- **Max Adjust Level**: Sets the range in which the microphone level can be raised from its initial default value (0 to +3 dB).

Relay

Select the **Relay** tab in the **System Settings** accordion to select a relay behavior for connected video display sources, such as a projector.

System Settings Accordion - Relay



Each connected video display source is displayed in table. The following relay settings can be configured per video display source:

- **Relay Name**: Enter a name for the relay.
- **Relay Device & Identifier**: Use the drop-down menu to select a relay pair from the available configured devices.

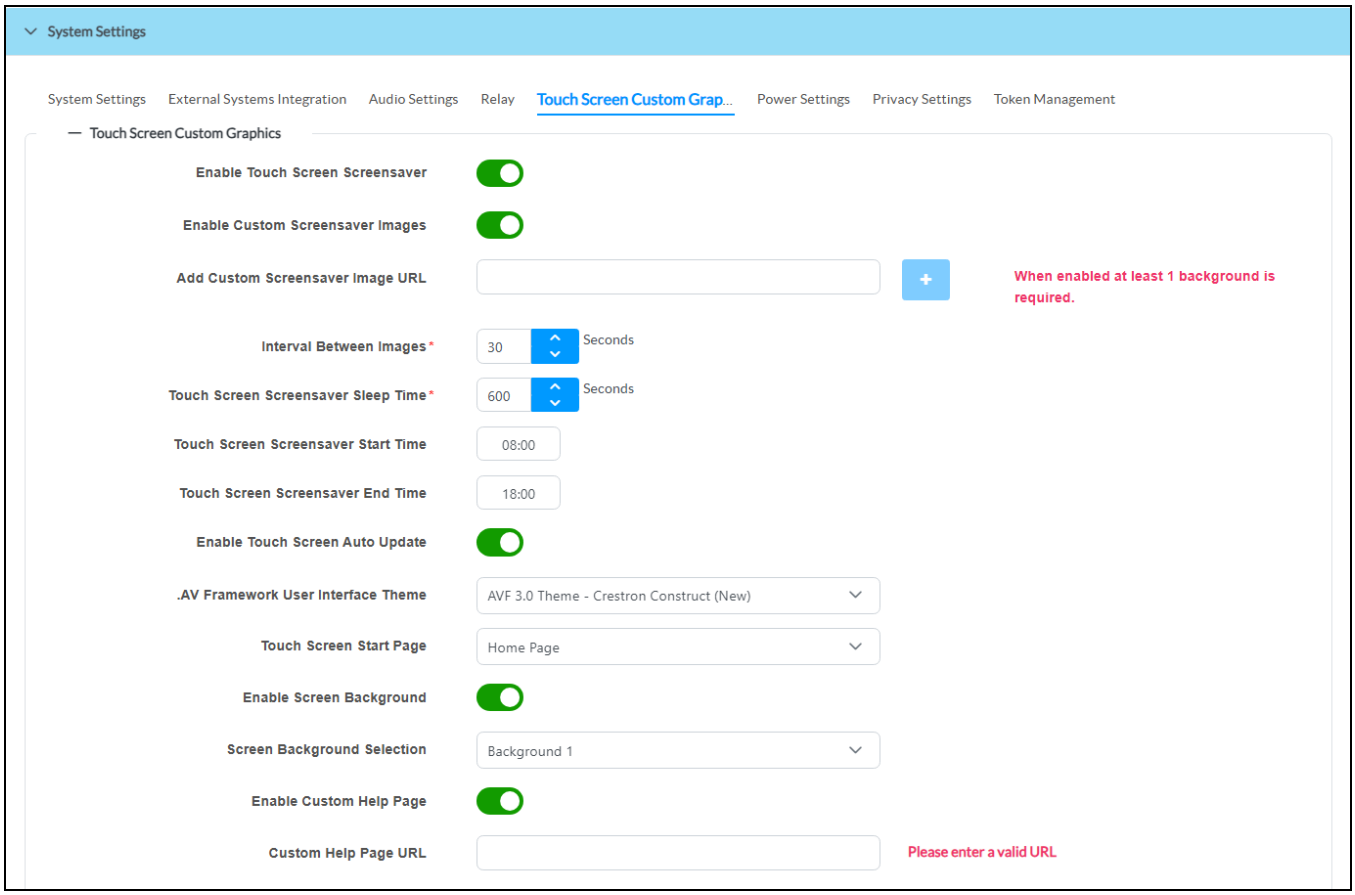
  > **NOTE:** A specific device relay pair can have only one saved configuration.

- **Relay Behavior**: Use the drop-down menu to select one of the following relay behaviors for the chosen relay pair:
  - **Momentary**: The chosen video source is set (turned on) or reset (turned off) by a relay command and remains in the selected state for the duration specified in the Timing field.
  - **Latching**: The chosen video source is set (turned on) or reset (turned off) by a relay command and remains in the selected state until an inverse relay command is sent.
  - **Disable**: Relay behavior is turned off for the chosen video source.
- **Timing**: If **Momentary** is selected for **Relay Behavior**, enter the duration in seconds that the video source remains in a specified state following a relay command.

Touch Screen Custom Graphics

Select the **Touch Screen Custom Graphics** tab in the **System Settings** accordion to configure screensavers, backgrounds, and themes for the .AV Framework touch screen project.

System Settings Accordion - Touch Screen Custom Graphics



The following touch screen custom graphics settings can be selected:

- **Enable Custom Logo Graphic**: Turn on the toggle to set a custom logo graphic for the touch screen project. Custom logo graphics can be set only if .AV Framework is not connected to Crestron Fusion.
- **Custom Logo Graphic URL**: If **Enable Custom Logo Graphic** is turned on, enter the URL of the desired custom logo graphic source file. A preview of the image is displayed below this setting if the source file URL is valid.

  > **NOTES:**
  >
  > - .AV Framework allocates an area of 800 x 600 pixels for the custom logo graphic. Custom graphics larger than 800 x 600 pixels are not accepted and must be scaled down manually. Custom graphics smaller than 800 x 600 pixels are not scaled up, so these graphics should be resized for optimal image quality.
  > - Supported custom graphic file types are BMP, JPG, and PNG.

- **Enable Touch Screen Screensaver**: Turn on the toggle to use a touch screen screensaver for the touch screen project.
- **Username**: If **Enable Touch Screen Screensaver** is turned on, enter the admin account username for the touch screen.

- **Password**: If **Enable Touch Screen Screensaver** is turned on, enter the admin account password for the touch screen.
- **Enable Start Button**: If **Enable Touch Screen Screensaver** is turned on, turn on the toggle to add a **START** button to the touch screen project. The **START** button will display only if .AV Framework is not connected to a scheduling calendar.

  > **NOTE:** The **START** button is used to switch to the system's default route for systems that are not connected to a scheduling calendar. For more information, refer to Home Screen Overview on page 95.

- **Start Button Text**: If **Enable Start Button** is turned on, enter text that will be displayed on the **START** button in the touch screen project.
- **Enable Custom Screensaver Backgrounds**: If **Enable Touch Screen Screensaver** is turned on, turn on the toggle to use custom background graphics for the touch screen screensaver.
- **Add Custom Screensaver Background URL**: If **Enable Custom Screensaver Backgrounds** is turned on, enter the URL of the desired custom background image source file.

  > **NOTE:** Observe the following when choosing a custom background image file:
  >
  > - Up to 15 custom background URLs can be added. Select the plus (**+**) button next to a text field to add a new background URL once the URL has been entered. Select the minus (**-**) button next to an existing background URL to delete the URL. At least one background is required if **Enable Custom Screensaver Backgrounds** is turned on.
  > - .AV Framework allocates an area of 800 x 600 pixels for the custom screensaver background graphic. Custom graphics larger than 800 x 600 pixels are not accepted and must be scaled down manually. Custom graphics smaller than 800 x 600 pixels are not scaled up, so these graphics should be resized for optimal image quality.
  > - Supported custom graphic file types are BMP, JPG, and PNG.

- **Interval Between Backgrounds**: Enter the duration in seconds that a background image is displayed on the screensaver before switching to the next image.
- **Touch Screen Screensaver Sleep Time**: Enter the time in seconds that the touch screen must be idle before the screensaver is activated.
- **Touch Screen Screensaver Start Time**: Enter the time of day in 24-hour format when the screensaver becomes active.
- **Touch Screen Screensaver End Time**: Enter the time of day in 24-hour format when the screensaver becomes inactive.
- **Enable Touch Screen Auto Update**: Turn on the toggle to use automatic updates for the .AV Framework .ch5z project file on a supported touch screen.

  > **NOTE:** As of .AV Framework version 7.00, automatic updates are supported only for **AVF 3.0 Theme - Crestron Construct (New)** project files. Legacy project files can no longer be updated automatically.

> **NOTE:** The **Enable Touch Screen Auto Update** toggle is hidden when the touch screen project is added as part of the program library in Crestron Virtual Control. For more information on loading touch screen projects, refer to Appendix F: Load Touch Screen Projects on page 180

    - If an .AV Framework .ch5z project file has not been previously loaded to the touch screen, the auto update mechanism downloads the latest .ch5z file for the chosen **.AV Framework User Interface Theme** and loads it to the touch screen. The existing project file on the touch screen is overwritten.
    - If an .AV Framework .ch5z project file has been previously loaded to the touch screen, the auto update mechanism updates the project file only if the hash file on the touch screen is different from the hash on the remote server or cloud.

- **.AV Framework User Interface Theme**: If **Enable Touch Screen Auto Update** is turned on, use the drop-down menu to select between **AVF 1.0 Theme - Smart Grahpics (Legacy)**, **AVF 2.0 Theme - Smart Graphics (Legacy)**, **AVF 2.0 Theme - Crestron HTML5 (Legacy)**, and **AVF 3.0 Theme - Crestron Construct (New)**. For more information on these themes, refer to Display Overview on page 90.
- **Touch Screen Start Page**: Use the drop-down menu to determine the start page in the touch screen project (home page, media selection page, or source routing page).
- **Enable Screen Background**: If **AVF 3.0 Theme - Crestron Construct (New)** is selected for **.AV Framework User Interface Theme**, turn on the toggle to use a predefined background for the touch screen project.
- **Screen Background Selection**: If **Enable Screen Background** is turned on, use the drop-down menu to select one of the available backgrounds to use for the touch screen project.
- **Enable Advanced Multi Display Routing**: Turn on the toggle to turn on advanced multiple display routing for the .AV Framework system. When this setting is turned on, the touch screen project shows a new routing page that allows individual video sources to be selected and routed to different displays in the system. For more information, refer to Present a Source Screen - Advanced Multi Display Routing on page 103.

  > **NOTE:** The **Enable Advanced Multi Display Routing** setting is available only if using an A/V switcher that supports multiple outputs and only if **AVF 2.0 Theme - Smart Graphics (Legacy)** or **AVF 3.0 Theme - Crestron Construct (New)** is selected for **.AV Framework User Interface Theme**.

- **Enable Press and Hold for Source Control**: If **Enable Advanced Multi Display Routing** is turned on, turn on the toggle to use press and hold functionality for advanced multiple display routing. If this setting is turned on, users can press and hold video sources in the display routing page to navigate to that source in the touch screen project.
- **Hold Duration**: If **Enable Press and Hold for Source Control** is turned on, enter the duration (in seconds) that a user must press and hold on a video source to navigate to that source in the touch screen project.

- **Enable Custom Help Page**: Turn on the toggle to display a custom help page image in the touch screen project. When turned on, the uploaded custom help page image replaces the default help overlay when the on-screen **Help** button (AVF 1.0 UI) or information button (AVF 2.0 UI and AVF 3.0 UI) is tapped.
- **Custom Help Page URL**: If **Enable Custom Help Page** is turned on, enter the URL of the desired custom help page image source file. A preview of the image is displayed below this setting if the source file URL is valid.

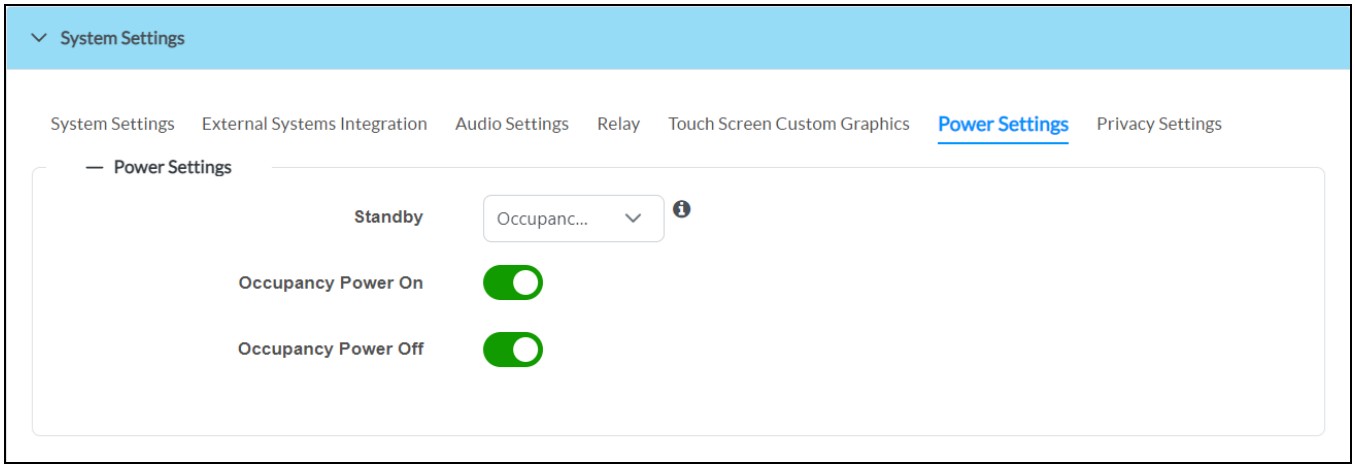
  NOTES:

  - .AV Framework allocates an area of 800 x 600 pixels for the custom help file graphic. Custom graphics larger than 800 x 600 pixels are not accepted and must be scaled down manually. Custom graphics smaller than 800 x 600 pixels are not scaled up, so these graphics should be resized for optimal image quality.
  - Supported custom graphic file types are BMP, JPG, and PNG.

Power Settings

Select the **Power Settings** tab in the **System Settings** accordion to manage how the .AV Framework system powers on and off.

System Settings Accordion - Power Settings (Occupancy Based)



Use the **Standby** drop-down menu to select the power setting for the .AV Framework system. The controls provided change based on the selected power setting.

- **Occupancy Based**: The system powers on or off based on room occupancy detection. A functional occupancy sensor must be added to the system to use this setting.
- **Video Sync Based**: The system powers on or off based on a video sync connection.
- **Always On**: The system is always on at given days and times regardless of occupancy or video sync status.

Occupancy Based

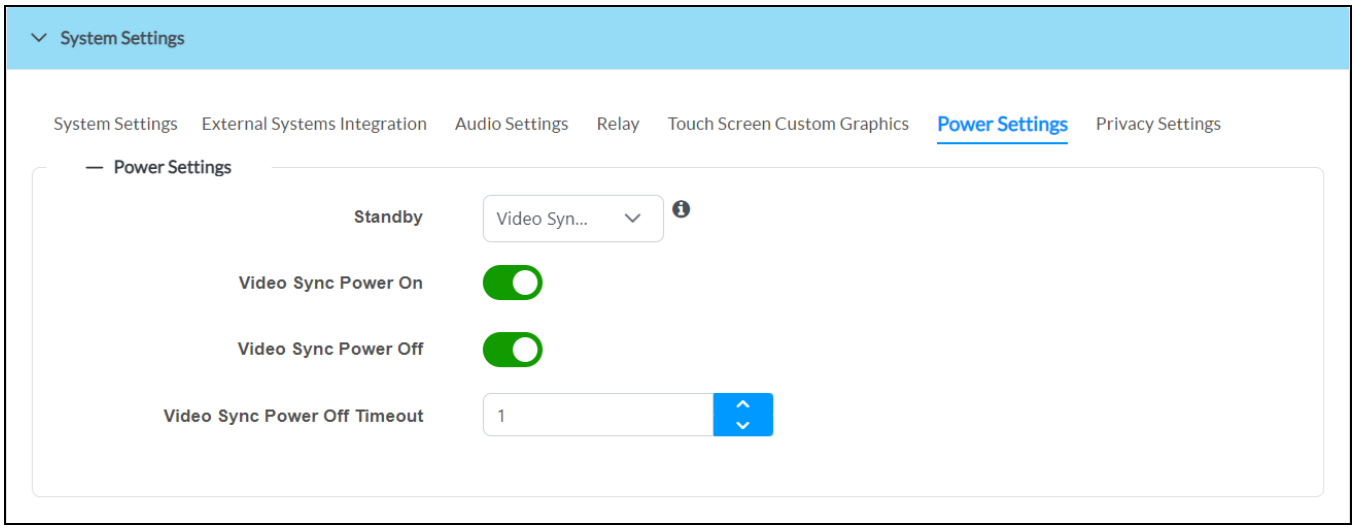
The following settings are displayed if **Occupancy Based** is selected for **Standby**. Refer to the previous image.

- **Occupancy Power On**: Turn on the toggle to power on the system when occupancy is detected in the room.
- **Occupancy Power Off**: Turn on the toggle to power off the system when occupancy is no longer detected in the room.

Video Sync Based

The following settings are displayed if **Video Sync Based** is selected for **Standby**.

System Settings Accordion - Power Settings (Video Sync Based)

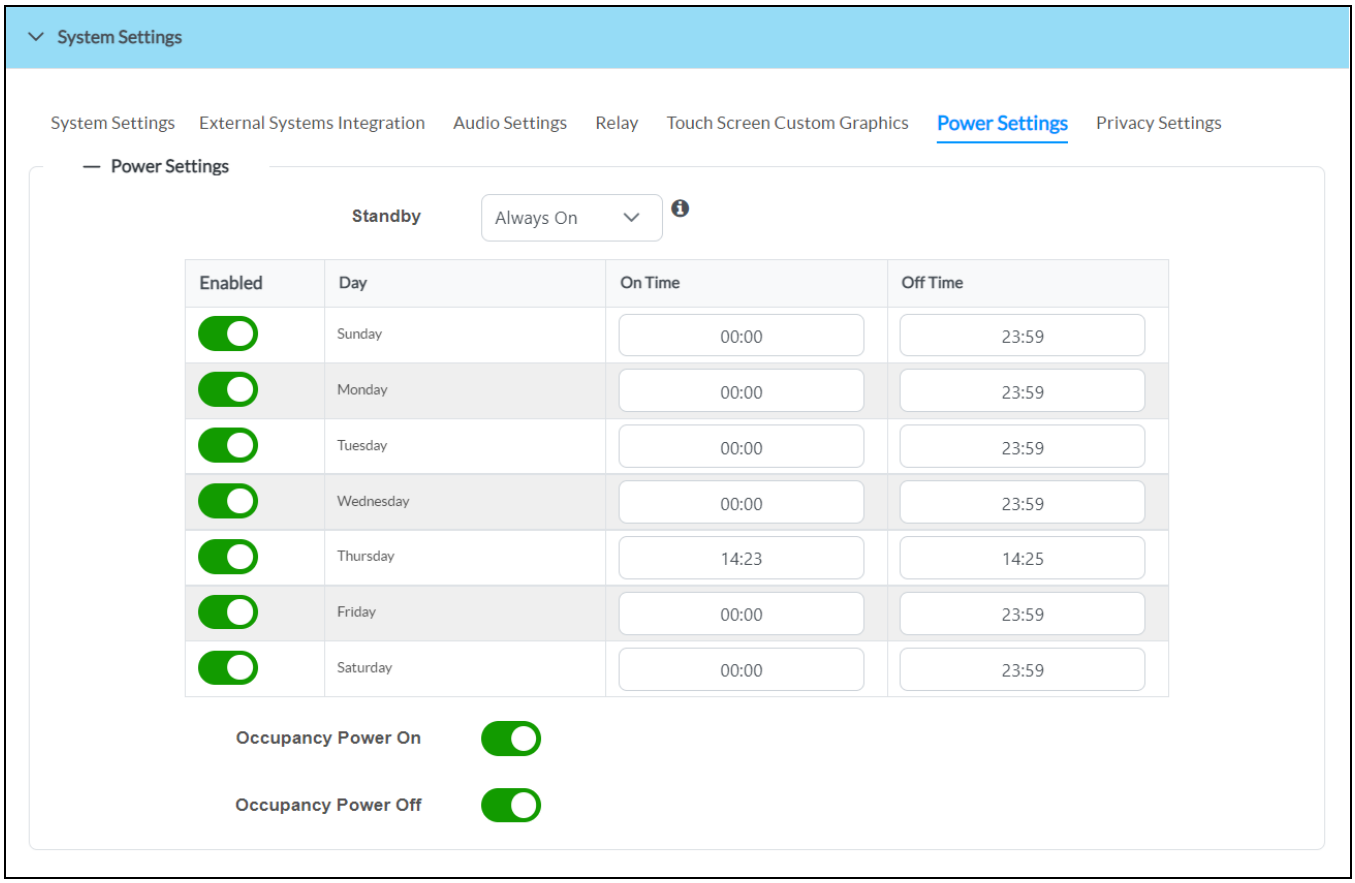


- **Video Sync Power On**: Turn on the toggle to power on the system when a video sync connection is established.
- **Video Sync Power Off**: Turn on the toggle to power off the system when a video sync connection is ended.
- **Video Sync Power Off Timeout**: Enter a duration for the system to power off after an active video sync times out.

Always On

The following settings are displayed if **Always On** is selected for **Standby**.

System Settings Accordion - Power Settings (Always On)



- **Enabled**: Turn on the toggle to use always on power settings for the system on the corresponding day of the week.
- **Day**: The day of the week that corresponds to the always on power settings.
- **On Time**: Select the text field to display pop-up windows for selecting the time that the room will be in the on state.
- **Off Time**: Select the text field to display pop-up windows for selecting the time that the room will be in the off state.
- **Occupancy Power On**: Turn on the toggle to power on the system when occupancy is detected in the room (outside of business hours).
- **Occupancy Power Off**: Turn on the toggle to power off the system when occupancy is no longer detected in the room (outside of business hours).

The system exhibits the following behavior when **Always On** is selected:

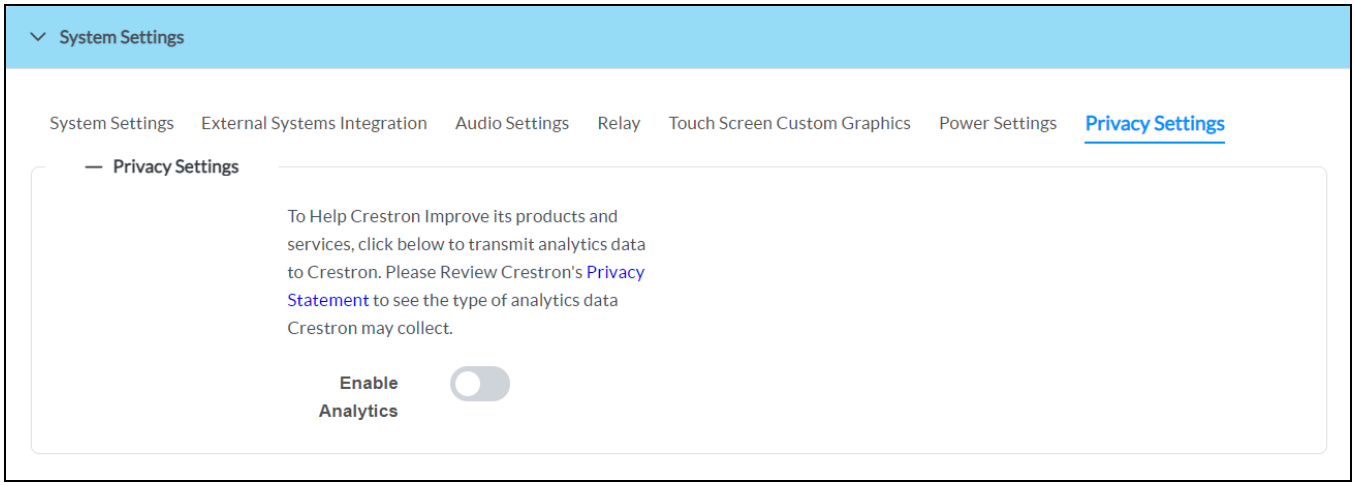
> **NOTE:** To have the .AV Framework system stay on for the entire day, set **On Time** to "0:00" and set **Off Time** to "23:59". If these settings are applied to consecutive days, the system will not power off between days.

- The connected display will be on during the set business hours and days.
- A connected touch screen will always be on with the home screen shown.
- Crestron Fusion power events are not ignored and can still turn the system on or off.
- Occupancy Vacant events will be ignored during business hours.
- Occupancy Occupied events are not ignored during business hours.
- Occupancy events can turn the room on or off outside of business hours.
- Hard button power events are allowed.
- HDMI sync and video route is ignored regardless of business hours.
- The touch screen hard button turns off the room including the display (if controllable).

Privacy Settings

Select the **Privacy Settings** tab in the **System Settings** accordion to configure privacy settings for sending analytics data to Crestron.

System Settings Accordion - Privacy Settings

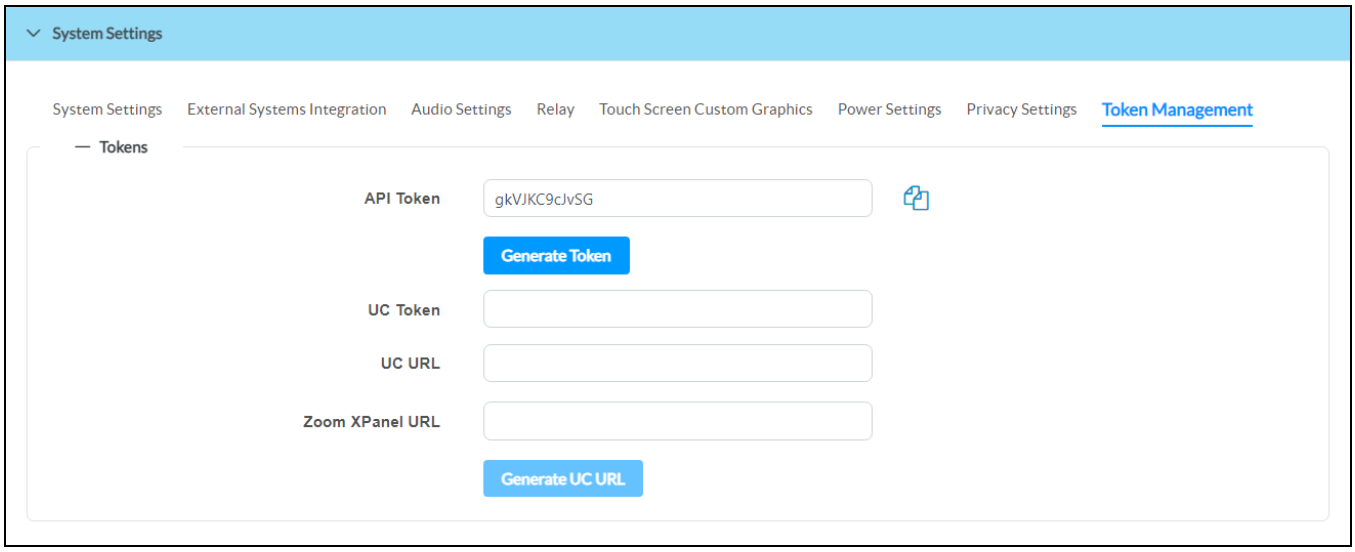


Turn the **Enable Analytics** toggle on or off to opt in or out of having analytics data from your .AV Framework system sent to Crestron to help improve the user experience. As of .AV Framework version 6.24, these settings are initially configured during the first login on a new system or following an upgrade.

Token Management

Select the **Token Management** tab in the **System Settings** accordion to generate tokens and URLs for use with .AV Framework.

> **NOTE:** The **UC Token**, **UC URL**, and **Zoom XPanel URL** fields , as well as the **Generate UC URL** button, are shown only if a UC Web XPanel has been added to the .AV Framework system.



- **API Token**: Generates authorization tokens for use with the .AV Framework API. For more information on using the .AV Framework API, refer to the API for .AV Framework Software Developer Microsite.
    - Select **Generate Token** to generate a new authorization token. The token is generated within the **API Token** field.
    - Select the copy button next to the **API Token** field to copy the authorization token to the clipboard.
- **UC URL**: Generates a URL that allows the .AV Framework system to connect to a UC-ENGINE user interface via XPanel.
    - Enter an authorization token generated on the UC-ENGINE device in the **UC Token** field.
    - Select **Generate UC URL** to generate a new URL with the appended token. The URL is generated within the **UC URL** field. The IP ID set for the UC Web XPanel in .AV Framework is appended to the URL.
- **Zoom XPanel URL**: Generates a URL that allows the .AV Framework system to connect to the Crestron Control for Zoom Rooms® Software app via XPanel.

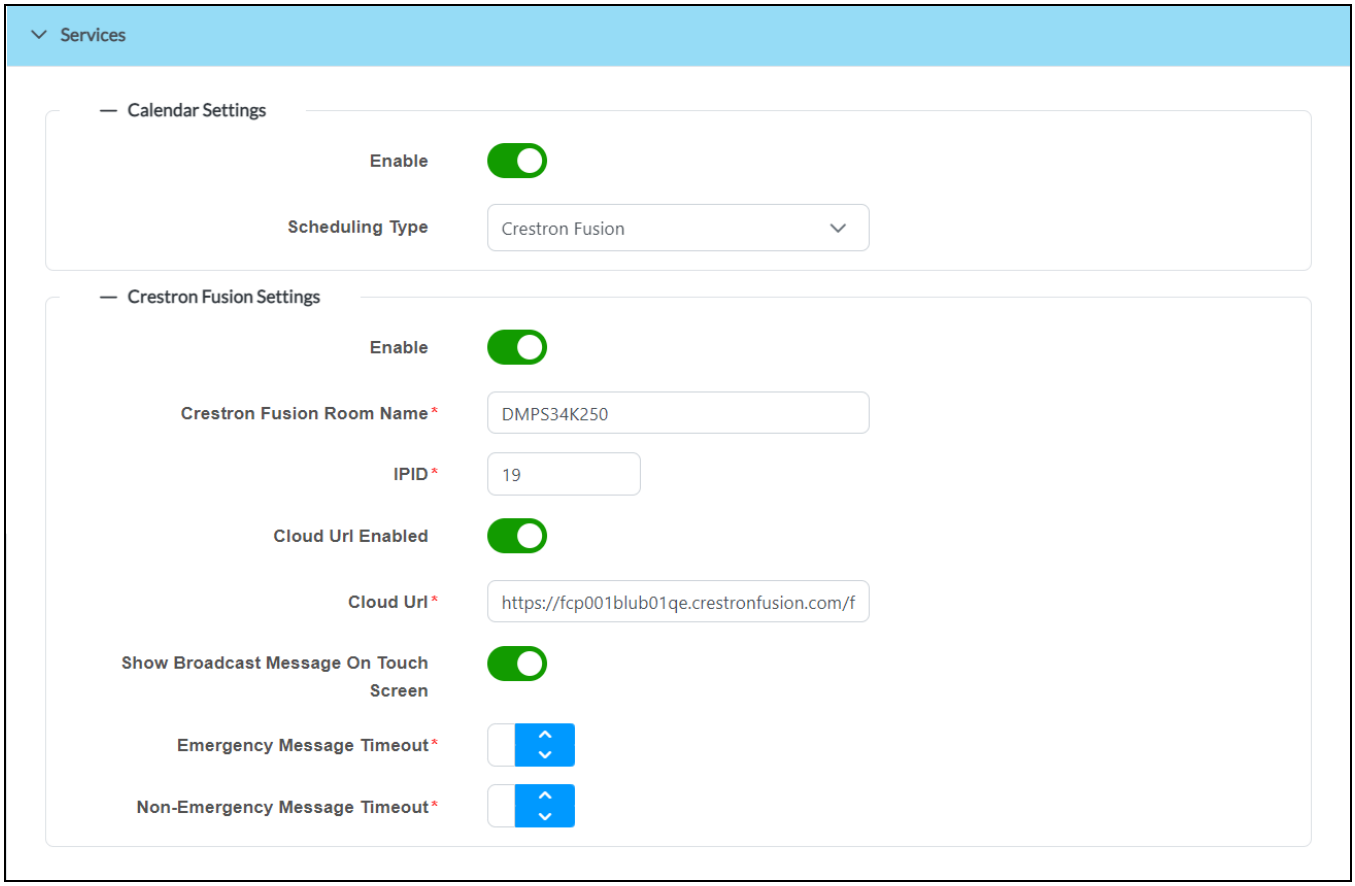
    NOTE: For more information on configuring the Crestron Control for Zoom Rooms Software app and authentication token, refer to the Crestron Control for Zoom Rooms Software Product Manual.

    - Enter an authorization token generated on the control system in the **UC Token** field.
    - Select **Generate UC URL** to generate a new URL with the appended token. The URL is generated within the **Zoom XPanel URL** field. The IP ID set for the UC Web XPanel in .AV Framework is appended to the URL.

Services

Select the **Services** accordion to configure a connection to Crestron Fusion® software and other scheduling calendars.

Services Accordion



The following **Services** settings are displayed.

Calendar Settings

Select the **+** (plus) icon next to **Calendar Settings** (if the section is not already expanded) to display the following scheduling calendar settings:

Services Accordion - Calendar Settings (Crestron Fusion)



- **Enable**: Turn on the toggle to turn on a connection to the chosen scheduling calendar.
- **Scheduling Type**: Use the drop-down menu to select one of the available scheduling calendar providers.
    - **Crestron Fusion**
    - **Exchange/O365**
    - **Google**

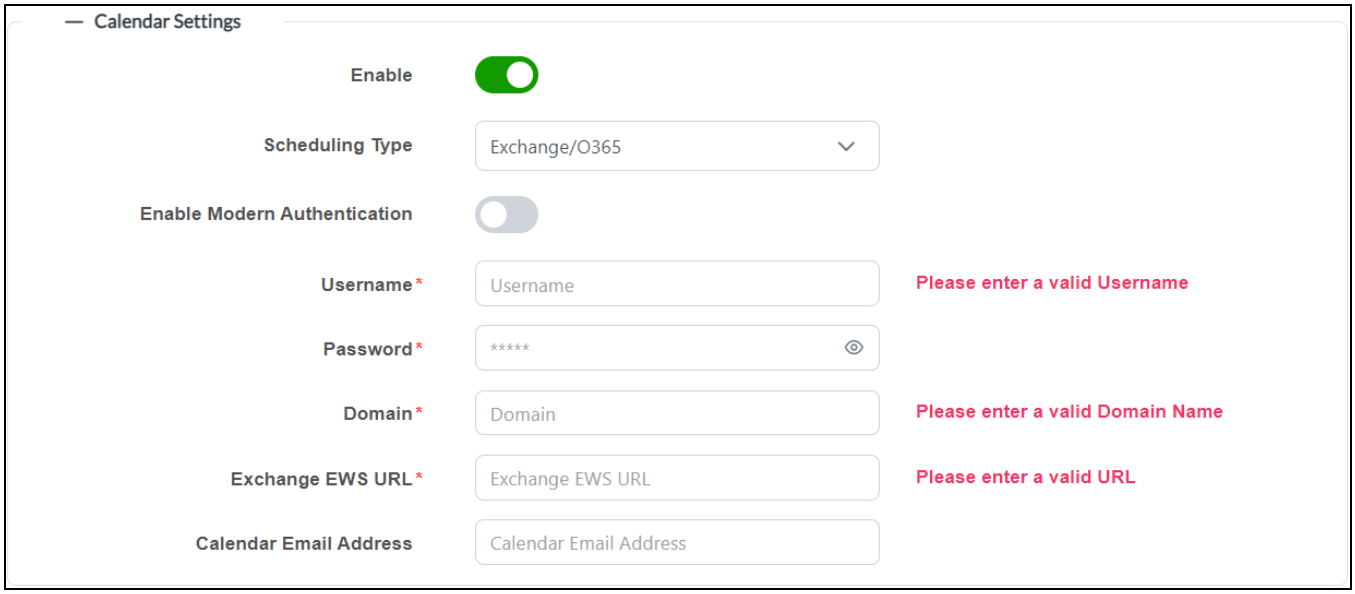
Additional settings are displayed depending on the chosen scheduling calendar provider.

> **NOTE: Crestron Fusion** can only be selected if the **Enable** toggle is turned on within the Crestron Fusion Settings section.

Exchange/O365

Select **Exchange/O365** for **Scheduling Type** to connect a Microsoft® Exchange scheduling calendar via a Microsoft Office 365® account to .AV Framework.

Services Accordion - Calendar Settings (Exchange/O365)



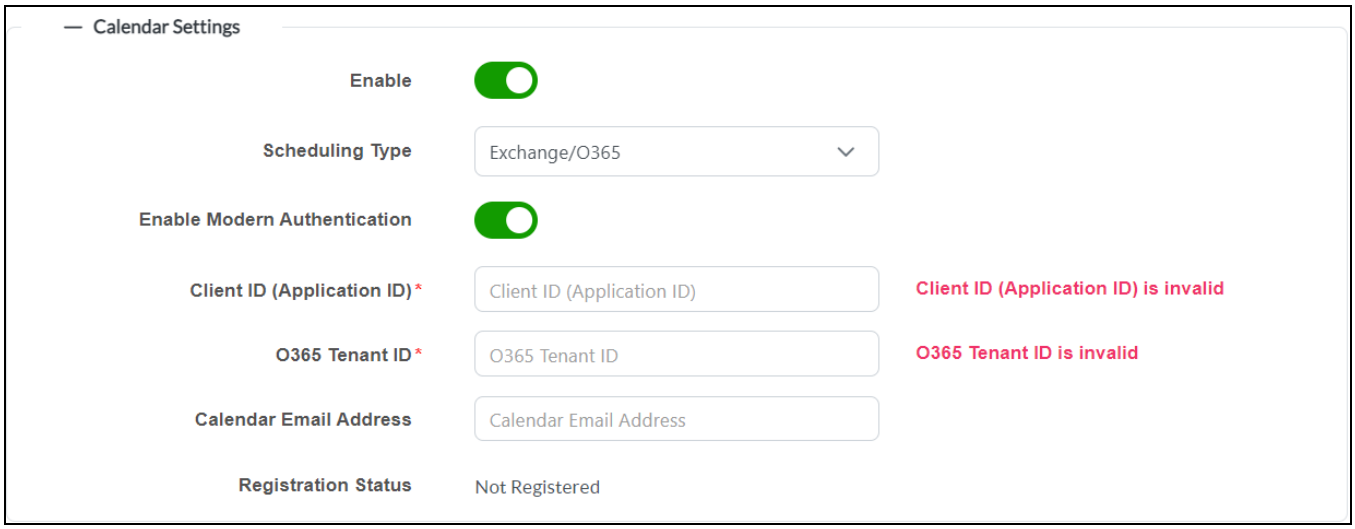
The following settings are displayed:

- **Enable Modern Authentication**: Turn on the toggle to use Modern Authentication for the Office 365 account. For instructions on configuring Modern Authentication for use with the .AV Framework system, refer to Appendix E: Configuring Modern Authentication for EWS on page 162.
- **Username**: Enter the username for the Office 365 account.
- **Password**: Enter the password for the Office 365 account.
- **Domain**: Enter the domain name associated with the Office 365 account.
- **Exchange EWS URL**: Enter the Microsoft EWS (Exchange Web Services) server URL that the scheduling calendar uses to access Microsoft Exchange scheduling data.

- **Calendar Email Address**: Enter the email address associated with the Microsoft Exchange scheduling calendar.

If the **Enable Modern Authentication** toggle is turned on, the following settings are displayed instead:

Calendar Settings (Exchange/O365) - With Modern Authentication



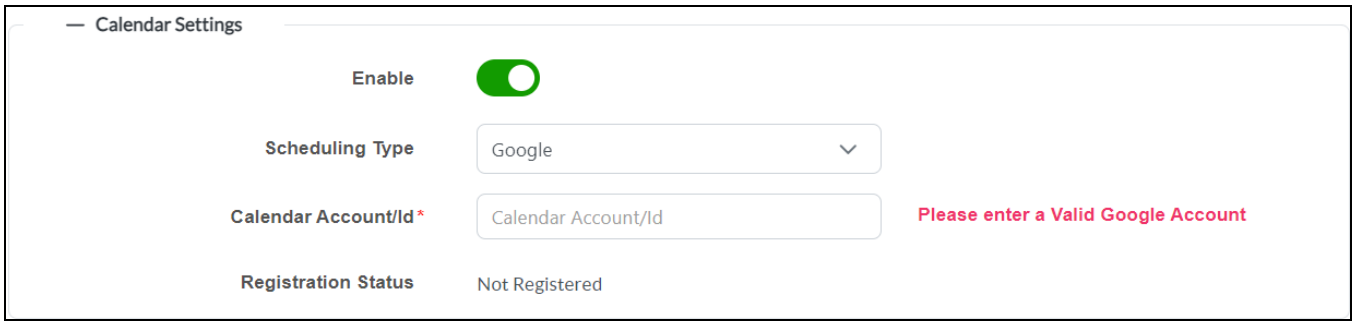
- **Client ID (Application ID)**: Enter the client ID created for the .AV Framework application in the Azure® Active Directory® service.
- **O365 Tenant ID**: Enter the Office 365 tenant ID created for the .AV Framework application in the Azure Active Directory service.
- **Calendar Email Address**: Enter the email address associated with the Microsoft Exchange scheduling calendar.
- **Registration Status**: Shows the current registration status for the Office 365 account.

Once the Modern Authentication settings have been saved and the new configuration is activated, a **Register** button is displayed for pairing the Office 365 account with .AV Framework. For more information, refer to Appendix E: Configuring Modern Authentication for EWS on page 162.

Google

Select **Google** for **Scheduling Type** to connect a Google Calendar™ scheduling calendar via a Google® account to .AV Framework.

Services Accordion - Calendar Settings (Google)



The following settings are displayed:

Calendar Account/Id: Enter the calendar account name or ID if more than one calendar is available for the Google account. If this field is left empty, the scheduling application uses the primary calendar set for the Google account.

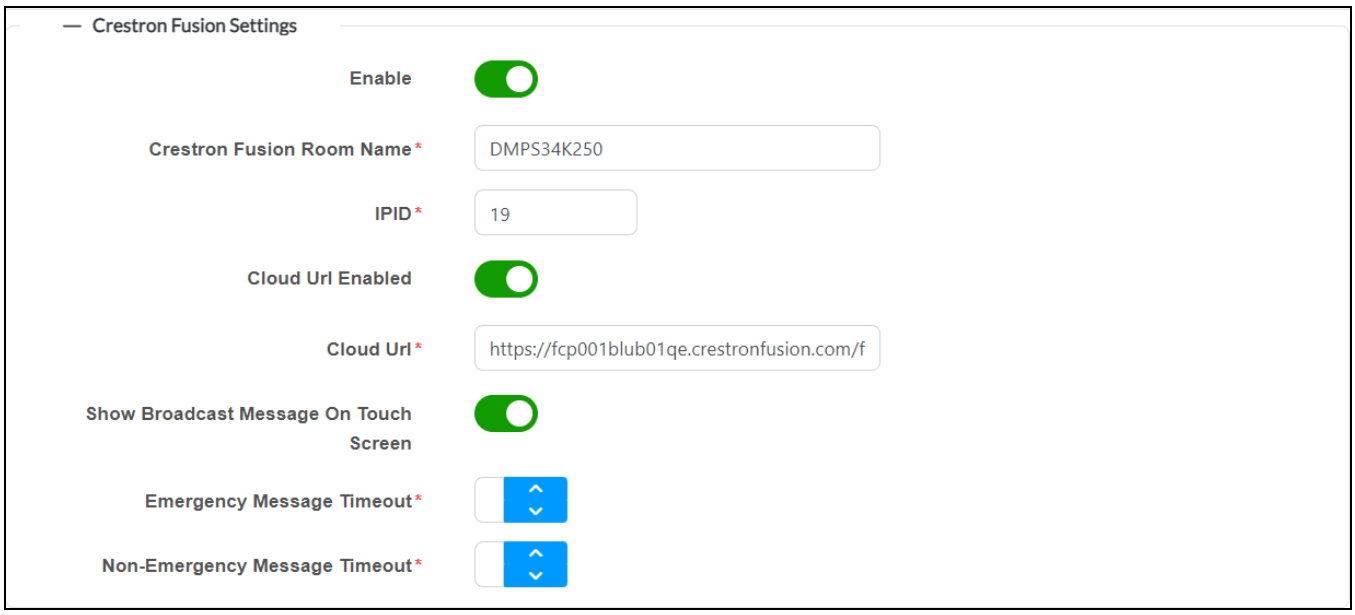
- **Registration Status**: Shows the current registration status for the Google account.

Once the Google settings have been saved and the new configuration is activated, a **Register** button is displayed for pairing the Google account with .AV Framework.

Crestron Fusion Settings

Select the **+** (plus) icon next to **Crestron Fusion Settings** (if the section is not already expanded) to display the following Crestron Fusion settings:

Services Accordion - Crestron Fusion



The following settings are displayed:

> **NOTE:** The Crestron Fusion server URL is set through the **System Setup** section of the Crestron Virtual Control web interface. For more information, refer to the embedded Crestron Virtual Control help file.

- **Enable**: Turn on the toggle to turn on a connection to Crestron Fusion.
- **Crestron Fusion Room Name**: Enter the room name in Crestron Fusion associated with the .AV Framework system.
- **IPID**: Enter the IP ID of the selected Crestron Fusion room.
- **Crestron URL Enabled**: Turn on the toggle to display a field for entering the URL of the Crestron Fusion server.
- **Cloud URL**: Enter the URL of the connected Crestron Fusion server.

- **Show Broadcast Message on Touch Screen**: Turn on the toggle to show broadcast messages from Crestron Fusion on a touch screen.
- **Emergency Message Timeout**: Enter the time, in minutes, it takes for an emergency broadcast from the Crestron Fusion server to time out.
- **Non-Emergency Message Timeout**: Enter the time, in minutes, it takes for a nonemergency broadcast from the Crestron Fusion server to time out.

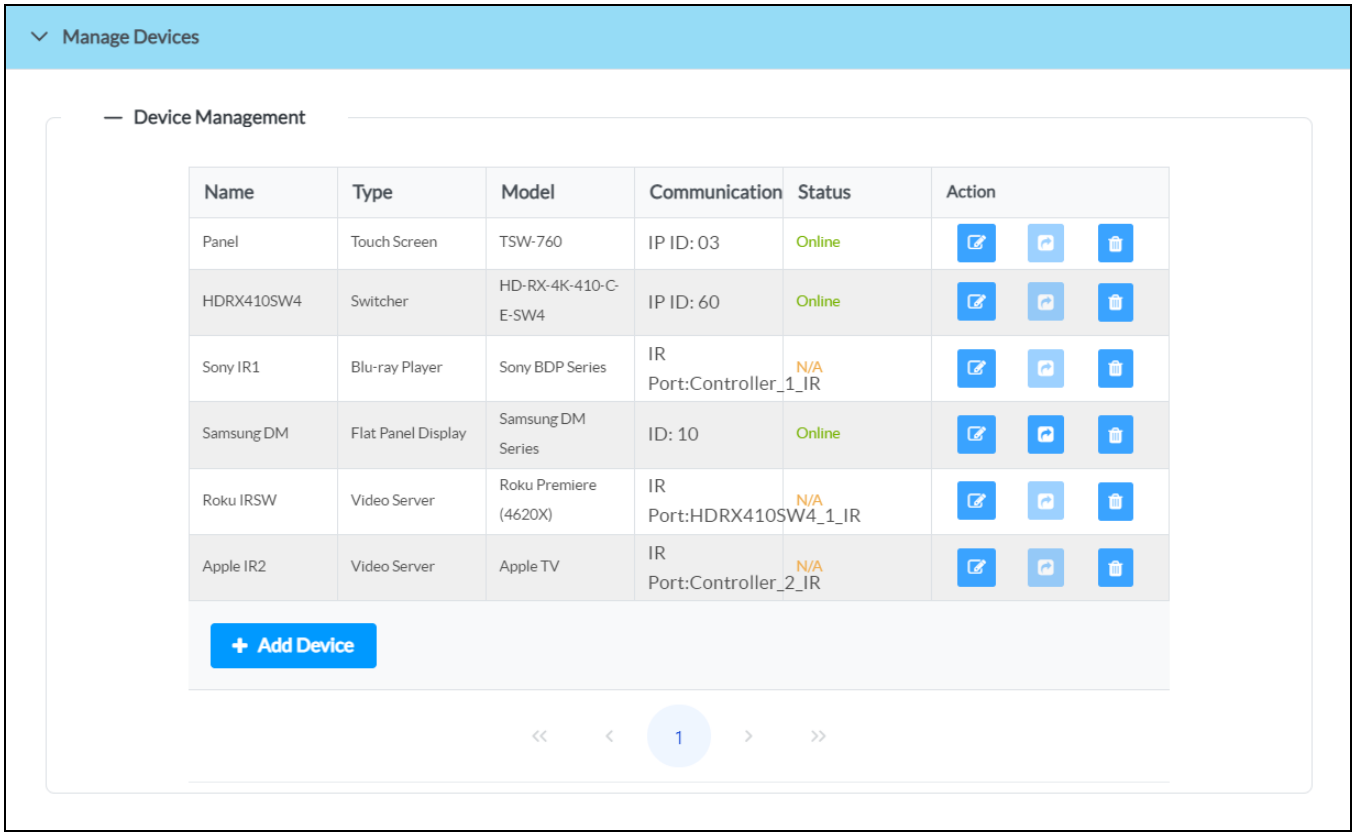
For more information about connecting .AV Framework to Crestron Fusion, refer to Connect to Crestron Fusion on page 132.

> **NOTE:** .AV Framework for Crestron Virtual Control supports only inbound communications for connecting to a Crestron Fusion Cloud server. Traditional (outbound) communications for connecting to an on-premises server are not supported.

Manage Devices

Select the **Manage Devices** accordion to add a device to the .AV Framework system, to view information about connected devices, and to edit or remove a device.

Manage Devices Accordion



The **Manage Devices** accordion lists all devices that have been added to the .AV Framework system in table format. The following information is provided for each device:

- **Name**: The user-defined device name.
- **Type**: The device type.
- **Model**: The device model.
- **Communications**: The communication protocol used by the device.
- **Status**: The device status:
  - **Online**: The device is detected and is providing feedback to .AV Framework.
  - **Offline**: The device was detected at one point, but it is no longer detected by .AV Framework.
  - **N/A**: The device status is not reported (shown for CEC-controlled displays, non-controlled displays, and IR-controlled devices.
  - **Requires Configuration**: The device still needs additional configuration before it can be used in the .AV Framework system.
- **Action**: Select the provided buttons to edit, test (if applicable), or delete the device.

Observe the following points when managing devices in .AV Framework:

- Certain device classes limit the number of devices that can be added to the system. Once the maximum number of devices have been added to the system, the devices within that class can no longer can be selected from the **Add Device** dialog box.
- Before adding a device to .AV Framework, the chosen device should be connected to the connected A/V switcher. For more information, refer to Appendix A: Interface Setup on page 117.
- Be sure to select the correct device model when adding a device via an IP connection, and confirm that the IP ID is assigned to the correct IP device.
- If an AM-300 is selected as the A/V switcher, supported DM® endpoints can be added to the system via an IP ID. Once an endpoint is added, its communication ports are available as additional selections for device transport and control. For a list of supported DM endpoints, refer to Appendix B: Device Configuration on page 141.
- If **Custom Conference Control** is selected for the device type, additional configuration procedures are required outside of .AV Framework. For more information, refer to Appendix D: Configure a Zoom Rooms Controller on page 155, Appendix G: Configure Cisco Touch 10 Custom Conferencing on page 182, Appendix H: Configure Microsoft Teams Custom Conferencing on page 190, or Appendix I: Configure Google Meet Custom Conferencing on page 194.

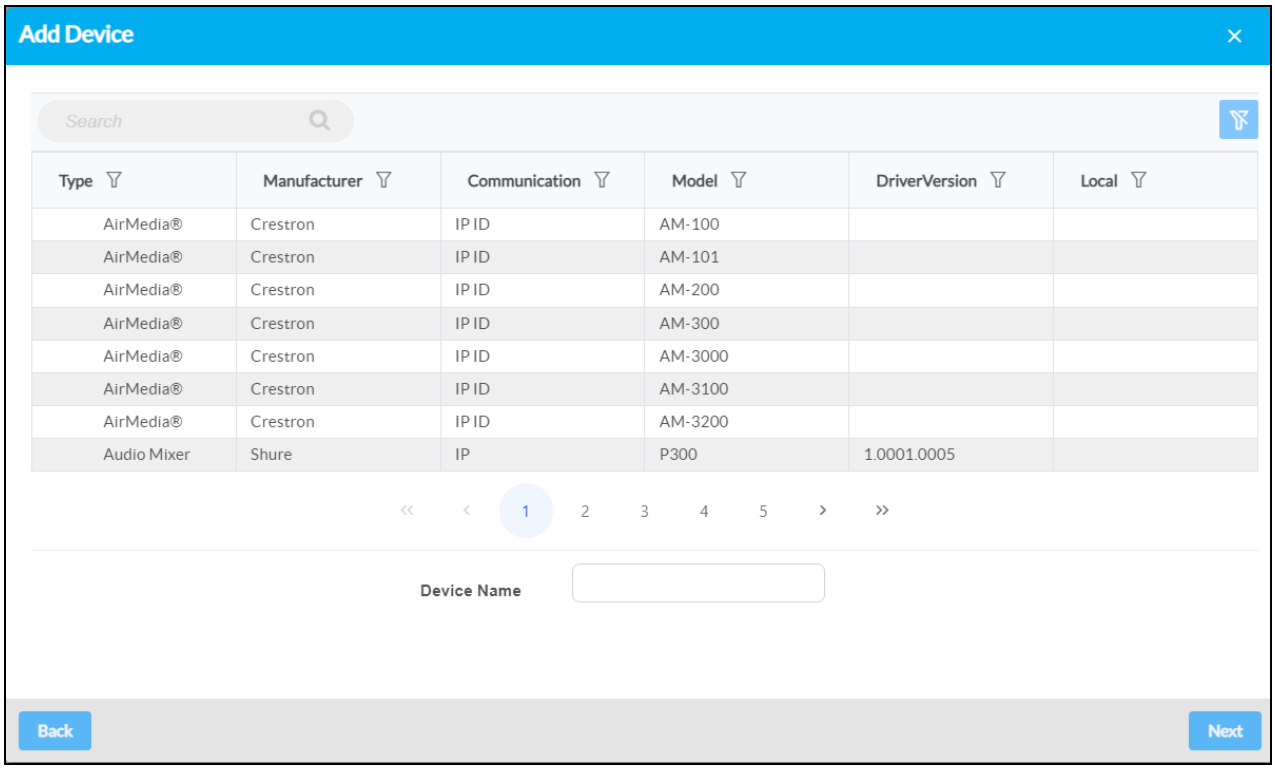
Add a Device

To add a new device to the .AV Framework system:

1. Select **+ Add Device**. The **Add Device** dialog box is displayed.

   > **NOTE:** For new installations, a compatible switcher device must be added to the system before any other devices can be added. For more information, refer to Add an A/V Switcher on page 22.

Add Device Dialog Box



All available device models are provided in table format that provides the following information:

- **Type**: The device type.
  - A dollar icon $ is shown to the left of the device type if the corresponding device model uses a paid driver.
  - A Crestron swirl icon is shown to the left of the device type if the corresponding device model uses a driver that has been tested and validated by Crestron.
- **Manufacturer**: The device manufacturer.
- **Communication**: The communication protocol used to connect the device to .AV Framework.
- **Model**: The device model.
- **Driver Version**: The version of the device driver (if applicable).
- **Local**: If the device driver corresponding to the device has been loaded manually to .AV Framework, a disk icon is shown

2. Navigate to and select the desired device model in the provided table.
   - Use the **Search** field to only display devices matching the provided search term(s).
   - Use the controls at the bottom of the table to navigate through the available models.
   - Use the filter controls in each table header to filter the table data. Select the filter clear button to clear any filter data that is retained.
3. Enter a descriptive name for the device in the **Device Name** text field.
4. Select **Next**. Additional information and settings (if applicable) for the device are displayed.

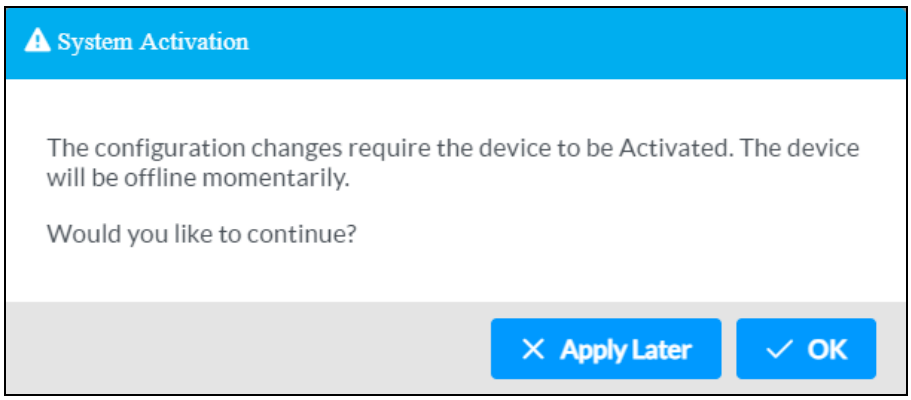
   NOTE: If a third-party device was selected, its driver is imported from the cloud and installed into the .AV Framework system automatically.

5. Enter any additional settings for the device in the appropriate fields (if required), including the transport control details.

   NOTES:

   - Certain device types and models require additional information to be entered (such as setting transport control details). Additional drop-down menus and text fields are provided when these device types and/or models are selected. For a complete list of additional fields, refer to Appendix B: Device Configuration on page 141.
   - Certain device drivers require custom configuration parameters—such as a screen ID, MAC address, or passcode—for connection. The **Add New Device** dialog box provides an information icon next to custom parameters that explains how to configure them. Some drivers also include a **Configuration Instructions** section that provides detailed setup instructions for the device.

6. Select **Save**. If required by the device, a **System Activation** dialog box is displayed asking whether the room should be activated.



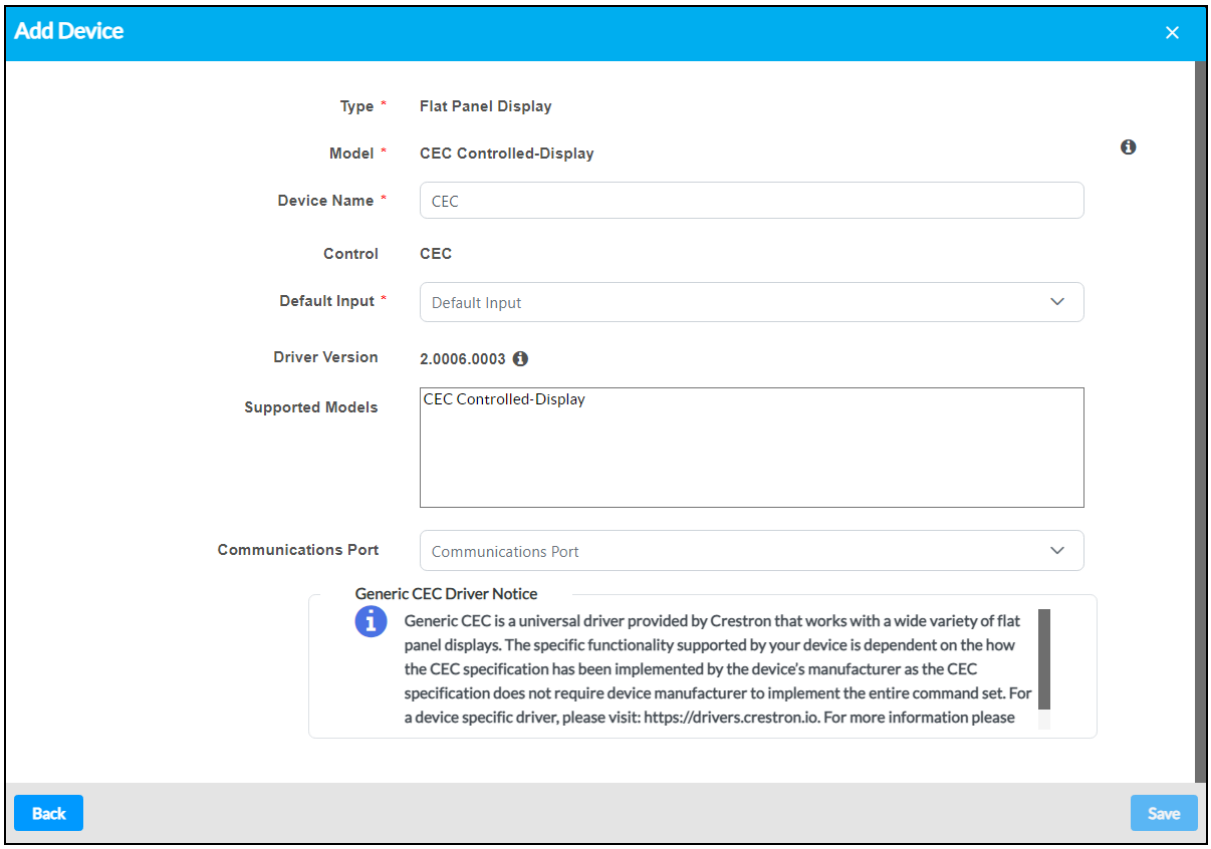
7. Select **OK**. The room goes offline to begin the activation process.

The device is added to the list of devices on the **Manage Devices** accordion.

Add CEC and Crestron Connected Devices

When adding a CEC-controlled device or a Crestron Connected® device is added, a notice is displayed within the **Add Devices** dialog box that should be reviewed prior to adding the device. The notice for CEC drivers is shown below as an example.

Add Device Dialog Box - Generic CEC Driver Notice

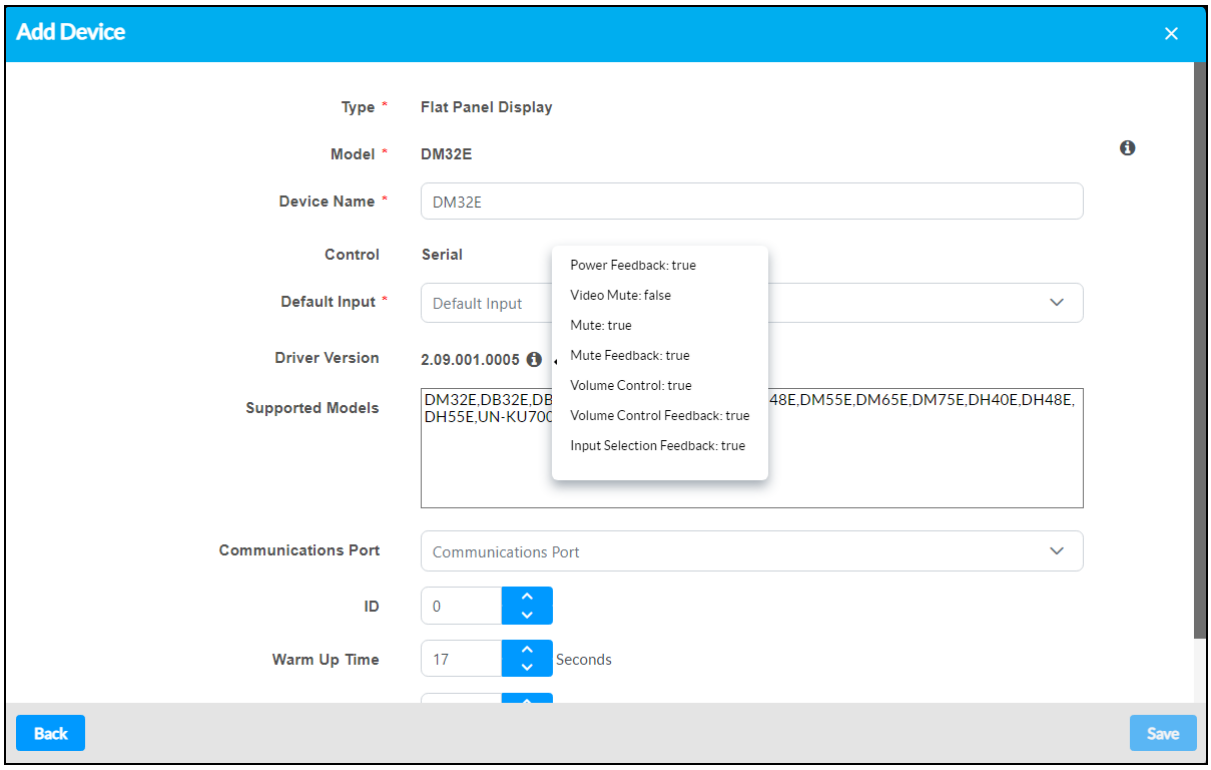


Add Flat Panel Displays or Projectors

Supported driver features are provided after selecting the projector or display model in the **Add Device** dialog box. Hover over the information icon ⓘ next to the driver version to display the supported driver features.

> **NOTE:** Certain device drivers require a username and password to initiate control communications. Additional **User Name** and **Password** fields are provided in the **Add Device** dialog box for these devices. These fields are required or optional depending on the device driver.

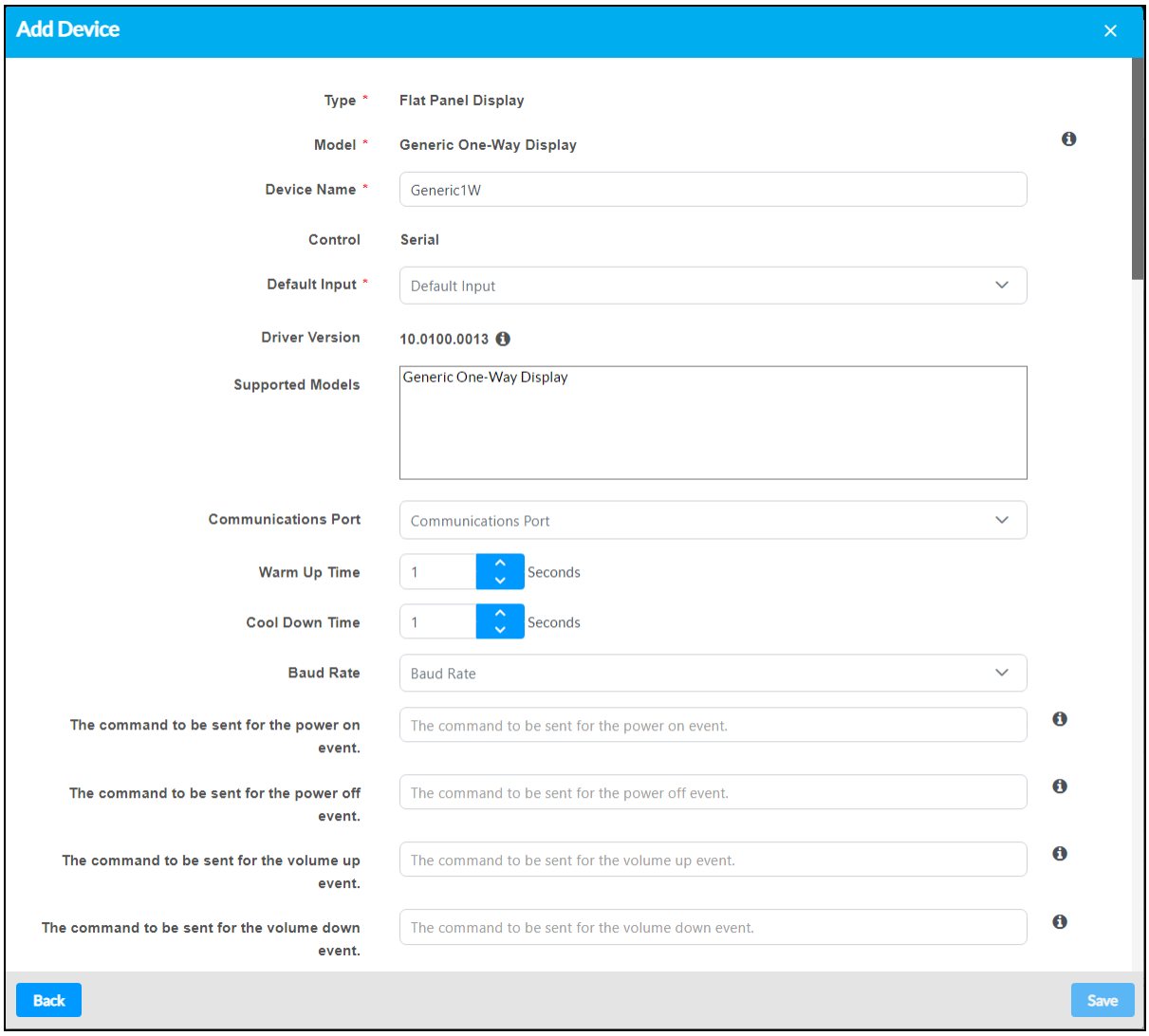
Add Device Dialog Box - Flat Panel Displays and Projectors (Driver Features)



Add Generic Serial Drivers (Flat Panel Displays)

If a particular serial driver for a flat panel display device is not available from the Crestron Drivers portal, **Crestron Generic One-Way** can be selected for the device model using the **Add Device** dialog box.

Add Device Dialog Box – Crestron Generic One-Way



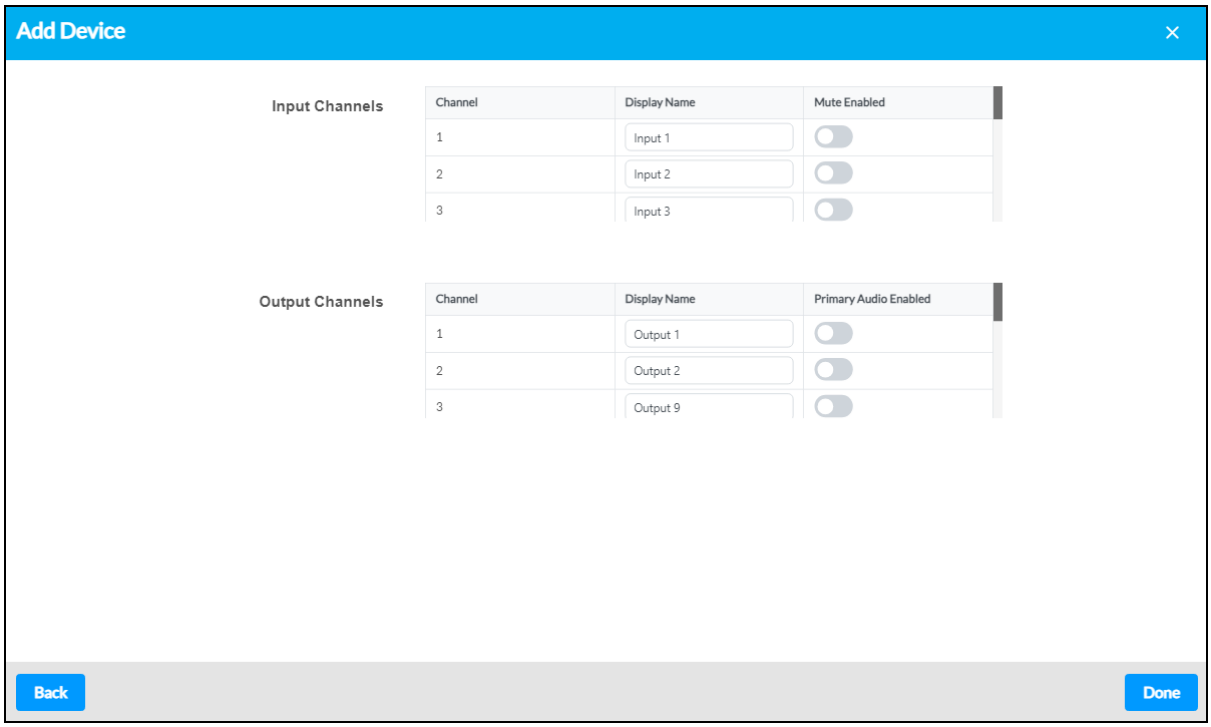
This generic serial driver allows custom API commands to be issued to a device so that it can be integrated within the .AV Framework system. The requisite API commands are commonly found in the manufacturer documentation for the device.

Add an Audio Mixer

As of .AV Framework version 6.27, supported audio mixers can be added to the .AV Framework system.

After selecting the desired device model from the **Add Device** dialog box, enter the required device information, and then select **Next**. Controls for configuring the audio mixer input and output channels are displayed.

Add Device Dialog Box - Audio Mixer Controls



The following settings can be configured for each input channel:

- **Display Name**: Enter a custom name for the input channel. The default input name is populated by the driver.
- **Mute Enabled**: Turn on the toggle to allow the input to be muted from .AV Framework. Any input channel not selected cannot be controlled from .AV Framework.

The following settings can be configured for each output channel:

- **Display Name**: Enter a custom name for the output channel. The default output name is populated by the driver.
- **Primary Audio Enabled**: Turn on the toggle to allow the output mute, volume, and gain settings to be controlled from .AV Framework. Any output channel not selected cannot be controlled from .AV Framework.

> **NOTE:** A maximum of two output channels can be selected for control. Once two output channels are selected, the **Primary Audio Enabled** toggle for all other output channels is grayed out and cannot be selected until an active channel is deselected.

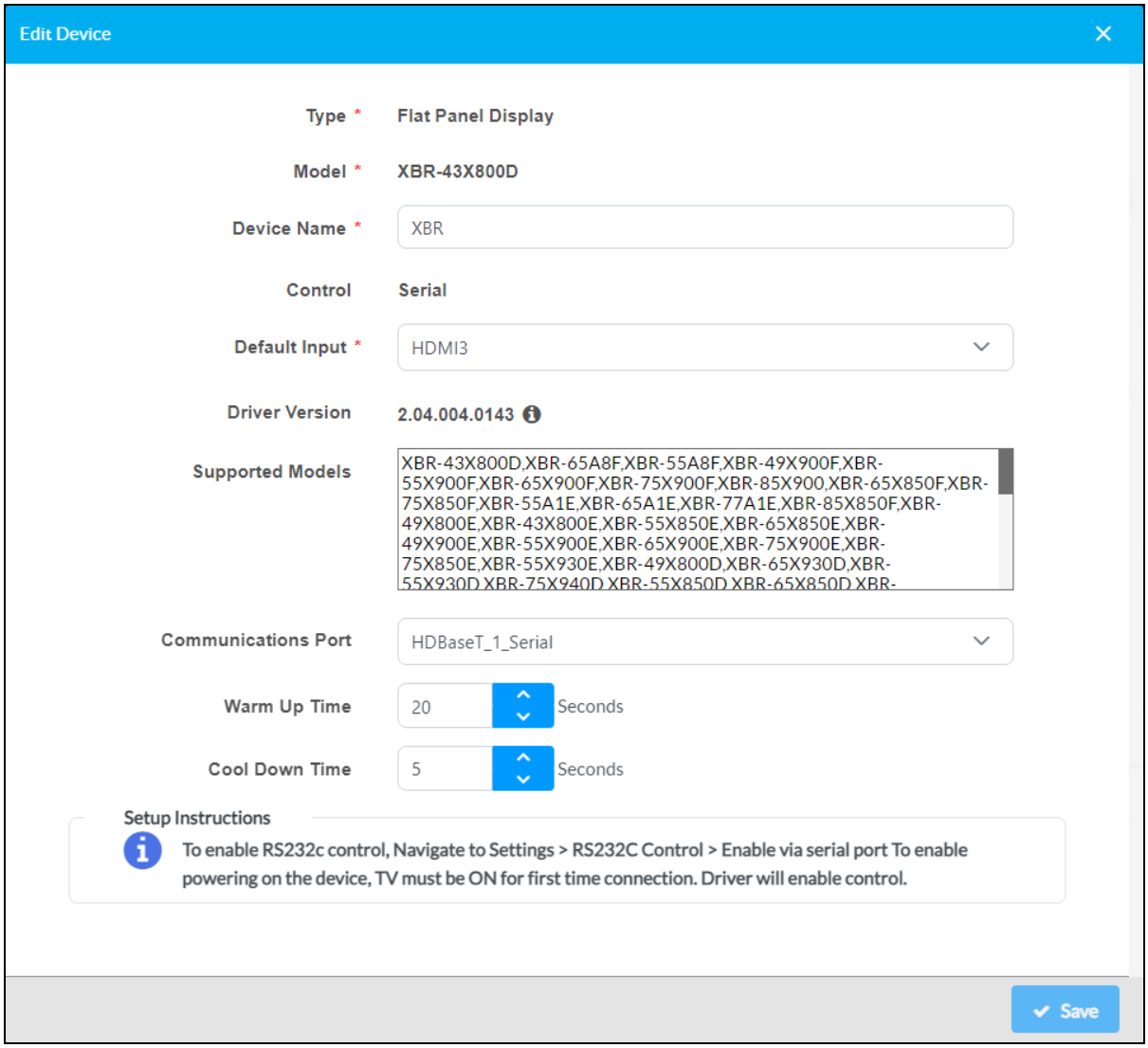
Select **Done** to save the device and return to the **Device Management** page.

Edit a Device

To edit a device that has been added to the **Manage Devices** table:

1. Select the edit button next to a device. The **Edit Device** dialog box opens.

   Edit Device Dialog Box



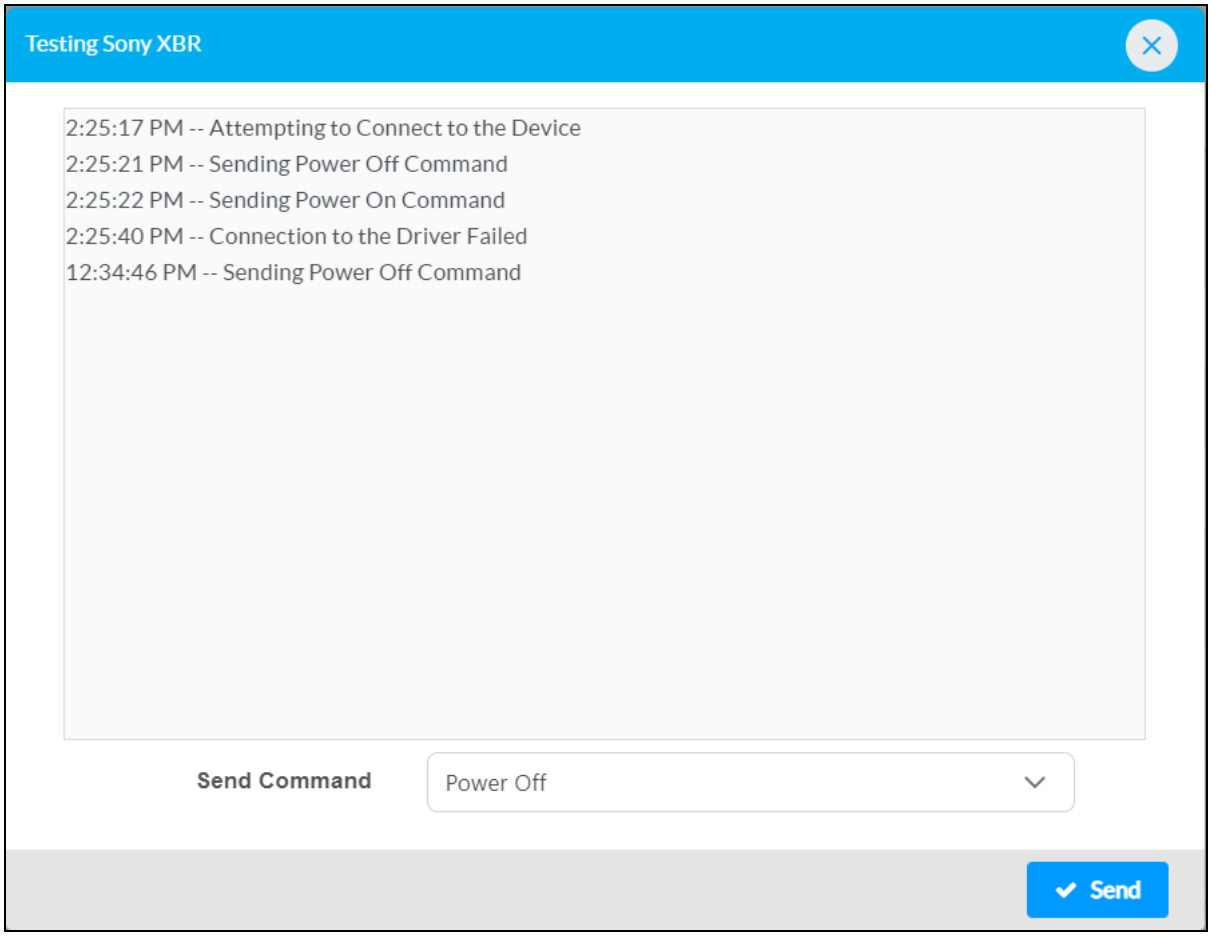
2. Use the **Edit Device** dialog box to edit the display name, transport details, and any other device settings provided for the chosen device.
3. Select **Save** to save any changes or select the **x** button to close the dialog box and to discard any changes.

Test a Device

To test a flat panel display or projector device that has been added to the **Manage Devices** table:

1. Select the test button next to a flat panel display or a projector to send test commands to the device. A dialog box showing the driver test status is displayed.

   Testing Device Dialog Box



2. To send test commands to the device, select a command from the **Send Command** drop-down menu, and then select **Send**. .AV Framework attempts to send the chosen command to the device.

   > **NOTE:** The configuration utility does not provide feedback about whether the command was sent successfully. Verify that the command was received on the device.

Delete a Device

To delete a device that has been added to the **Manage Devices** table:

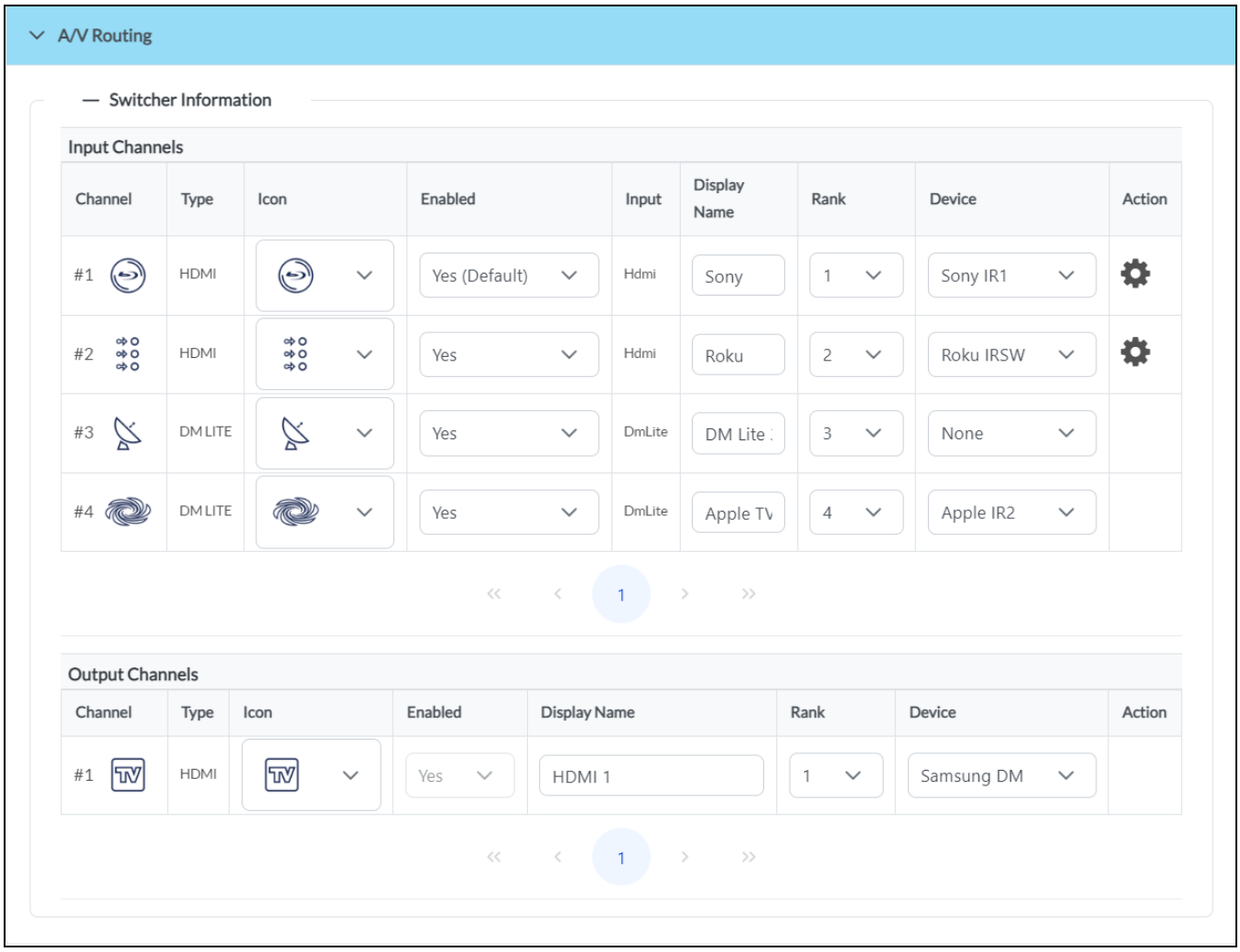
1. Select the trash can button next to a device.
2. A warning message is displayed. Select **OK** to delete the device or **Cancel** to cancel the deletion.

A/V Routing

Select the **A/V Routing** accordion to configure the input and output channels of the controlled switcher device.

> **NOTE:** Up to 15 inputs and 8 outputs are supported by .AV Framework. The available inputs and outputs are based on the selected switcher device.

A/V Routing Accordion



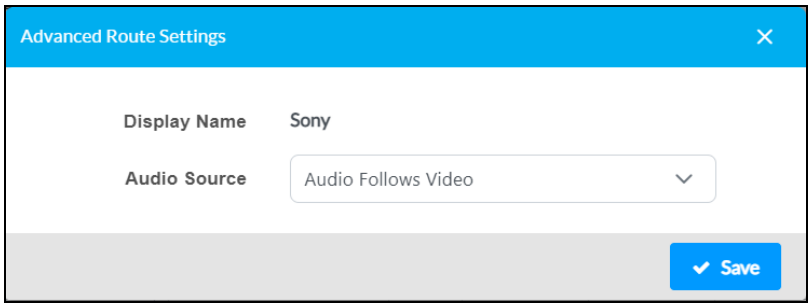
The following information can be viewed and configured for each input and output channel unless otherwise noted.

> **NOTE:** When using a HD-RX-4K-210-C-E/-POE switcher, the inputs and outputs shown are updated automatically depending on the DM Essentials Transmitter that is selected for the switcher. When using DM NVX devices as a switcher, the inputs and outputs shown are based on the number of configured transmitter and receiver endpoints. For more information, refer to Add an A/V Switcher on page 22.

- **Channel**: This column shows the number of the input or output channel on the switcher device and the chosen icon for that channel.
- **Type**: This column shows the type of input or output channel (such as HDMI® input or VGA).
- **Icon**: Use the drop-down menu to select an icon for the channel.
- **Enabled**: Use the drop-down menu to turn the channel on or off for the .AV Framework system:
    - Select **Yes** to turn the channel on for the .AV Framework system. Channels are turned on by default. A channel that is turned on can be selected from the source routing page in the touch screen user interface.
    - Select **No** to turn the channel off for the .AV Framework system. A channel that is turned off is hidden from the source routing page.
    - Select **Yes (Default)** to turn the channel on and to make it the default source route for the .AV Framework system. This channel will be selected by default on the source routing page.
- **Input (Inputs Only)**: This column shows the input name.
- **Display Name**: Enter the display name of the device connected to the channel.
- **Rank**: Use the drop-down menu to select a number to determine the order that the input or output displays appear when selecting a source to present from the touch screen user interface.
- **Device (Inputs Only)**: Use the drop-down menu to select the device connected to the channel. (For more information on adding devices to .AV Framework, refer to Configuration on page 39.)

Select the gear icon ⚙ next to a supported input channel to open the **Advanced Route Settings** dialog box.

Advanced Route Settings Dialog Box



- **Display Name**: The name of the input channel
- **Audio Source**: Sets the audio source behavior for the selected input channel. When selecting an analog audio, the audio of the analog input is mixed with the video and routed to the selected output.
    - **Audio Follows Video**: The audio signal follows the video signal that is routed to the input.
    - **Line 1–2**: The audio source for the selected **Line** input is routed to the input channel.
    - **Aux**: The audio source for the **Aux** input is routed to the input channel.

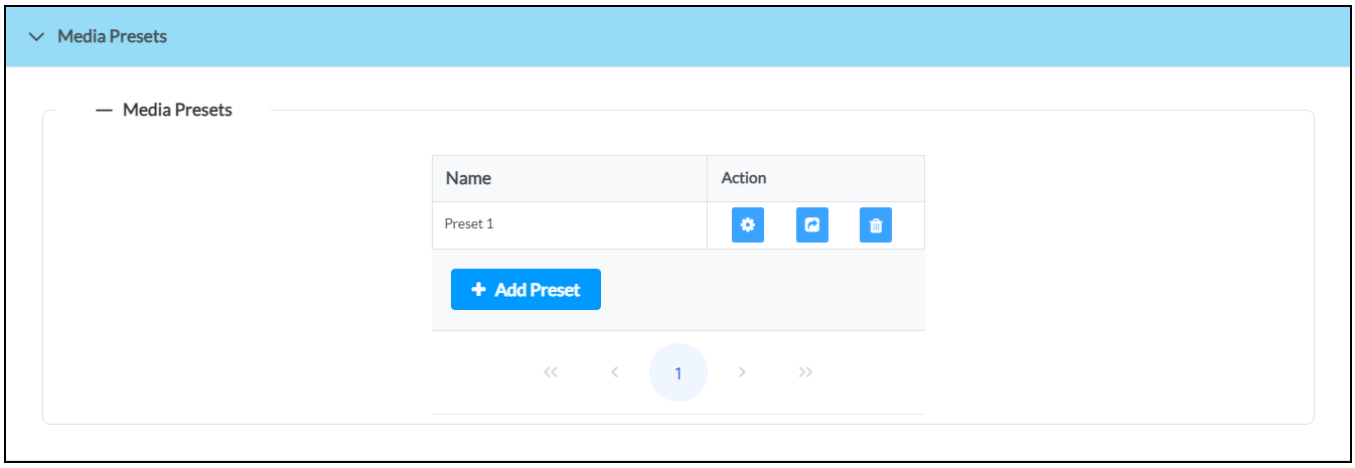
Select **Save** to save any changes or select the **x** button to close the dialog box and to discard any changes.

Media Presets

Select the **Media Presets** accordion to configure media presets for source routing.

> **NOTE:** The **Media Presets** accordion is available only if using an A/V switcher that supports multiple outputs.

Media Presets Accordion



Media presets allow users to select common routing configurations within the .AV Framework system from the touch screen project or a connected button panel. For more information, refer to Media Routing Presets Screen Overview on page 111 and MPC3/MP-B10/MP-B20 on page 130.

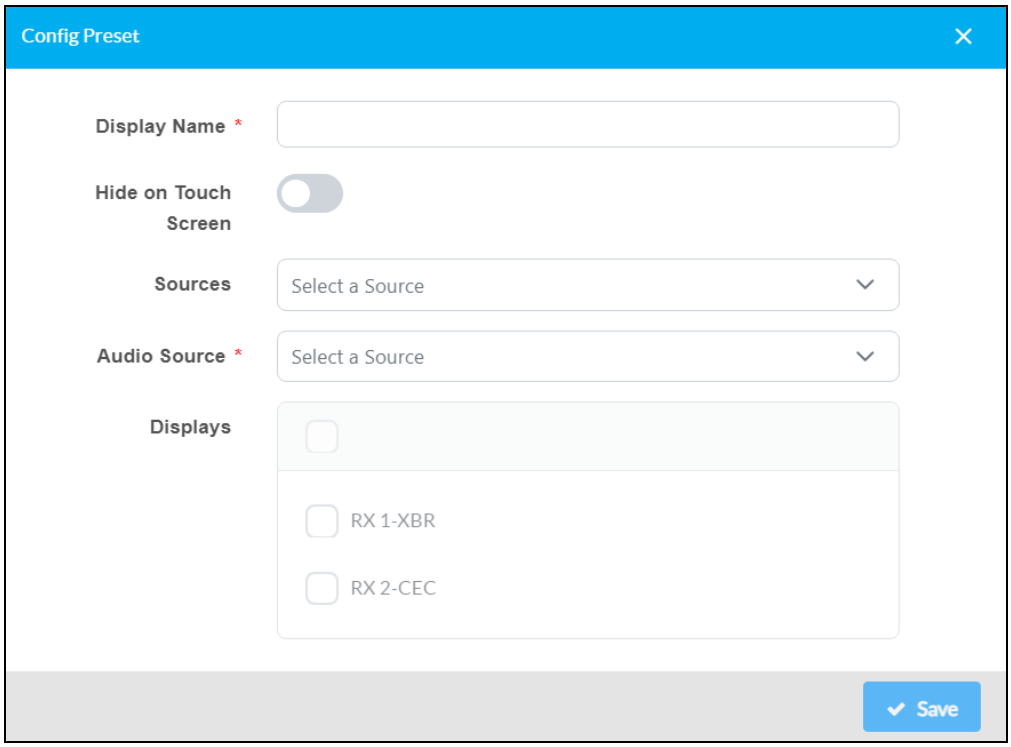
The **Media Presets** accordion lists all media presets that have been added to the .AV Framework system in table format. Up to 9 media presets can be added per system. An **Actions** column provides the following controls for each media preset:

- Select the gear button to edit the media preset.
- Select the test button to recall the media preset in real time.
- Select the trash can button to delete the media preset.

Select **Add Preset** to add a new media preset. The **Config Preset** dialog box is displayed.

> **NOTE:** If the .AV Framework system configuration is changed to only use a single output, no new media presets can be added, and existing media presets cannot be edited until multiple outputs are configured for the system. A message window is shown indicating this issue if media presets have already been added to the system.

Config Preset Dialog Box



Enter the following information for the media preset:

- **Display Name**: Enter a name for the preset that will be displayed in the touch screen project.
- **Hide on Touch Screen**: Turn on the toggle to hide the preset from the touch screen project.

  > **NOTE:** If all media presets in the system are hidden from the touch screen project, then the **Presets** button will not be shown in the touch screen UI.

- **Sources**: Select the video source(s) that will be routed to the selected display(s).
- **Audio Source**: Select the audio source that will be selected for the .AV Framework room.

  > **NOTE:** Audio source selections are limited based on the chosen video source(s) and by how audio routing is configured for the .AV Framework system. For more information, refer to A/V Routing on page 84.

- **Displays**: Fill the check box next to each display that will output the selected video and audio sources.

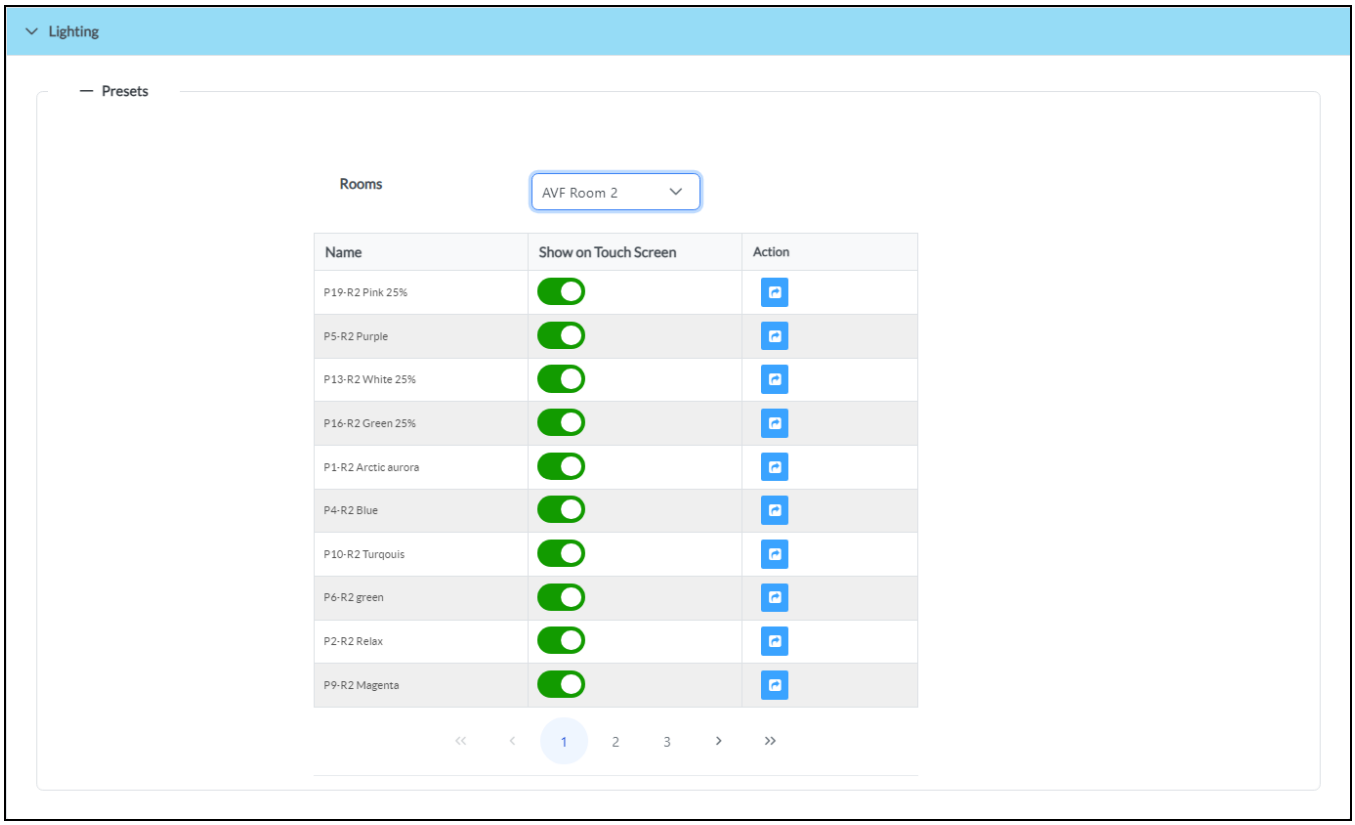
Select **Save**. The new media preset is added to the table in the **Media Presets** accordion.

Lighting

Select the **Lighting** accordion to configure preset lighting scenes for the .AV Framework room.

> **NOTE:** The **Lighting** accordion is available only if a supported platform (lighting) device has been added to the .AV Framework system via a device driver. For more information on adding devices, refer to Manage Devices on page 74.

Lighting Accordion



Lighting presets allow users to select configured lighting scenes on a configured platform device from the touch screen project or a connected button panel. For more information, refer to Lighting Screen Overview on page 112 and MPC3/MP-B10/MP-B20 on page 130.

> **NOTE:** Lighting presets are configured on the platform device and not within .AV Framework. Refer to the documentation for your platform device for more information on configuring lighting presets.

If the platform device supports multiple rooms, select the desired room using the **Rooms** drop-down menu. Only presets for that room will be shown in the configuration interface and on the touch screen project.

> **NOTE:** .AV Framework only supports exposing presets for a single room.

The **Lighting** accordion lists all lighting presets that have been configured on the platform device in table format. The following controls are provided for each lighting preset:

- Turn on the **Show on Touch Screen** toggle to show the lighting preset on the touch screen project. The preset will be hidden from the project if this toggle is turned off.
- Select the test button  in the **Actions** column to recall the lighting preset in real time.

Operation

The .AV Framework touch screen user interface provides a collection of room scheduling and BYOD (bring your own device) presentation capabilities. The various screens that comprise the user interface are described in the sections that follow.

Display Overview

Each screen in the .AV Framework touch screen project provides the following features:

- A status bar that provides the time and date (set using the web-based configuration utility).
- A footer bar that provides buttons for navigation and for controlling the system volume (if supported by the display device or the external amplifier).

The user interface theme can be set to the AVF 3.0 UI (Crestron Construct), AVF 2.0 UI (CH5), AVF 2.0 UI (Smart Graphics), or AVF 1.0 UI (Smart Graphics). All themes except for AVF 3.0 UI are considered legacy themes, and the AVF 3.0 UI is selected by default.

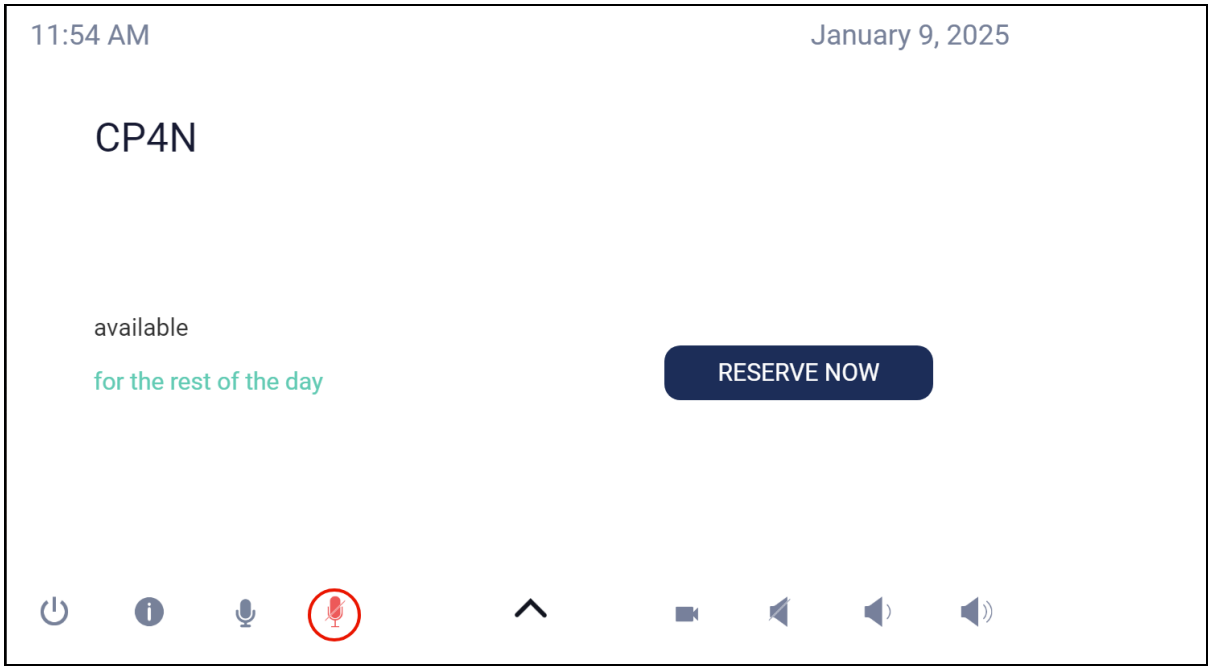
> **NOTE:** The AVF 2.0 UI (CH5) and AVF 3.0 UI (Crestron Construct) themes are not compatible with TSW-52 series touch screens.

For more information on loaded the appropriate ZIP file for the UI theme, refer to Load the Program Files on page 11.

> **NOTE:** The images in this section show the AVF 2.0 UI theme. The same features are provided for the AVF 3.0 UI and AVF 1.0 UI themes, but the layout of some of these features may differ between the themes. Any differences are described in this document.

The following image shows a typical home screen (the project's default page):

Home Screen (Room Available) - Status and Footer Bars



The footer bar provides the same buttons regardless of which screen is selected. Refer to the following tables for more information on footer button functionality.

Navigation Buttons (AVF 1.0 UI)

	The home button navigates to the home screen.
	The present button navigates to the present screen.

Navigation Buttons (AVF 2.0 UI and AVF 3.0 UI)

	The more button navigates to the selection screen.
	The info button navigates to the information screen.
	The microphone button opens the **Microphones** screen (if available). *For AVF 3.0 UI only.*
	The camera button opens the **Room Camera** screen (if available). *For AVF 3.0 UI only.*

Volume Control Buttons (AVF 1.0 UI)

	The microphone mute button turns privacy mute on or off for the system.
	The mute button mutes or unmutes the device volume.
	The volume lower button lowers the device volume incrementally.
	The volume raise button raises the device volume incrementally.

Volume Control Buttons (AVF 2.0 UI and AVF 3.0 UI)

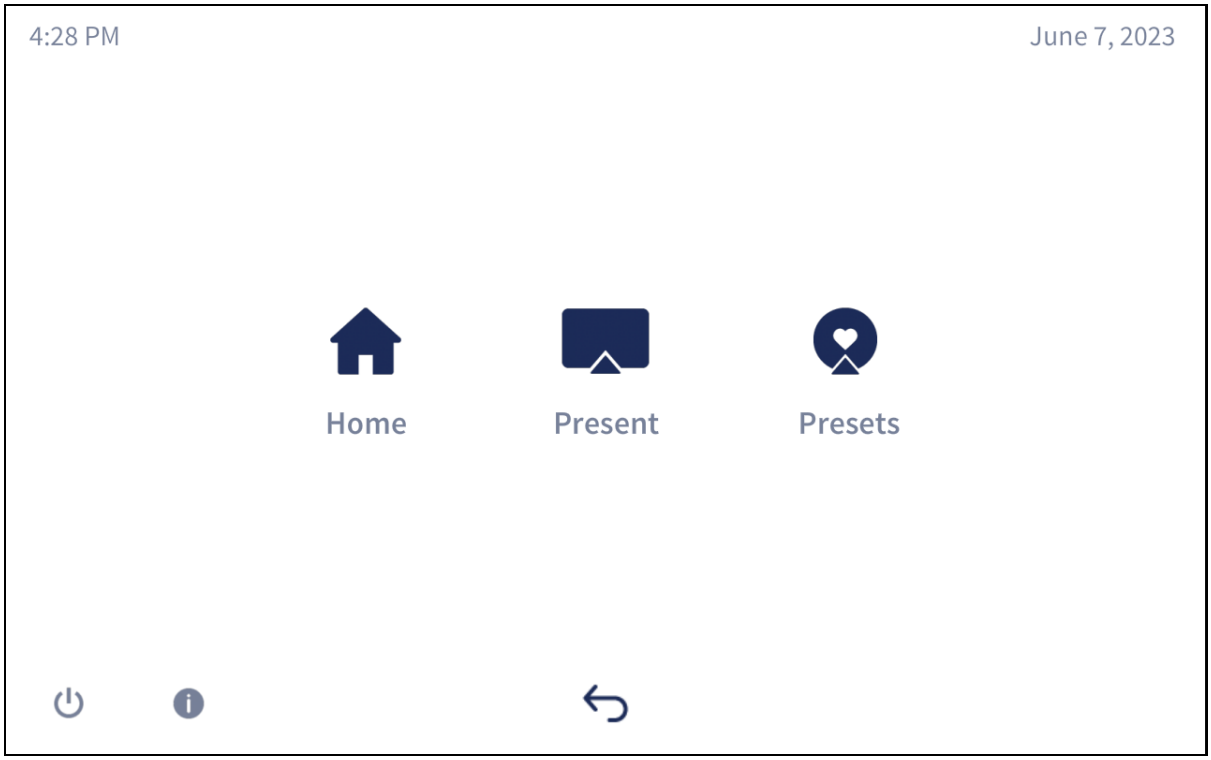
	The microphone mute button turns privacy mute on or off for the system.
	The mute button mutes or unmutes the device volume.
	The volume lower button lowers the device volume incrementally.
	The volume raise button raises the device volume incrementally.

NOTE: The volume control buttons and the volume bar are visible only if the controlled audio output is set to program with the amplifier turned on or set to a display that supports volume control. For more information, refer to System Settings on page 54.

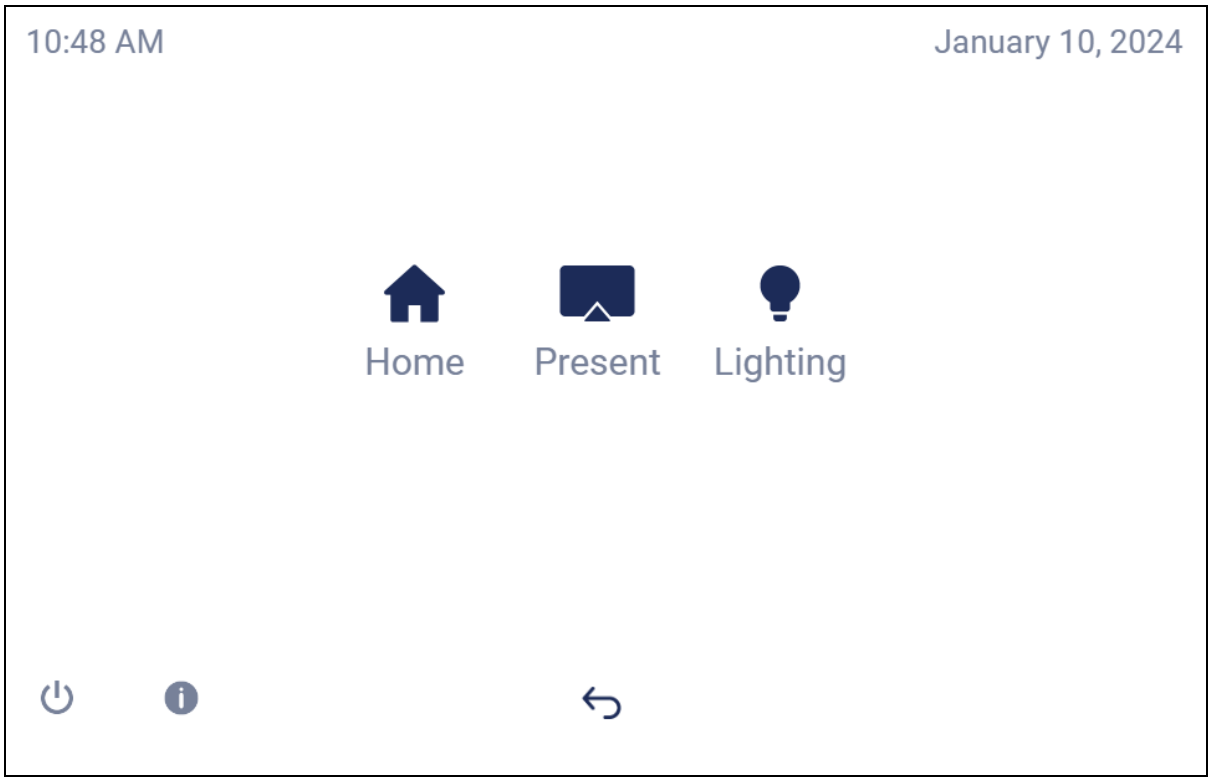
Selection Screen

Tap the more button ^ on the footer bar to display the selection screen.

Selection Screen Example (AVF 2.0 UI)



Selection Screen Example (AVF 3.0 UI)



This screen is used to navigate to various screens in the user interface:

- Tap **Home** to navigate to the home screen.
- Tap **Present** to navigate to the present screen.
- Tap **Presets** to navigate to the media presets screen.
- Tap **Lighting** to navigate to the lighting presets screens.

  > **NOTE:** The **Presets** button is shown only if media presets have been configured for the .AV Framework system and are not hidden from the touch screen project. The **Lighting** button is shown only if lighting presets have been configured for the .AV Framework system and are not hidden from the touch screen project. For more information, refer to Media Presets on page 86 and Lighting on page 88.

- Tap the back button to return to the previous screen.

Home Screen Overview

The home screen is the default screen of the touch screen project. The home screen indicates whether the associated room is either available or reserved for meetings (if .AV Framework is connected to a scheduling calendar):

- If the room is available, the home screen allows an ad hoc meeting to be reserved from the touch screen.
- If the room is reserved, the home screen shows current meeting information and the time remaining in the meeting.

If .AV Framework is not connected to a scheduling calendar, the home screen shows a custom logo (if turned on) or the date and time and provides a button that is used to switch to the system's default route.

The home screen can be accessed at any time by tapping **Home** on the selection screen (AVF 2.0 UI and AVF 3.0 UI) or by tapping the home button  on the footer bar (AVF 1.0 UI).

No Scheduling Calendar Connected

If .AV Framework is not connected to a scheduling calendar, the home screen provides the following information:

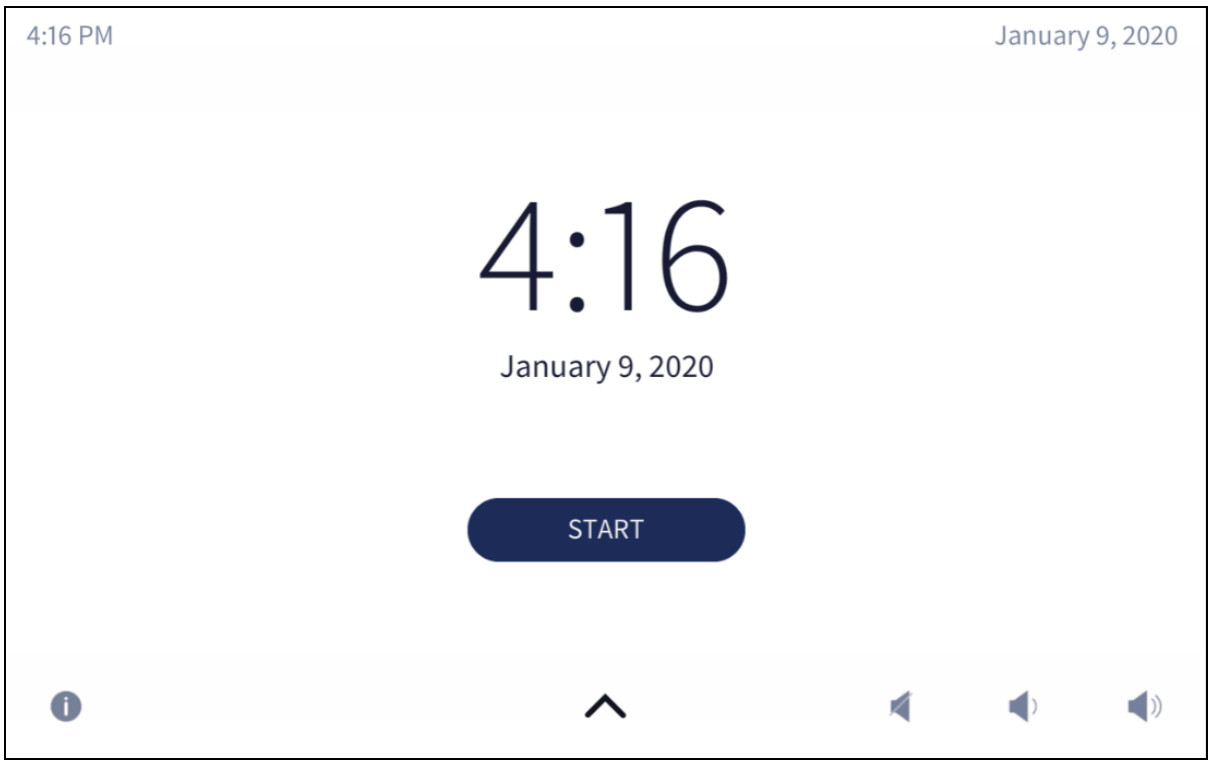
- A custom logo (if turned on through the configuration utility)
- The time and date (if no custom logo is turned on)
- A **START** button that switches to the system's default route automatically (For more information on setting the system's default route, refer to A/V Routing on page 84.)

  > **NOTE:** The **START** button text can be customized using the configuration utility. For more information, refer to Touch Screen Custom Graphics on page 61.

- A **Help** button that provides more information on the functions of this screen (AVF 1.0 UI). The information button in the footer provides the same function for the AVF 2.0 UI and AVF 3.0 UI.

The following image shows a typical home screen when .AV Framework is not connected to a scheduling calendar.

Home Screen (No Scheduling Calendar Connected)



NOTE: If a custom help page image has been configured for the touch screen project, it will be displayed instead of the default help overlay when the information or help button is tapped. For more information, refer to Touch Screen Custom Graphics on page 61.

Room Available

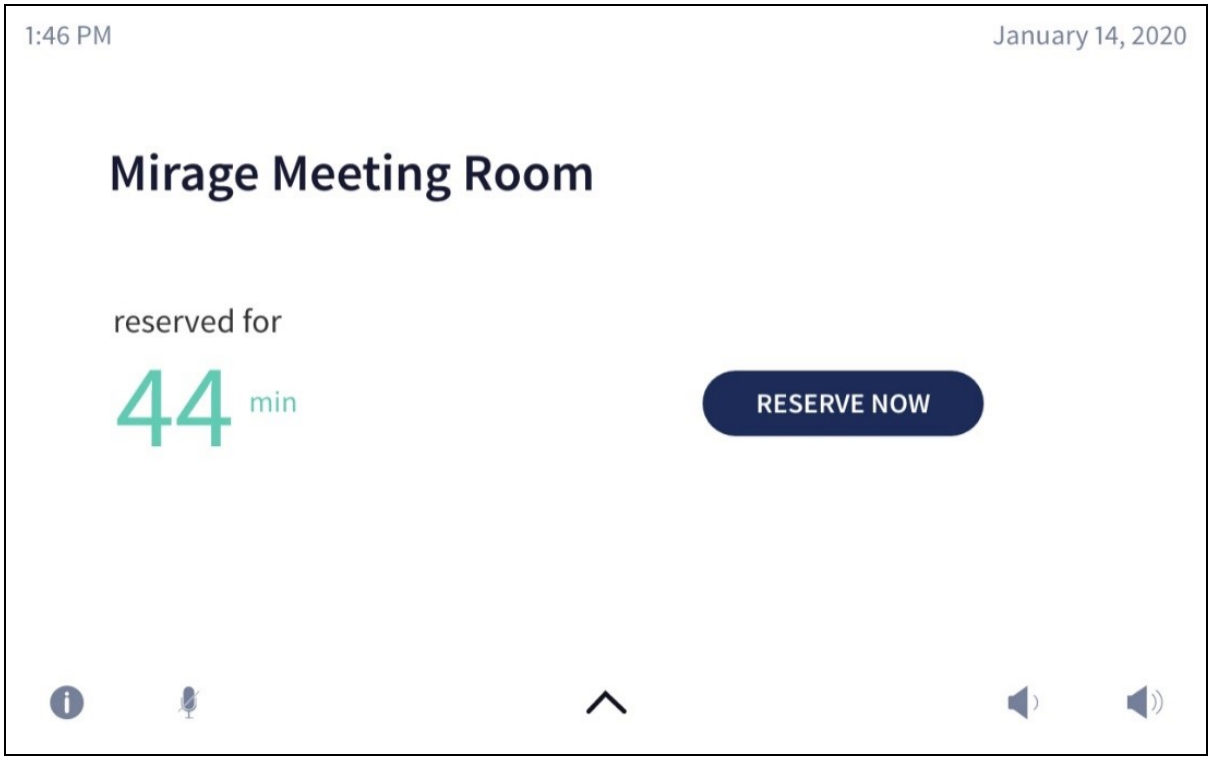
If .AV Framework is connected to a scheduling calendar and the room is available, the home screen provides the following information:

- The time remaining (in minutes) until the next scheduled meeting occurs
- The name, organizer, and duration of the next scheduled meeting (AVF 1.0 UI)

  NOTE: This information is obtained in the AVF 2.0 UI and AVF 3.0 UI by tapping the information button .
- A **RESERVE NOW** button that allows an ad hoc meeting to be scheduled through the touch screen
- A **Help** button that provides more information on the functions of this screen (AVF 1.0 UI). The information button in the footer provides the same function for the AVF 2.0 UI and AVF 3.0 UI.

The following image shows a typical home screen when the room is available.

Home Screen (Room Available)

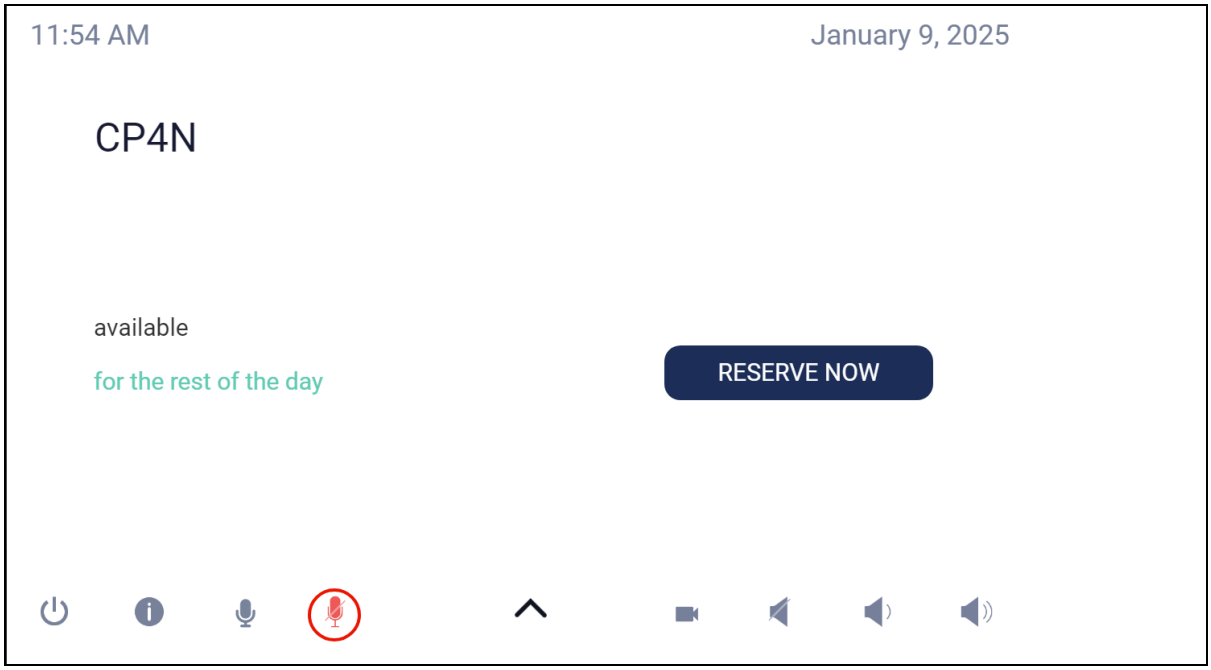


If the room is available for the rest of the day, the home screen provides the following information:

- A **RESERVE NOW** button that allows an ad hoc meeting to be scheduled through the touch screen
- A **Help** button that provides more information on the functions of this screen (AVF 1.0 UI). The information button in the footer provides the same function for the AVF 2.0 UI and AVF 3.0 UI.

The following image shows a typical home screen when the room is available for the rest of the day.

Home Screen (Room Available for the Rest of the Day)



Room Reserved

If the room is not available, the home screen provides the following information:

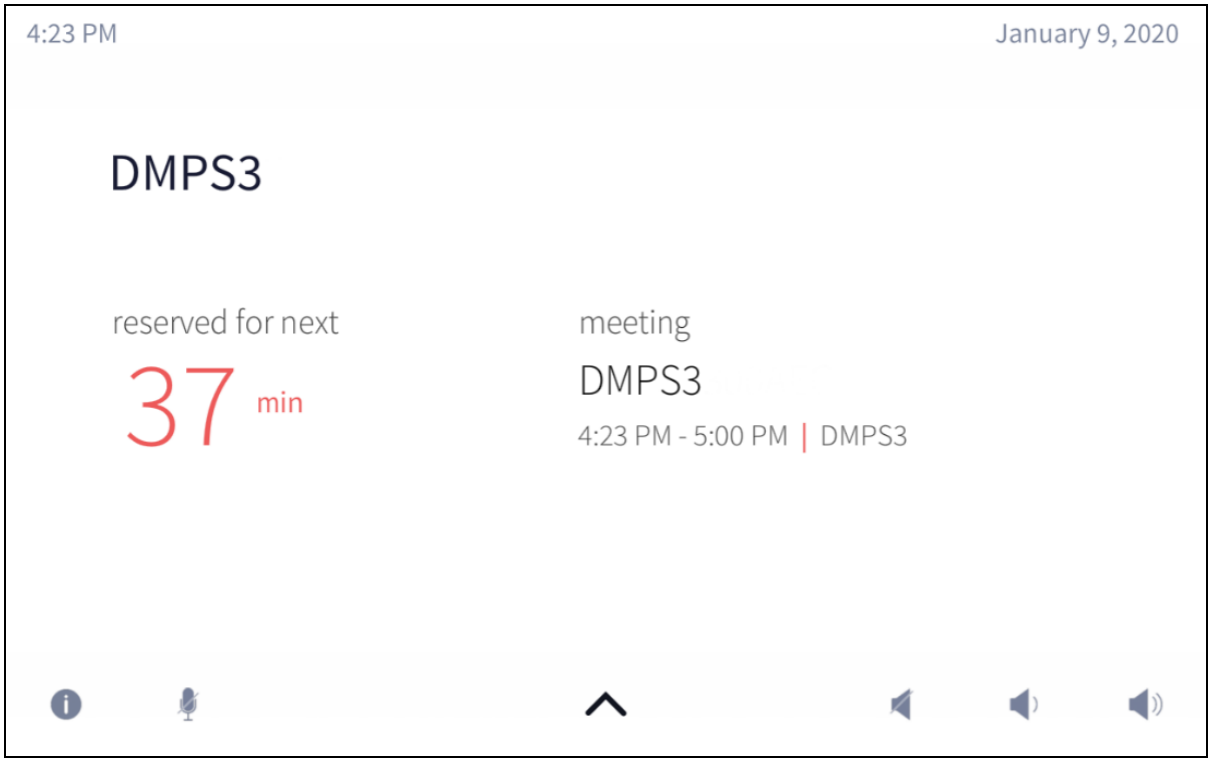
- The time remaining (in minutes) until the current meeting ends
- The name, organizer, and duration of the scheduled meeting (AVF 1.0 UI)

  > **NOTE:** This information is obtained in the AVF 2.0 UI and AVF 3.0 UI by tapping the information button .

- The duration and name of the scheduled meeting
- A **Help** button that provides more information on the functions of this screen (AVF 1.0 UI). The information button in the footer provides the same function for the AVF 2.0 UI and AVF 3.0 UI.

The following image shows a typical home screen when the room is reserved.

Home Screen (Room Reserved)

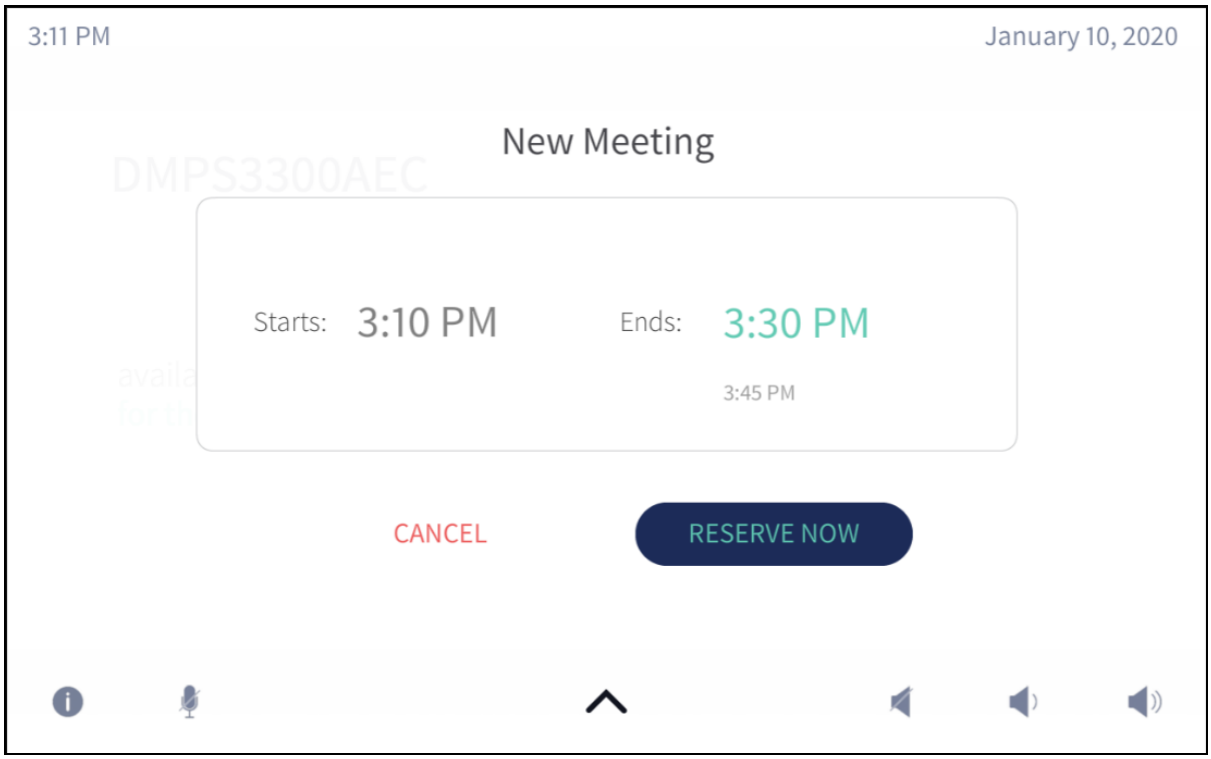


Reserve a Meeting from the Home Screen

To reserve an ad hoc meeting from the home screen when the room is available:

1. Tap **RESERVE NOW** on the home screen. The new meeting screen is displayed.

   New Meeting Screen



2. Tap one of the available meeting end times to set the duration of the meeting. The room can be reserved for up to three lengths:
   - Until the current half hour interval ends (If the current time is 10:17 AM, the end time for this option is 10:30 AM.)
   - Until the current half hour interval ends plus 30 minutes (If the current time is 10:17 AM, the end time for this option is 11:00 AM.)
   - Until the current half hour interval ends plus 60 minutes (If the current time is 10:17 AM, the end time for this option is 11:30 AM.)

   > **NOTE:** These options are available only if a meeting is not already scheduled during that time frame.

3. Tap **RESERVE NOW** to reserve the meeting.

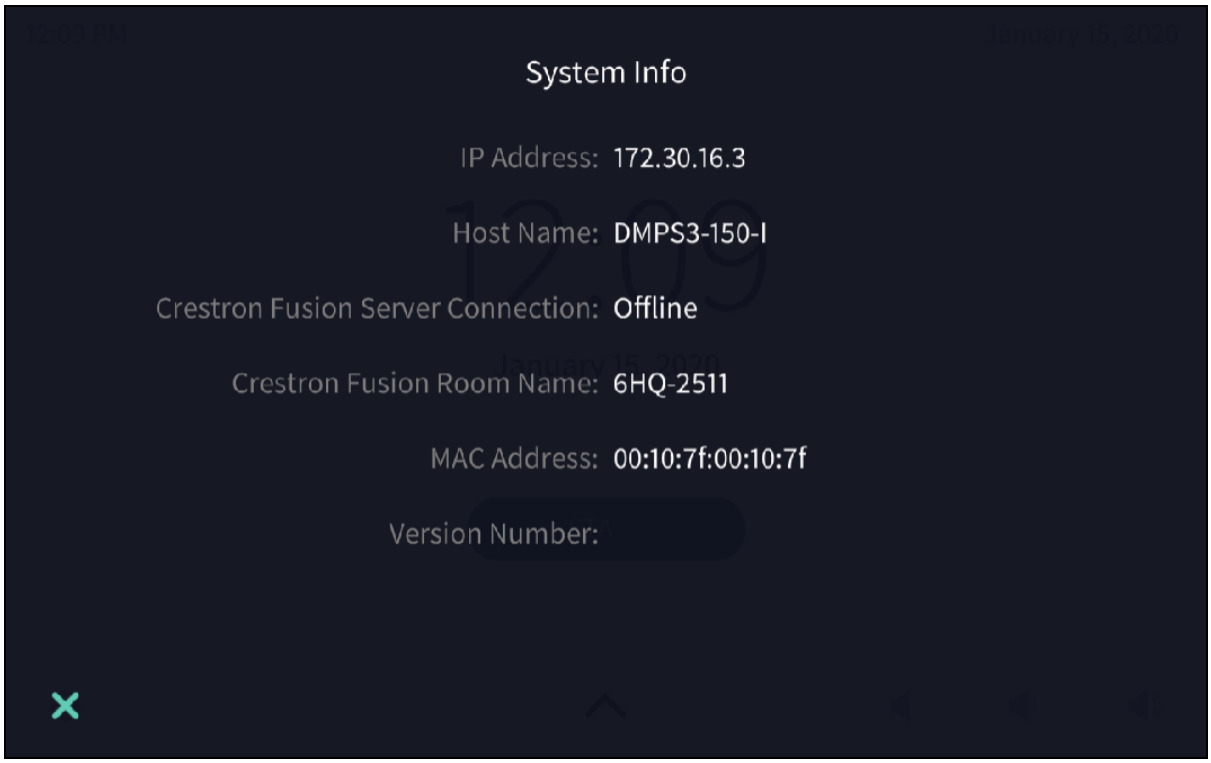
To discard the reservation, tap **CANCEL**.

Access the System Info Screen

To access the **System Info** screen, tap and hold the **Help** or information button on the home screen for 20 seconds.

The **System Info** screen provides the device IP address, the device host name, the Crestron Fusion server connection status, the Crestron Fusion room name, and the device MAC address.

System Info Screen



To exit the **System Info** screen and return to the home screen, tap the **x** button on the bottom right of the screen.

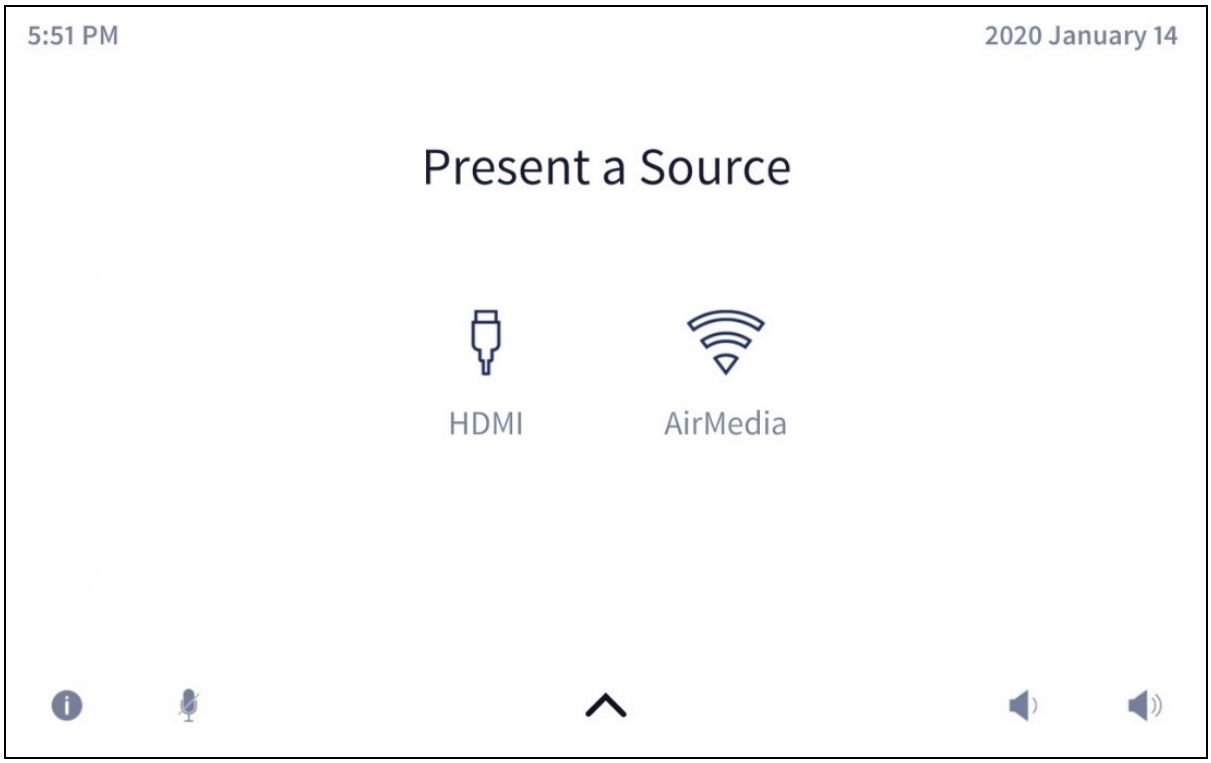
Present a Source Screen Overview

The **Present a Source** screen allows content to be routed from a connected device to displays across the .AV Framework system.

Present a Source Screen – Single Display

If the A/V switcher is configured to use a single display, the **Present a Source** screen appears as shown in the following image.

Present a Source Screen (Single Display)



Select one of the available presentation options to route the selected source to the main display. The source is controlled directly through the touch screen project.

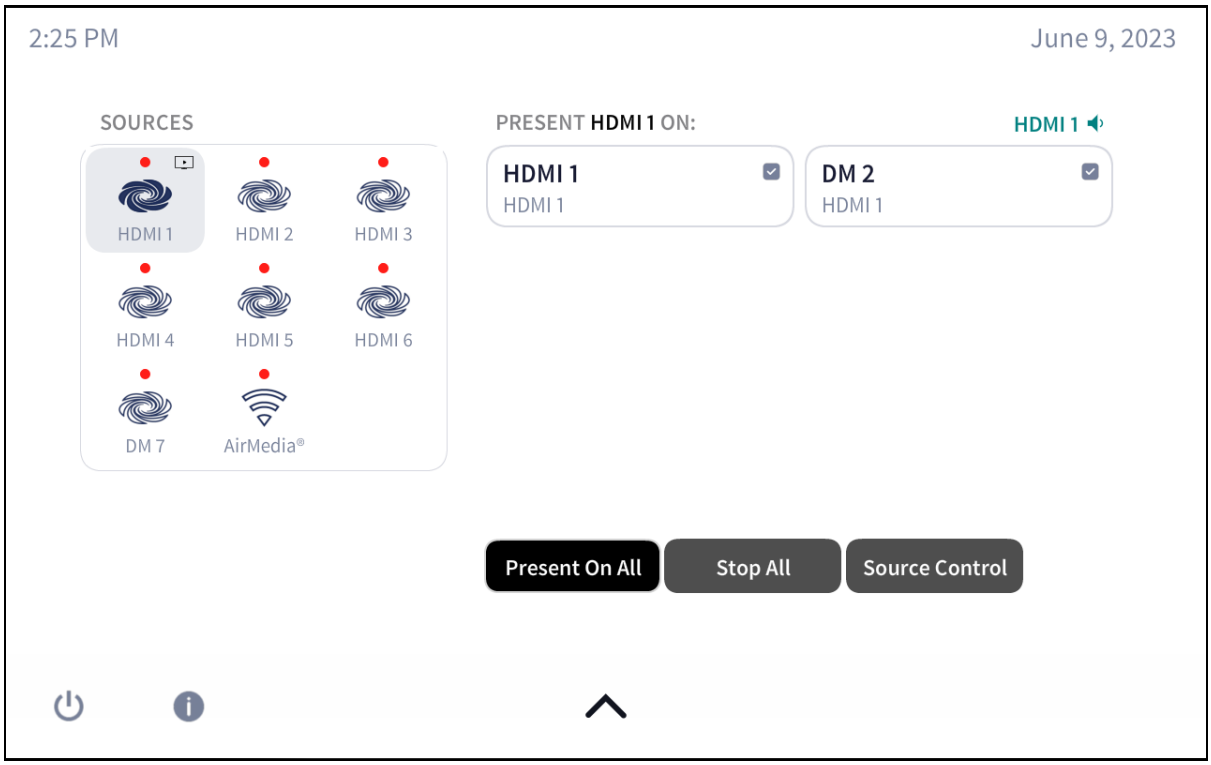
- If a source is active, the source icon is bold, and a **Stop** button is shown. Tap the **Stop** button to stop routing the source to the display.
- If one source is turned on for presentation, the control page for that source loads automatically when the **Present a Source** screen is accessed.

Present a Source Screen - Advanced Multi Display Routing

If the A/V switcher supports and is configured to use multiple displays, and if **Advanced Multi Display Routing** is turned on in the system settings, the present screen appears as shown in the following image.

> **NOTE:** The **Present a Source** screen for advanced multi display routing is available only for the AVF 2.0 UI (Smart Graphics) and AVF 3.0 UI themes.

Present a Source Screen (Advanced Multi Display)



The present screen for advanced multi display routing contains two columns: one for sources, and one for displays. The current audio source for the room is also shown in the top-right corner of the page.

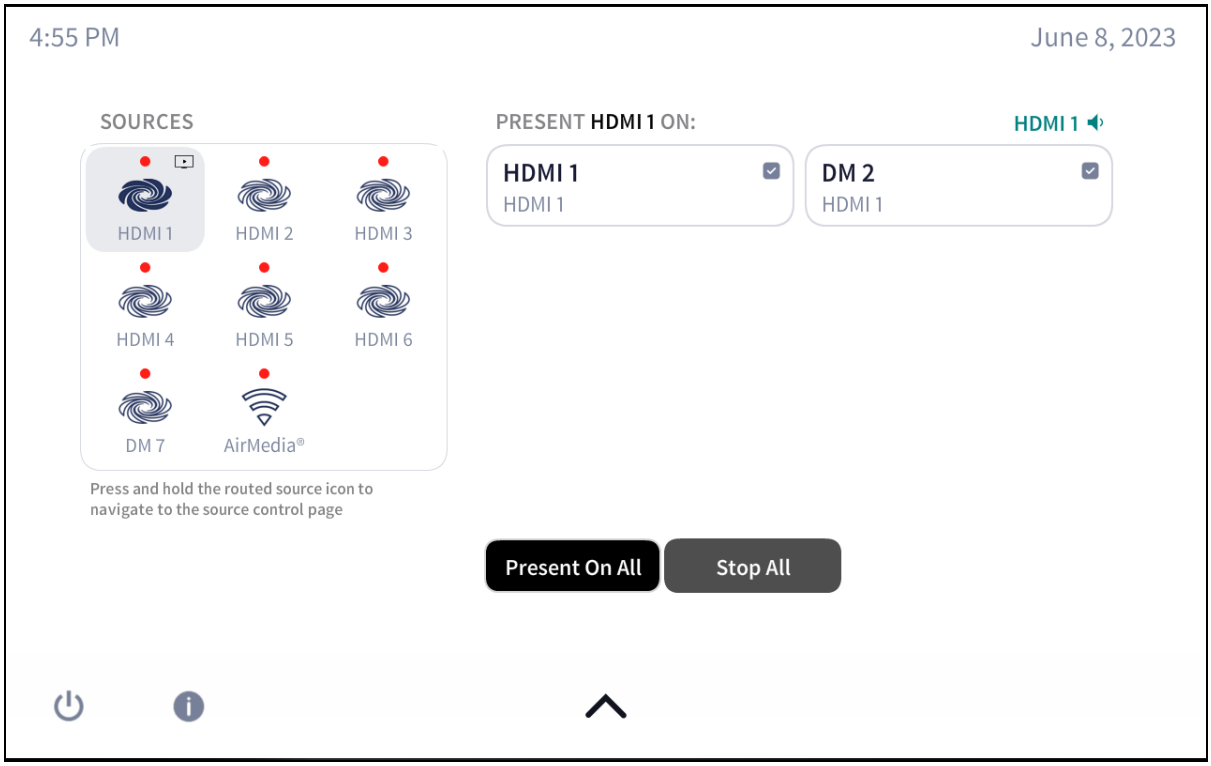
- Select a source under **Sources** to route that source to one or more displays. The source shows a playing icon in its top-right corner if it is selected.
- Fill the checkbox next to one or more displays under **Present [Source] On** to route the selected source to those displays.

The following controls are also provided:

- Tap **Present On All** to present the selected source to all displays in the system.
- Tap **Stop All** to stop source routing to all displays in the system.
- Tap **Source Control** to navigate to the source control page for the selected source.

If **Enable Press and Hold for Source Control** is turned on in the system settings, the **Source Control** button is removed from the screen. Instead, source control pages can be viewed by pressing and holding the desired source under **Sources** for a specified duration.

Present a Source Screen (Advanced Multi Display) - Press and Hold for Source Control

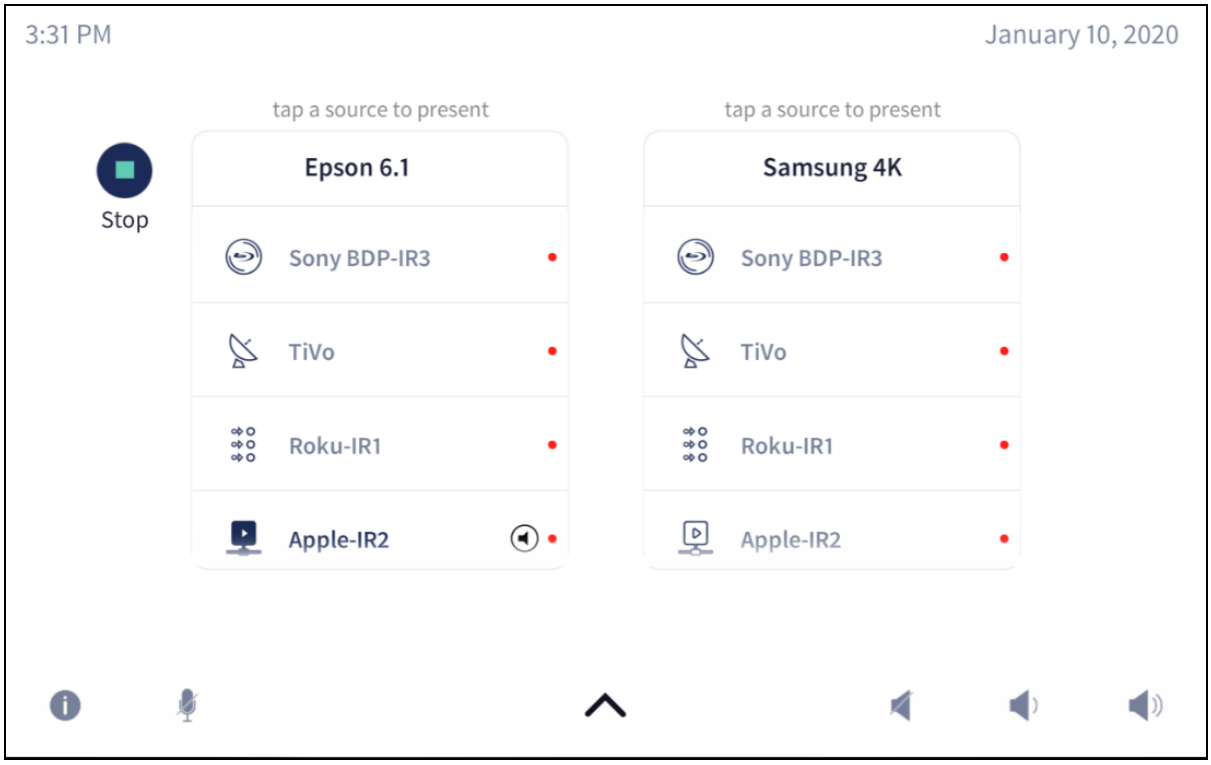


For more information on configuring advanced multi display routing, refer to Touch Screen Custom Graphics on page 61.

Present a Source Screen – Dual Display (Legacy)

If the A/V switcher supports and is configured to use two displays, and if **Advanced Multi Display Routing** is turned off in the system settings, the present screen appears as shown in the following image.

Present a Source Screen (Dual Display)



The present screen for dual display presenting contains two columns (one for each display). Select one of the available presentation options in the appropriate column to route the selected source to the desired display.

Once a source is chosen, the source text and icon turn bold and the following controls are available:

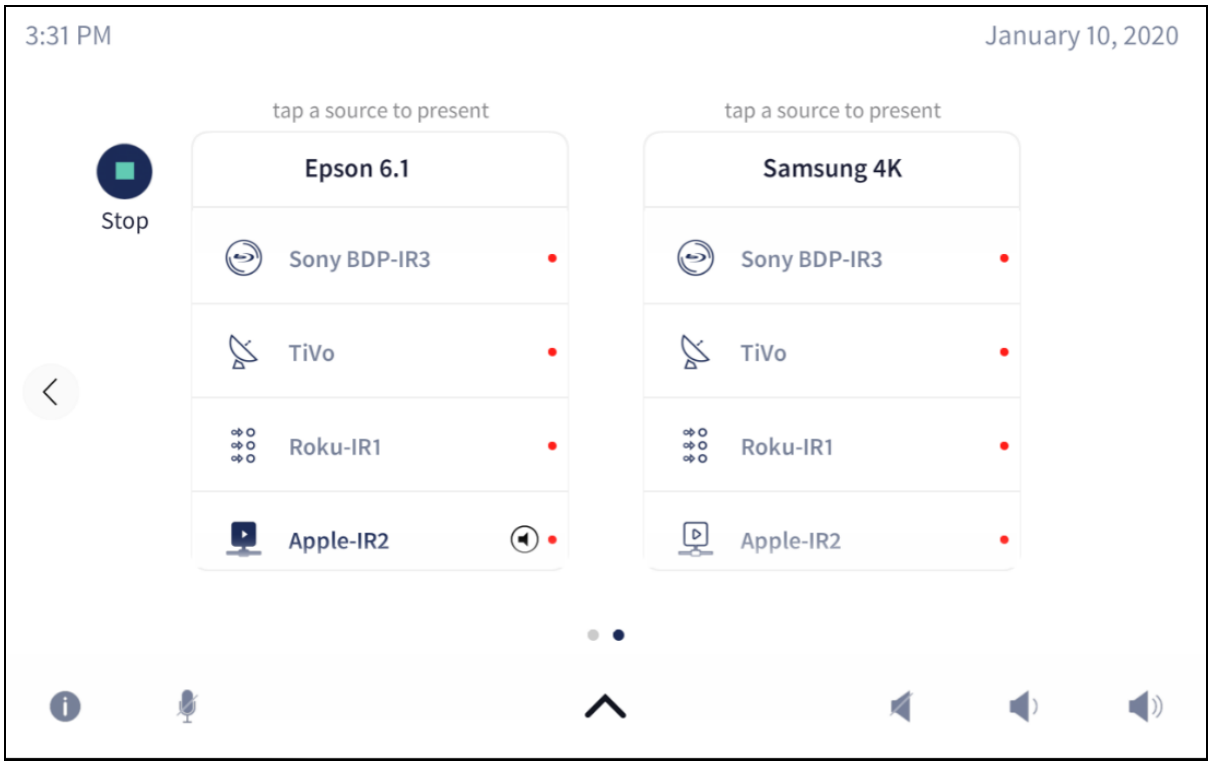
- Tap the source to display device-specific controls.
- Tap **Stop** to stop presenting the chosen source.
- Tap the speaker icon to the right of the chosen source to adjust the volume settings for the source.

Each available source has a green or red icon on the right side of the source's column. A green icon indicates that a video signal is present for that source, while a red icon indicates that a video signal is not present.

Present a Source Screen – More than Two Displays (Legacy)

If the A/V switcher supports and is configured to use more than two displays, and if **Advanced Multi Display Routing** is turned off in the system settings, the present screen appears as shown in the following image.

Present a Source Screen (Dual Display)



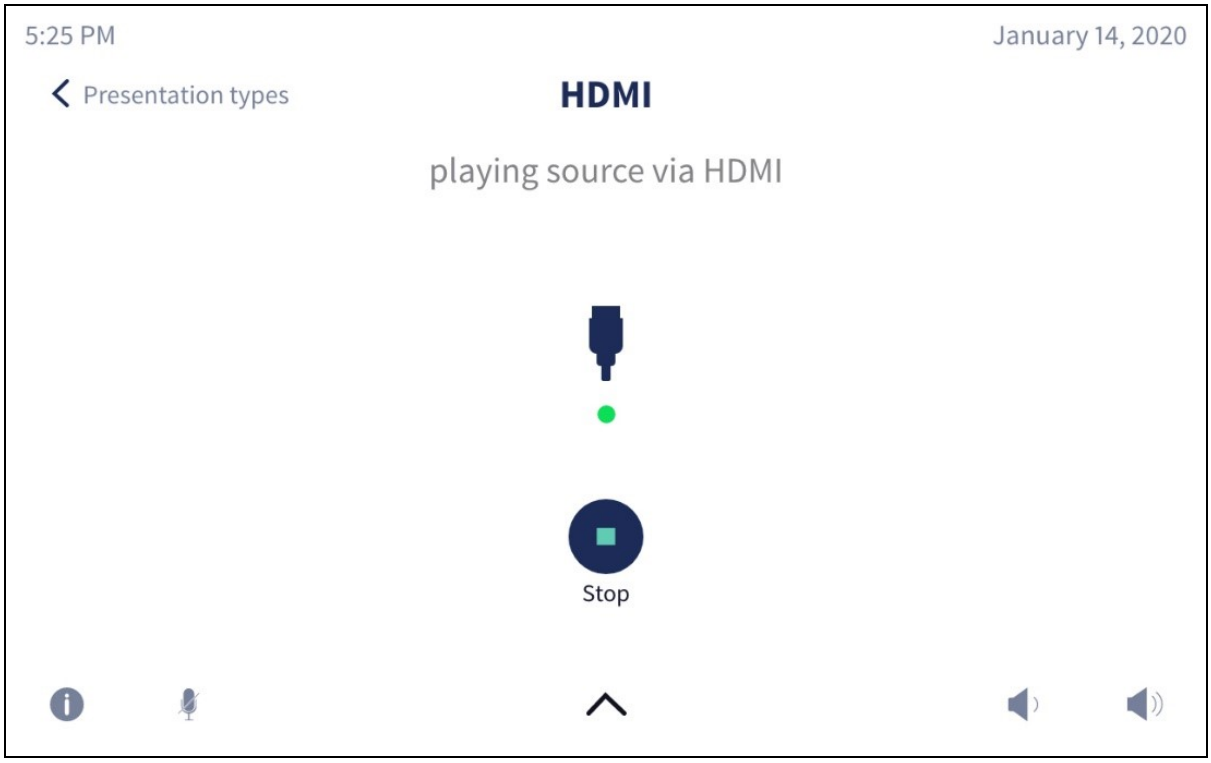
The present screen for two or more displays is functionally similar to the present screen for dual display. However, additional displays can be accessed by tapping the arrow icons on either side of the screen.

Each screen contains page indicator dots to show the total number of display screens and to highlight the screen that is currently selected (represented by an opaque gray dot).

Now Presenting Screen - HDMI Source

When a source connected by HDMI (such as a laptop) is selected, the following screen is displayed.

Present Screen - HDMI Source



The **Now Presenting** screen for HDMI provides the input name and connection type. The dot in the center of the screen turns green if the source is connected and turns red if the source is disconnected.

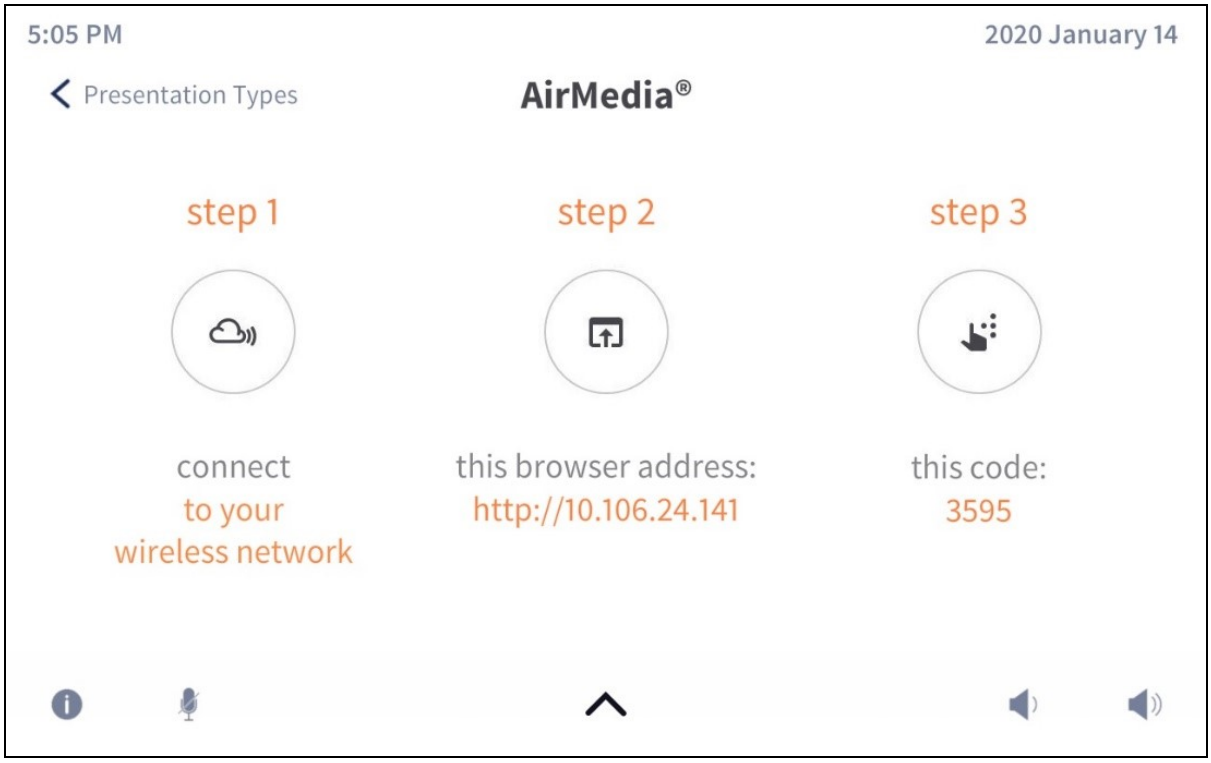
Tap **Stop** to disconnect from the HDMI source.

Tap the back arrow **<** to return to the **Present a Source** screen. Tapping the back arrow does not disconnect the source.

AirMedia Screen

When an AirMedia® presentation gateway source is selected and the wireless connection has not already been established, the following screen is displayed.

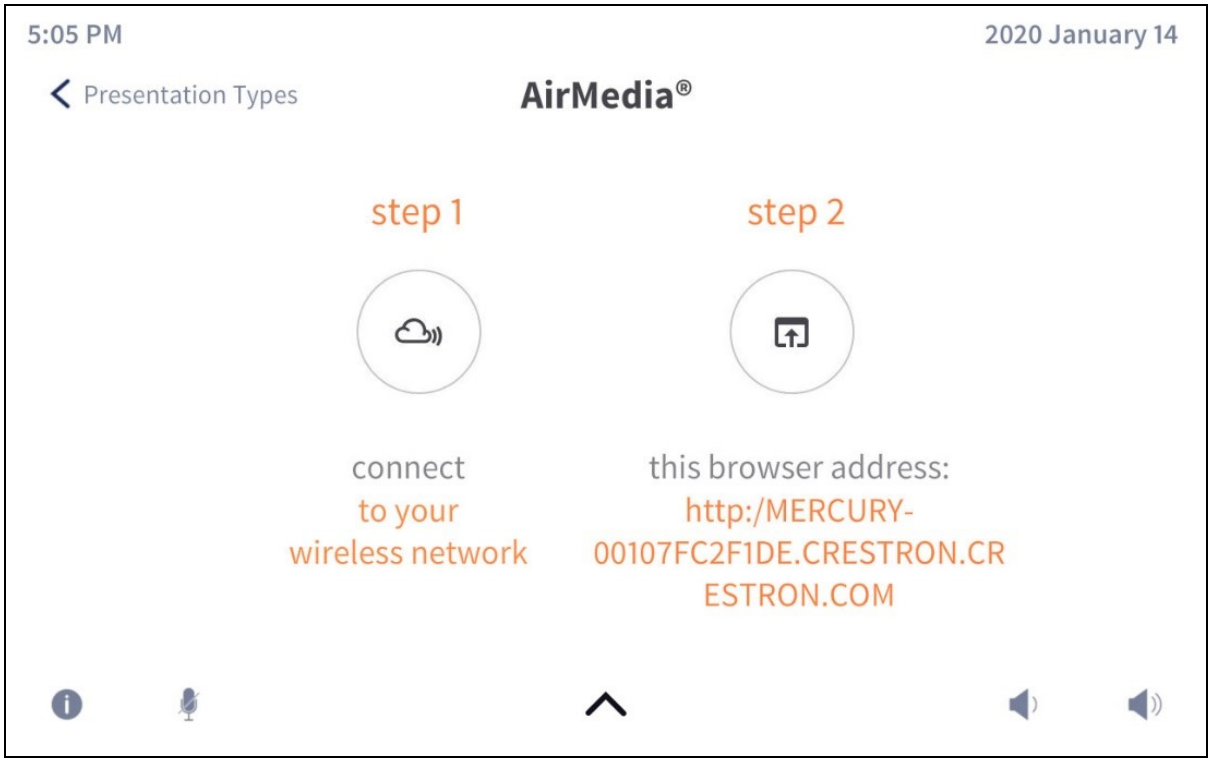
AirMedia Screen



The **AirMedia** screen provides instructions for connecting to the AirMedia device over a wireless network. Once this connection has been established, AirMedia can be selected as a presentation source.

If the connection code has been turned off, a version of the **AirMedia** screen is displayed that omits this step. For more information on turning off the connection code, refer to the AirMedia device's documentation at www.crestron.com/manuals.

AirMedia Screen - Connection Code Turned Off

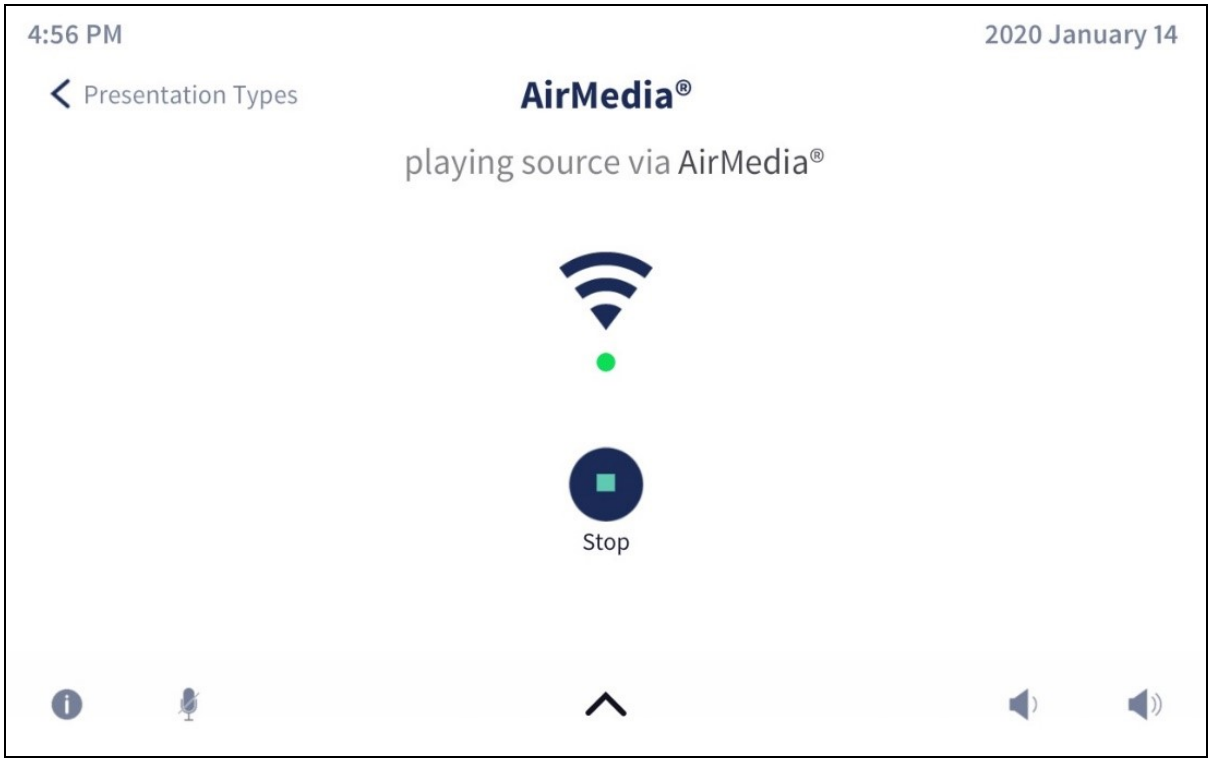


Tap the back arrow **<** to return to the **Present a Source** screen.

Now Presenting Screen - AirMedia Source

When an AirMedia source is selected (once a wireless connection has been established), the following screen is displayed.

Present Screen - AirMedia Source



The **Now Presenting** screen for AirMedia shows that the source is connected wirelessly over AirMedia. The dot in the center of the screen turns green if the source is connected and turns red if the source is disconnected.

Tap **Stop** to disconnect from the AirMedia source.

Tap the back arrow **<** to the **Present a Source** screen. Tapping the back arrow does not disconnect the source.

Now Presenting Screen - Other Source Devices

The touch screen project provides custom **Now Presenting** screens for various source devices, such as cable TV receivers and video servers, which include controls that are specific to the device and that are mapped via the device driver.

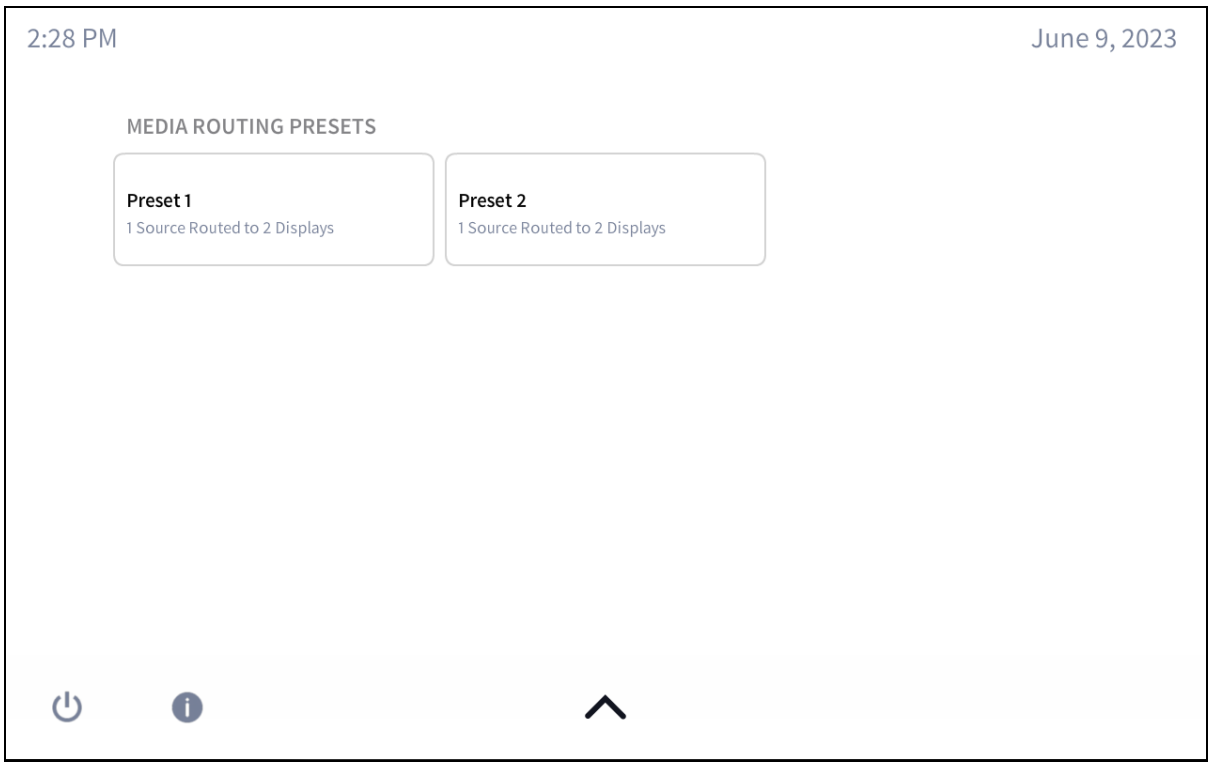
To view more examples of **Now Presenting** screens for other source devices, refer to the .AV Framework DMPS UI Guide at www.crestron.com/manuals.

Media Routing Presets Screen Overview

The **Media Routing Presets** screen allows up to 9 source routing presets to be recalled from a single location in the touch screen project.

> **NOTE:** The **Media Presets** screen is available only for the AVF 2.0 UI (Smart Graphics) and AVF 3.0 UI themes.

Media Presets Screen



Tap one of the provided media presets to select it. The media preset is recalled immediately, and the **Present a Source** screen updates to show the new source and display route(s).

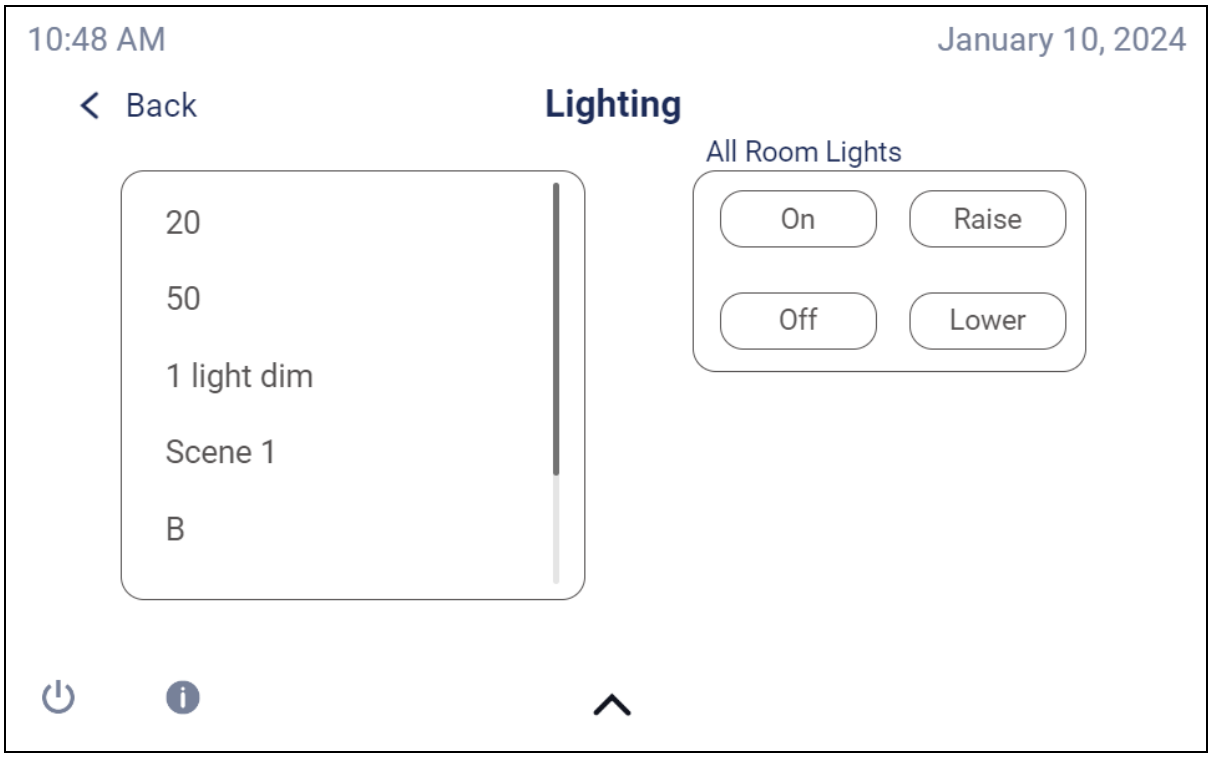
For more information on configuring media presets, refer to Media Presets on page 86.

Lighting Screen Overview

The **Lighting** screen allows configured lighting presets to be recalled from a single location in the touch screen project.

> **NOTE:** The **Lighting** screen is available only for the AVF 3.0 UI theme.

Lighting Screen



The following controls are provided:

- Tap one of the provided lighting presets in the menu to select it. The lighting preset is recalled immediately. For lighting devices that support multiple rooms, the presets shown are determined by the room selected in the web configuration interface.
- Tap one of the **All Room Lights** controls to perform actions for all lights in the room. These controls will vary based on the connected platform (lighting) device.

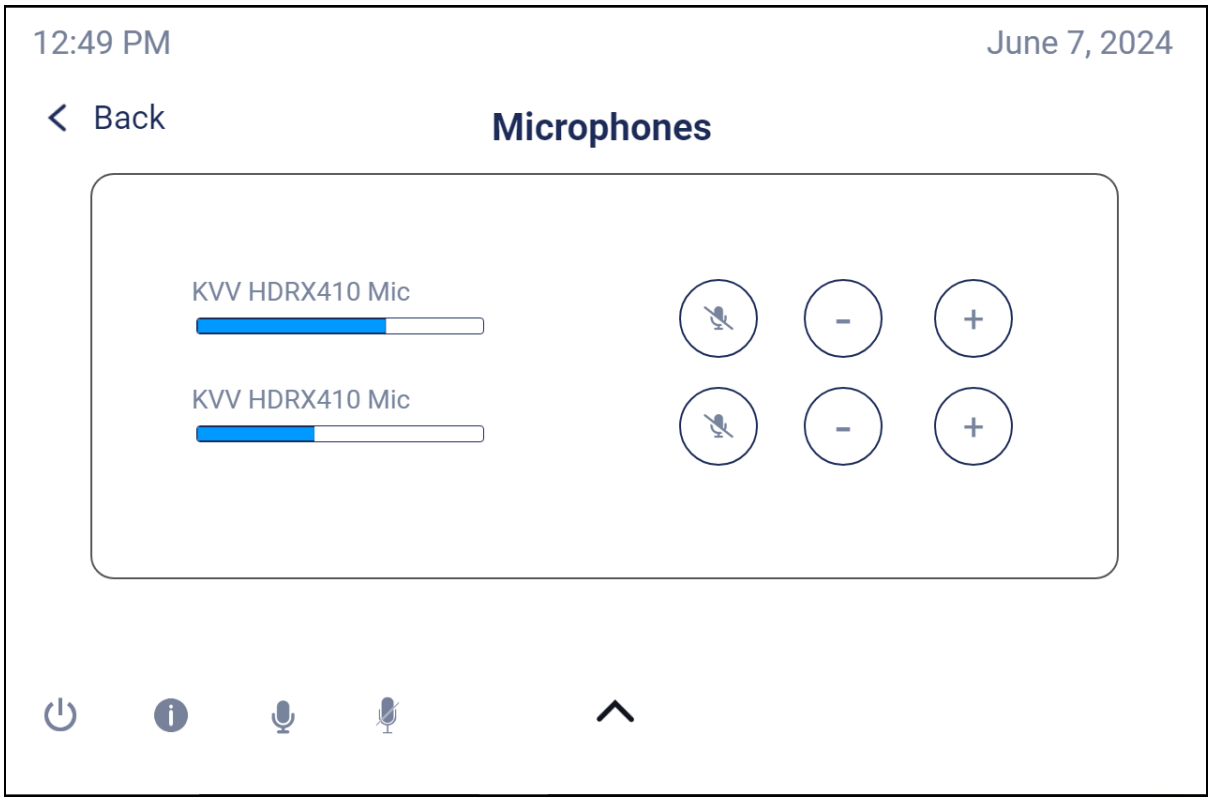
For more information on configuring lighting presets, refer to Lighting on page 88.

Microphones Screen Overview

The **Microphones** screen allows configured microphones to be controlled from a single location in the touch screen project.

> **NOTE:** The **Microphones** screen is available only for the AVF 3.0 UI theme.

Microphones Screen



The following controls are provided:

- Tap the microphone mute button to the right of a microphone to mute or unmute that microphone.

  > **NOTE:** If **Include In Privacy Mute** is turned on for the microphone, turning on privacy mute for the system will mute the microphone regardless of its current mute setting.

- Tap the minus (**-**) or plus (**+**) buttons to lower or raise the volume level for the microphone (in 1 dB increments), which is represented by the scale underneath the microphone name.

  > **NOTE:** The range that the microphone can be raised or lowered is dictated by the threshold values set for **Min Adjust Level** and **Max Adjust Level**.

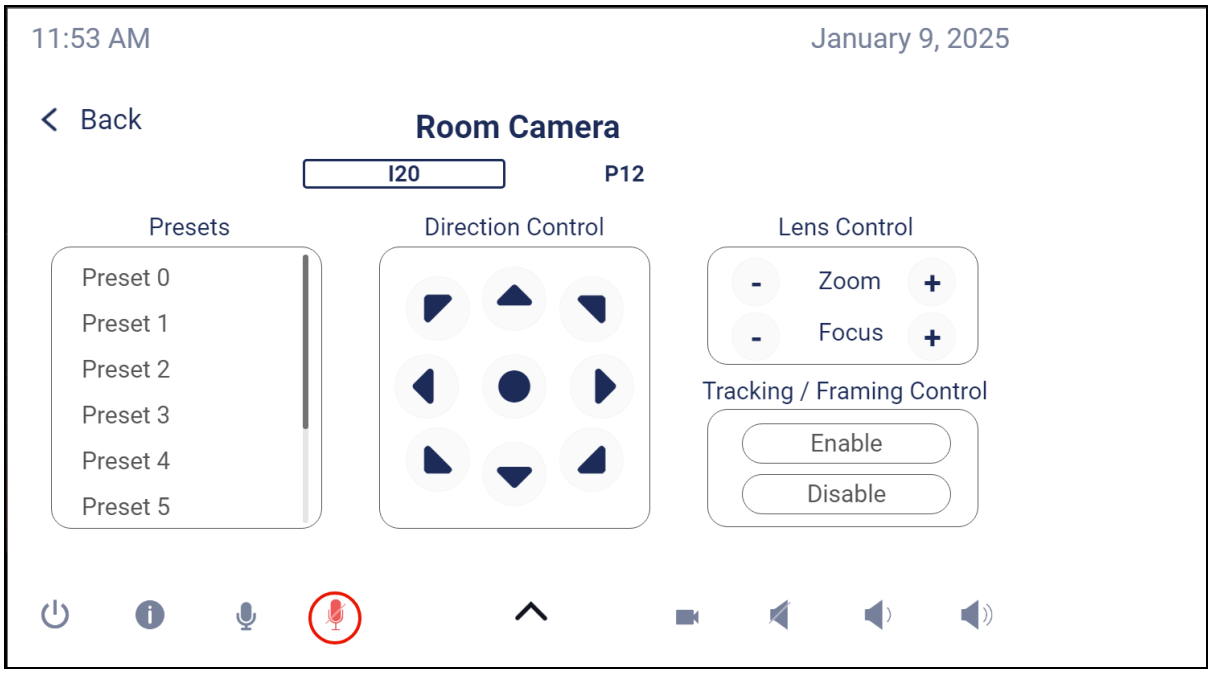
For more information on configuring microphones, refer to Audio Settings on page 59.

Room Camera Screen Overview

The **Room Camera** screen allows configured room cameras to be controlled from a single location in the touch screen project.

> **NOTE:** The **Room Camera** screen is available only for the AVF 3.0 UI theme.

Room Camera Screen



The following controls are provided:

> **NOTE:** The provided controls are dependent on those exposed in the room camera device driver. Ensure all required camera devices have been added to your .AV Framework system.

- Select a room camera from the tabs directly under the **Room Camera** heading to expose controls for that camera.

  > **NOTE:** Up to five room cameras can be added to an .AV Framework system at once.

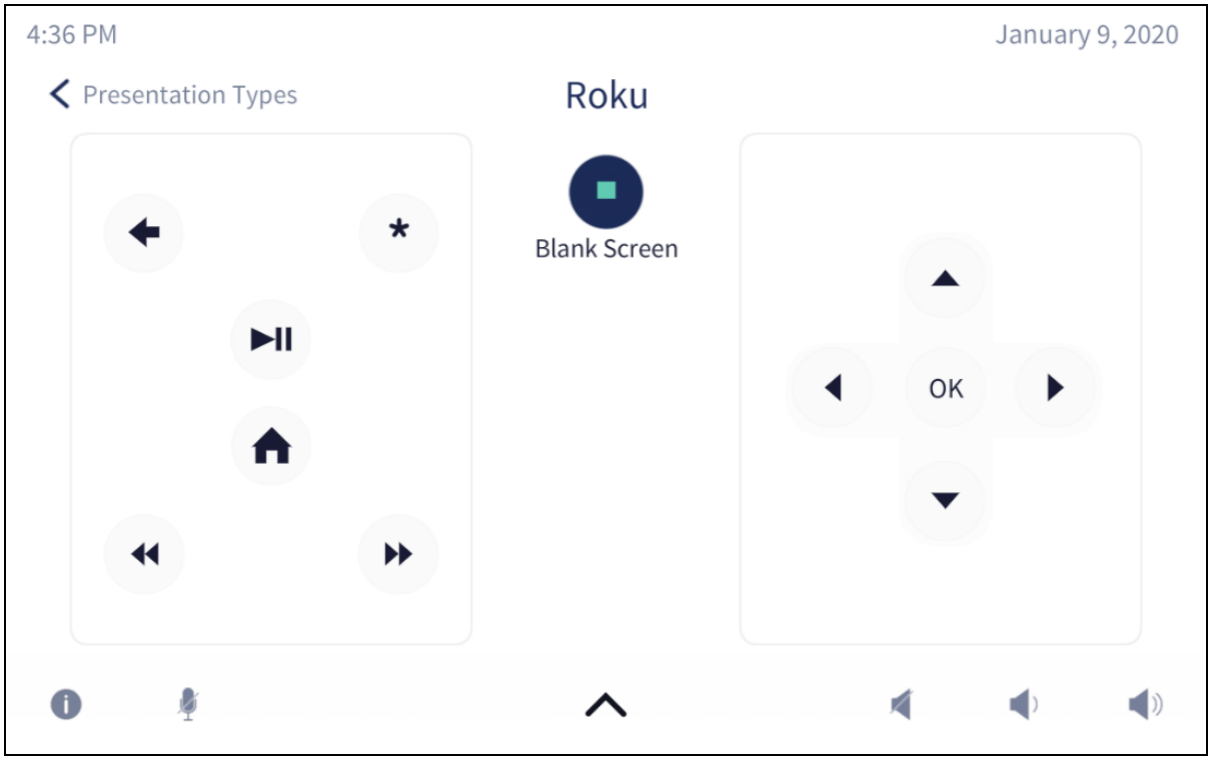
- If supported, select a camera shot preset from the **Presets** menu.
- If supported, use the **Direction Control** buttons to adjust the camera shot direction.
- If supported, use the **Lens Control** settings to increase or decrease the camera zoom and focus.
- If supported, enable or disable **Tracking/Framing Control** using the provided buttons.

Video Mute

Certain projector and flat panel display devices allow the projected picture and sound to be temporarily turned off. This functionality can be controlled in .AV Framework using the video mute function.

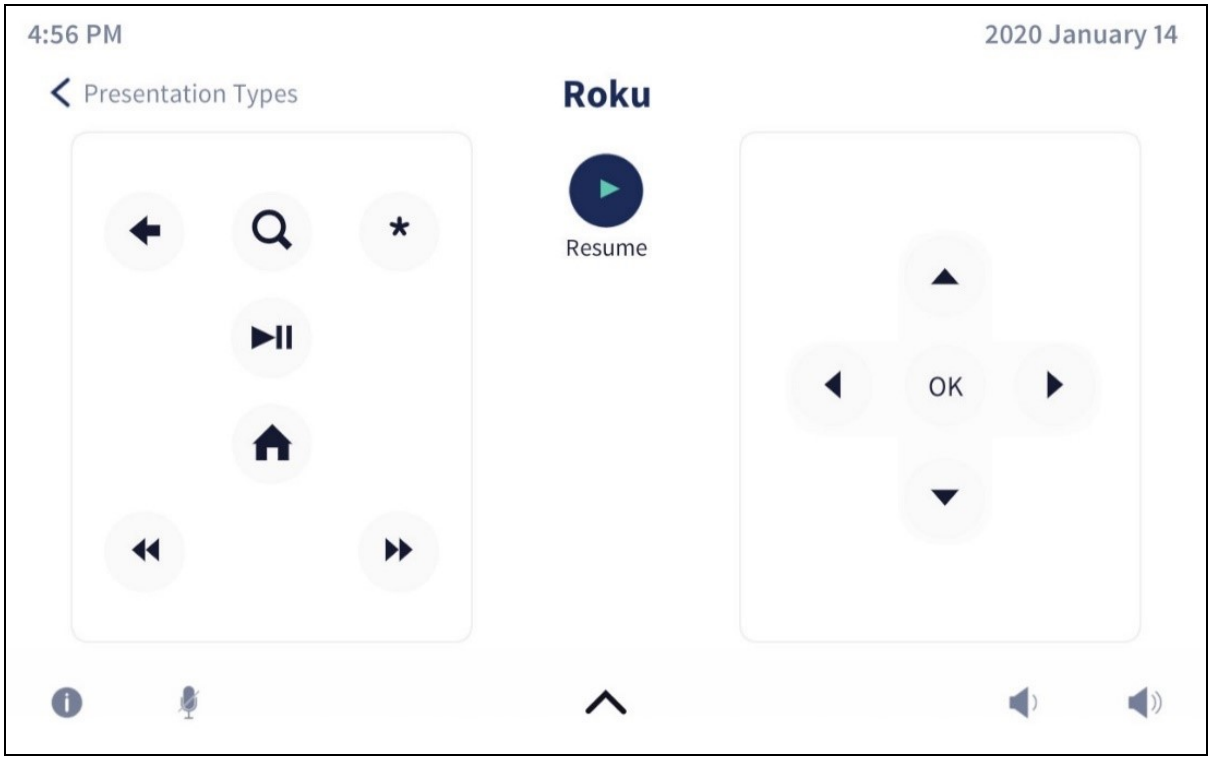
If there is a display in the video mute group, the **Now Presenting** screen on the touch screen user interface shows a **Blank Screen** button in place of the **Stop** button.

Now Presenting Screen – Blank Screen Button



Tap **Blank Screen** to mute the video source. The button text changes to **Blanking** while the source is stopping, and then turns to **Resume** after the source is stopped.

Now Presenting Screen – Resume Button



Tap **Resume** to resume showing the video source. The button text changes to Resuming while the source is resuming, and then turns back to **Blank Screen** after the source has resumed.

Video mute can also be performed via the MPC3 button panel, via a MP-B10 or MP-B20 button panel or using the video mute button on the device itself or device remote (if applicable). The buttons on the MP-B10/MP-B20 flash when video mute is initiated or active and stop flashing when Video Mute is inactive. The touch screen user interface updates the video mute buttons accordingly to reflect the current state.

Appendix A: Interface Setup

This appendix provides information on how to connect various supported interfaces to the .AV Framework system.

Connection Overview

To connect Ethernet devices, use one of the following methods:

> **NOTE:** A device must only be assigned to one room unless it is a shared device or a touch screen device.

- Specify the Room ID of the room that is running the .AV Framework program. For more information, refer to the embedded Crestron Virtual Control help file.
- Set the IP table of the Ethernet device to point to the IP address or host name of the Crestron Virtual Control server via the device setup pages (if available) or via the **IP table** dialog box in Crestron Toolbox software.

Devices can also be associated with rooms manually. For more information, refer to the Crestron Virtual Control Server Software Product Manual.

If a device with older firmware is not on the same subnet as the Crestron Virtual Control server, it cannot be discovered by the server. As a workaround, the admin can create a "device_resolution.cfg" file that contains the FQDN (fully qualified domain name), MAC address, and device type for any cross-subnet devices with older firmware. The Crestron Virtual Control service reads this file on start up and then once every hour while the service is running.

For more information, refer to the Crestron Virtual Control Server Software Product Manual.

> **NOTE:** Some older devices, such as the MP-B10/MP-B20 button panels and Crestron Connected devices, may require DNS names to be created manually for them to work with the device resolution configuration.

TSW Series Touch Screens

Connect a supported Crestron TSW series touch screen (TSW-752, TSW-1052, TSW-760, TSW-1060, TS-770/1070, and TS/TSW-1070) to the .AV Framework system to control room scheduling and source selection functions from the touch screen.

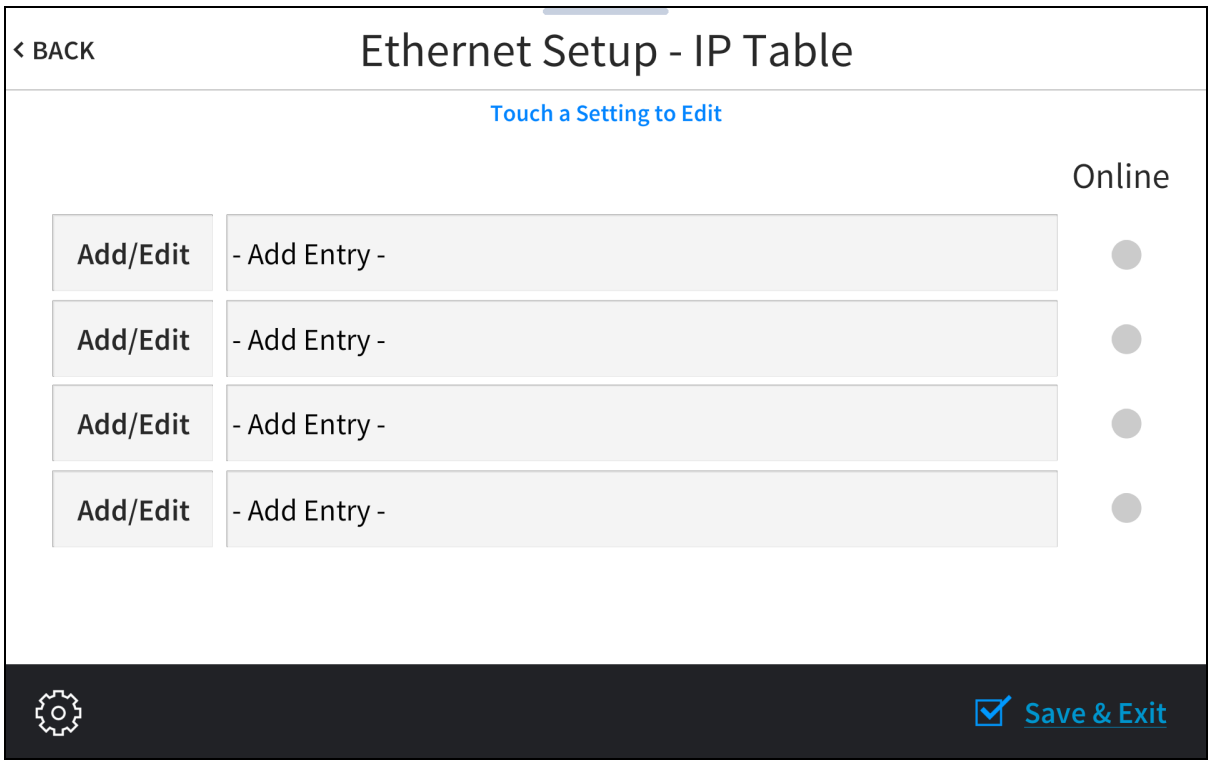
> **NOTE:** The .AV Framework touch screen project must be loaded on the touch screen prior to operation.

To connect a TSW series touch screen:

> **NOTE:** Ethernet setup screens for the TS/TSW-70 series touch screens are shown for this procedure. Similar screens are used to connect the other supported touch screen models.

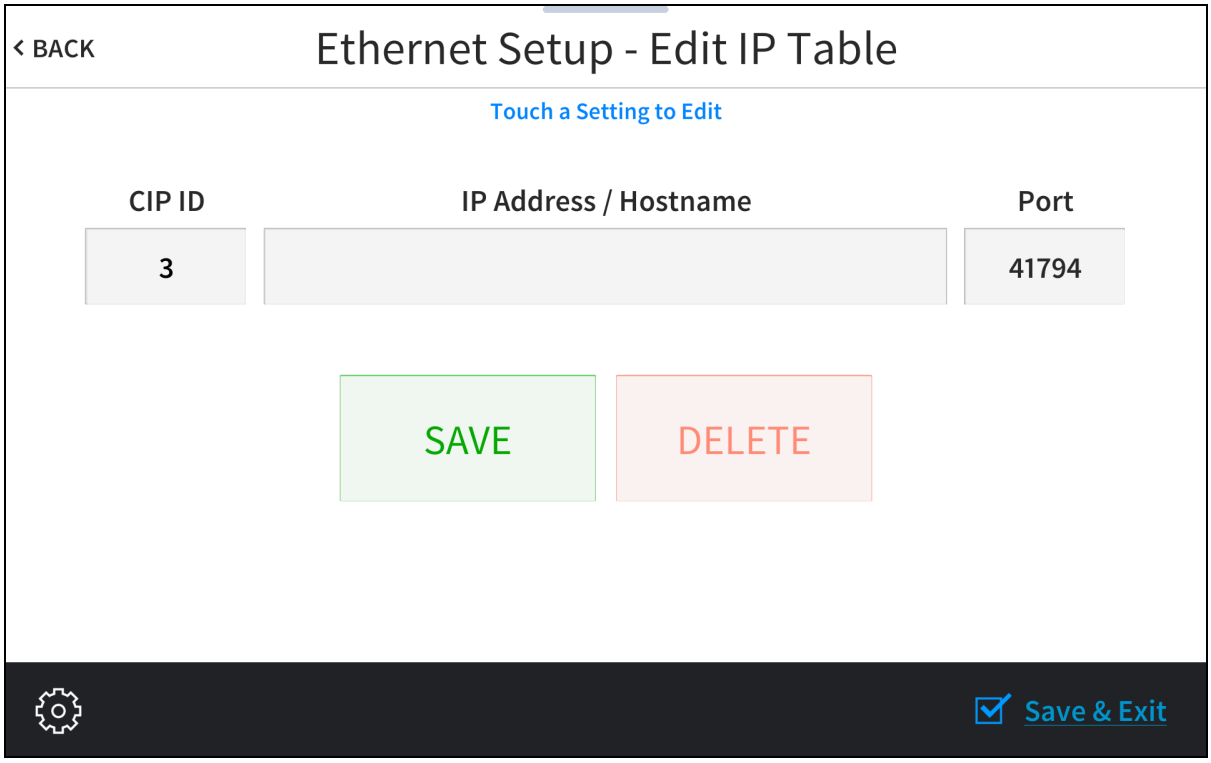
1. On the **Setup** screen, tap **IP Table Setup** to display the **Ethernet Setup - IP Table** screen.

Ethernet Setup - IP Table Screen



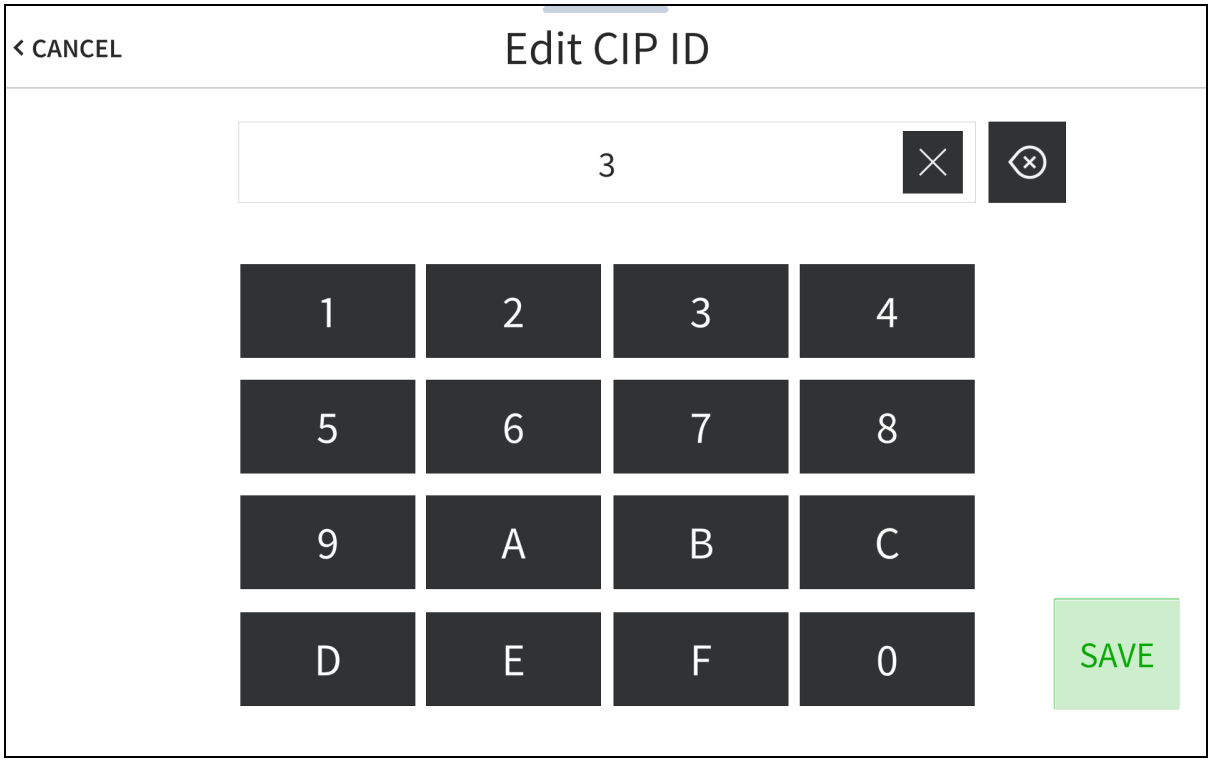
2. Tap **Add/Edit** next to an empty IP table entry. The **Ethernet Setup - Edit IP Table Entry** screen is displayed.

Ethernet Setup - Edit IP Table Screen



3. Tap the text field below **CIP ID** to display the **Edit CIP ID** on-screen hex keypad.

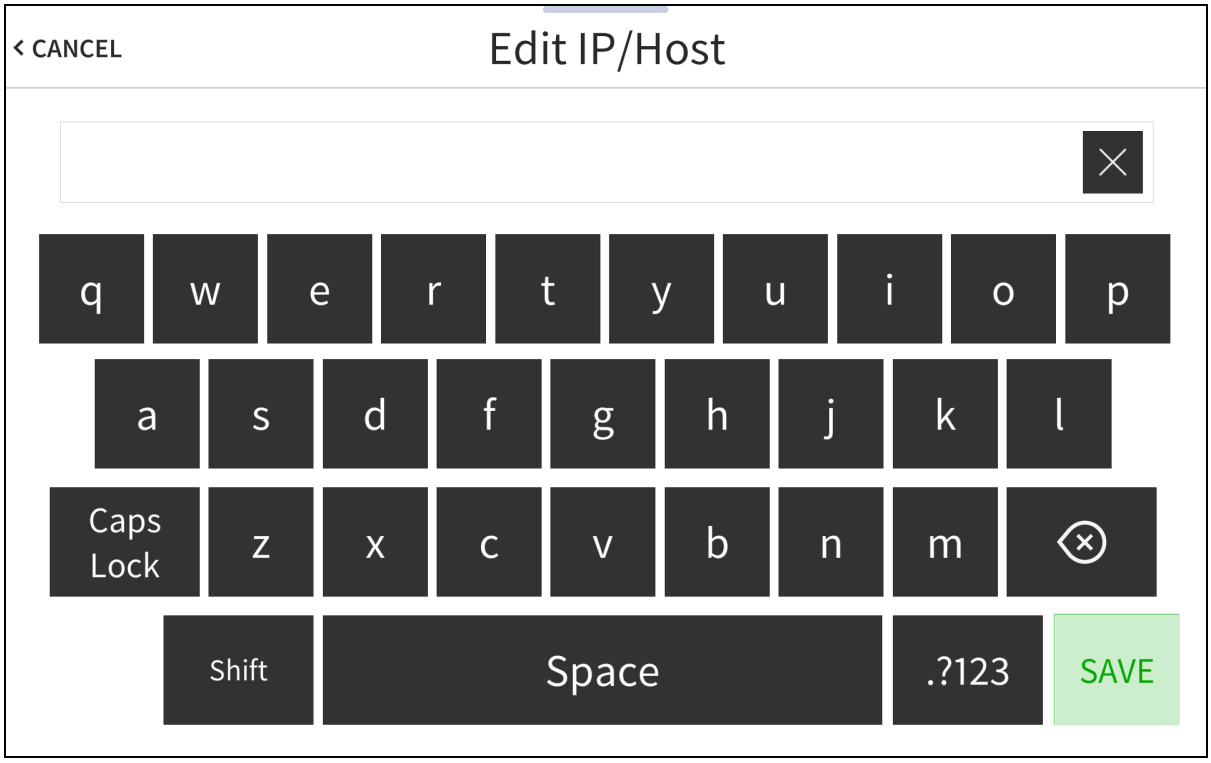
Edit CIP ID - On-Screen Hex Keypad



4. Use the keypad to enter the IP ID for connecting to the Crestron Virtual Control server.
   - Tap the clear button in the text field to clear any previous entry.
   - Tap the delete button to delete the last digit.
   - Tap **SAVE** to save a new entry or tap **< CANCEL** to discard any changes.

5. Tap the text field below **IP Address / Hostname** to display the **Edit IP/Host** on-screen keyboard.

Edit IP/Host - On-Screen Keyboard



6. Use the keyboard to enter the IP address or host name of the Crestron Virtual Control server.
   - Tap the clear button ⊗ in the text field to clear any previous entry.
   - Tap the delete button ⊗ to delete the last digit.
   - Tap **SAVE** to save a new entry or tap **< CANCEL** to discard any changes. The display returns to the **Ethernet Setup - IP Table** screen.
7. On the **Ethernet Setup - IP Table** screen, tap **SAVE** to save the current entry.

> **NOTE:** To have a touch screen project loaded from the Crestron Virtual Control server, use the Room ID in the touch screen IP table.

XPanel

XPanel allows a virtual touch screen project to be configured for system testing and control.

- Crestron Contstruct™ IDE and legacy Crestron HTML5 User Interface projects (.ch5z) run on the browser-based HTML5 Web XPanel.
- Legacy SmartGraphics® projects (.vtz) run on the Desktop XPanel software.

Instructions for using each XPanel type are provided in the sections that follow.

HTML5 Web XPanel Configuration

HTML5 Web XPanel is a feature that transforms any compatible HTML5 web browser into a virtual Crestron touch screen, which is supported on Windows®, macOS®, and Android™ operating systems. HTML Web XPanel works on any computer platform and any screen size, and only requires a touch screen display and a mouse (or other pointing device) to operate. Screen reader accessibility support can also be built into the HTML Web XPanel project using standard accessibility web development methodologies.

HTML5 Web XPanel is compatible with .AV Framework software and can be used in place of the standard Web XPanel interface provided with the software. The **Webx** touch screen device must be added to the .AV Framework system to use the HTML Web XPanel. The **UCWebXpanel** touch screen device is also provided that allows the .AV Framework system to connect to a UC-ENGINE user interface via HTML Web XPanel.

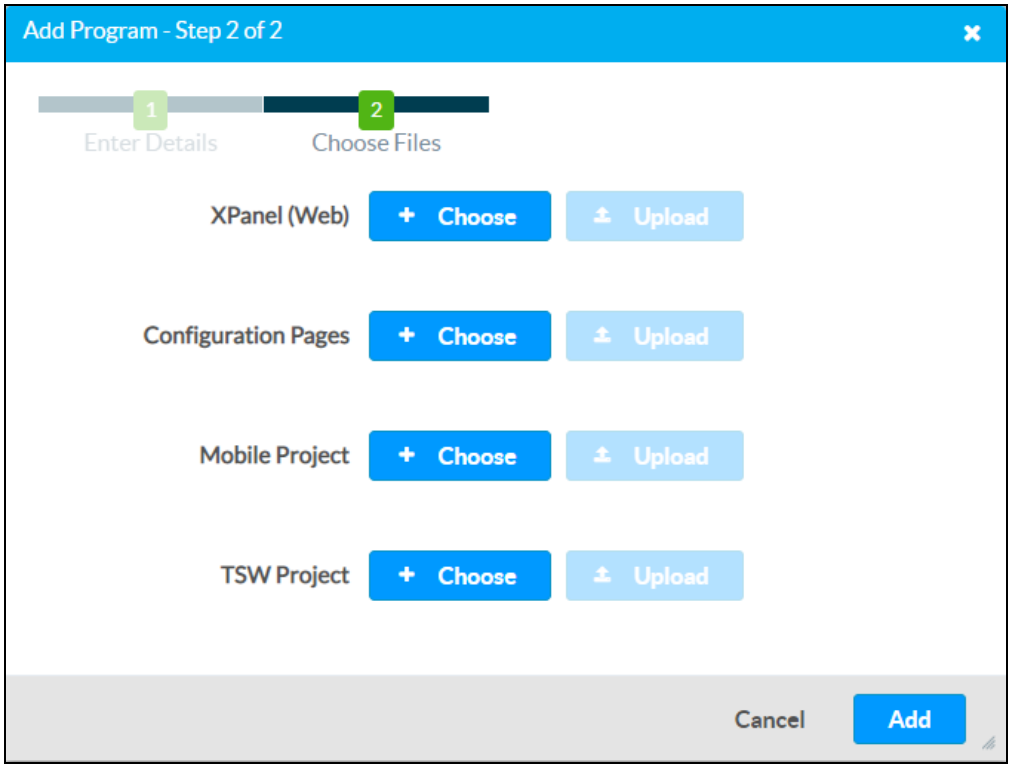
> **NOTE:** HTML5 Web XPanel is compatible only with Crestron Virtual Control installations on Red Hat® server platforms.

Load the HTML5 Web XPanel Project

HTML Web XPanel projects are created using the same scripts and components as Crestron HTML5 User Interface (CH5) projects with the addition of the required HTML Web XPanel library and configuration. For more information on creating and deploying a HTML5 Web XPanel project to the .AV Framework controller, refer to the Crestron HTML5 User Interface Developer Microsite.

Once a .ch5z archive file has been created for the HTML5 Web XPanel project, it can be loaded directly to the .AV Framework program files in Crestron Virtual Control using the **XPanel (Web)** option in the **Add Program** dialog box. The .ch5z archive file replaces the Web XPanel interface ZIP file included with the .AV Framework software package.

Add Program Dialog Box - Choose Files



For more information on loading files to the .AV Framework program in Crestron Virtual Control, refer to Setup on page 11.

Configure PAM Authentication

PAM (Pluggable Authentication Module) must be configured for the Crestron Virtual Control installation before the HTML5 Web XPanel interface can be accessed. For more information, refer to the Crestron Virtual Control Server Software Product Manual.

Access the HTML5 Web XPanel Interface

To access the HTML5 Web XPanel interface, navigate to the standard XPanel URL within the Crestron Virtual Control room running the .AV Framework program:

> **NOTE:** Crestron recommends using fully-qualified domain names (FQDNs) in place of IP addresses when opening the HTML5 Web XPanel project, as this is required to prevent a certificate security warning from displaying in the web browser.

Refer to the following example URL:

https://[domain.hostname]/VirtualControl/Rooms/[room_id]/XPanel/index.html

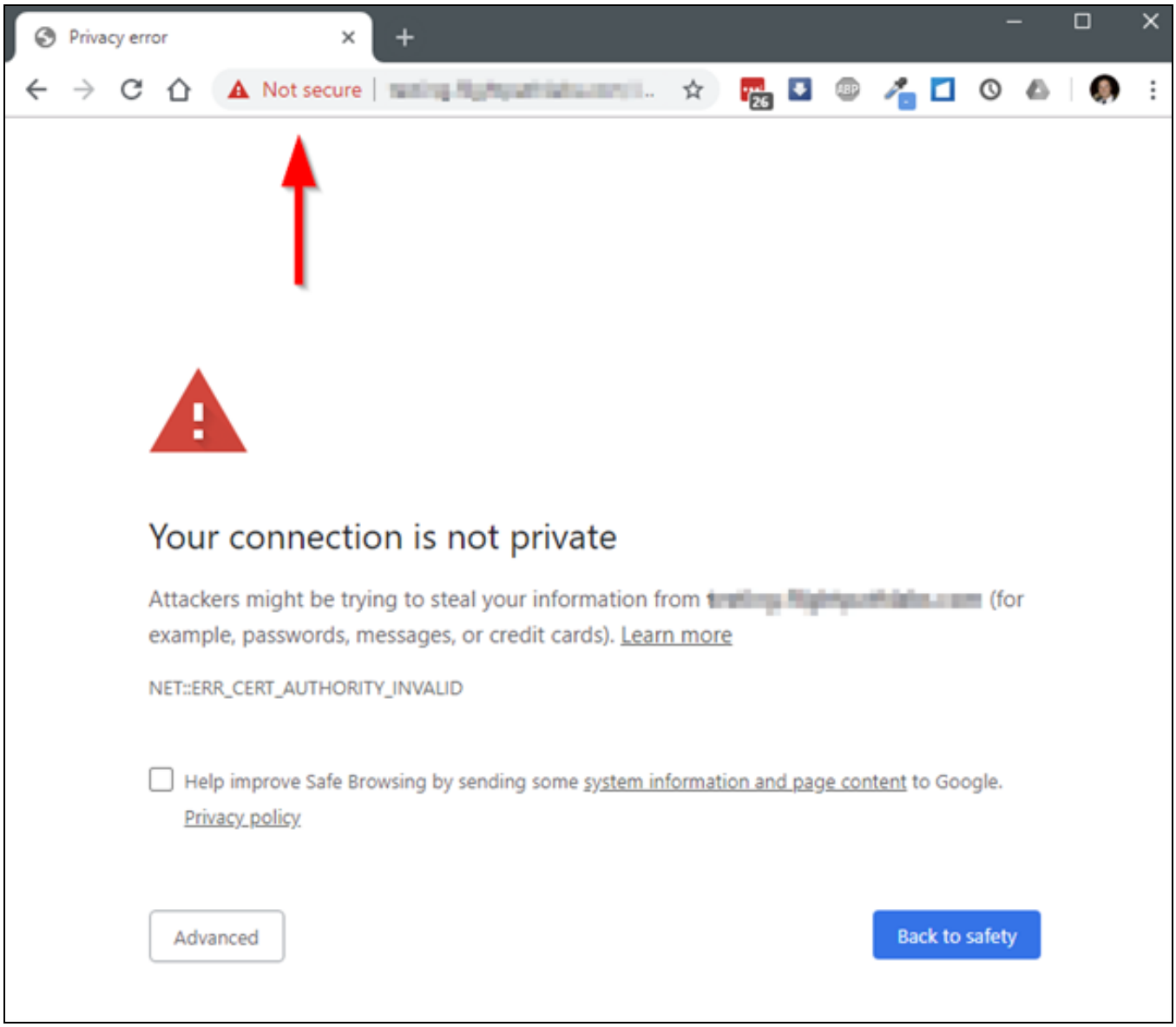
The default IP ID for the Web XPanel interface is 4. If the IP ID has been changed to a different value, append "?ipid=[ip_id]" to the end of the Web XPanel URL for the Crestron Virtual Control room running .AV Framework, where [ip_id] is the chosen IP ID value.

Refer to the following example URL:

https://[domain.hostname]/VirtualControl/Rooms/[room_id]/XPanel/index.html?ipid=3

All browsers supported by HTML5 Web XPanel will provide warning messages upon connecting to the browser if the .AV Framework controller uses a self-signed certificate.

An example from the Chrome® browser is shown below:



This behavior is expected. There are three solutions that can be used to address this.

- Use a CA-signed certificate for the .AV Framework controller and associated web server (preferred method).
- Your IT Administrator extracts the self-signed certificates from your .AV Framework controller and web server and then installs them onto your works

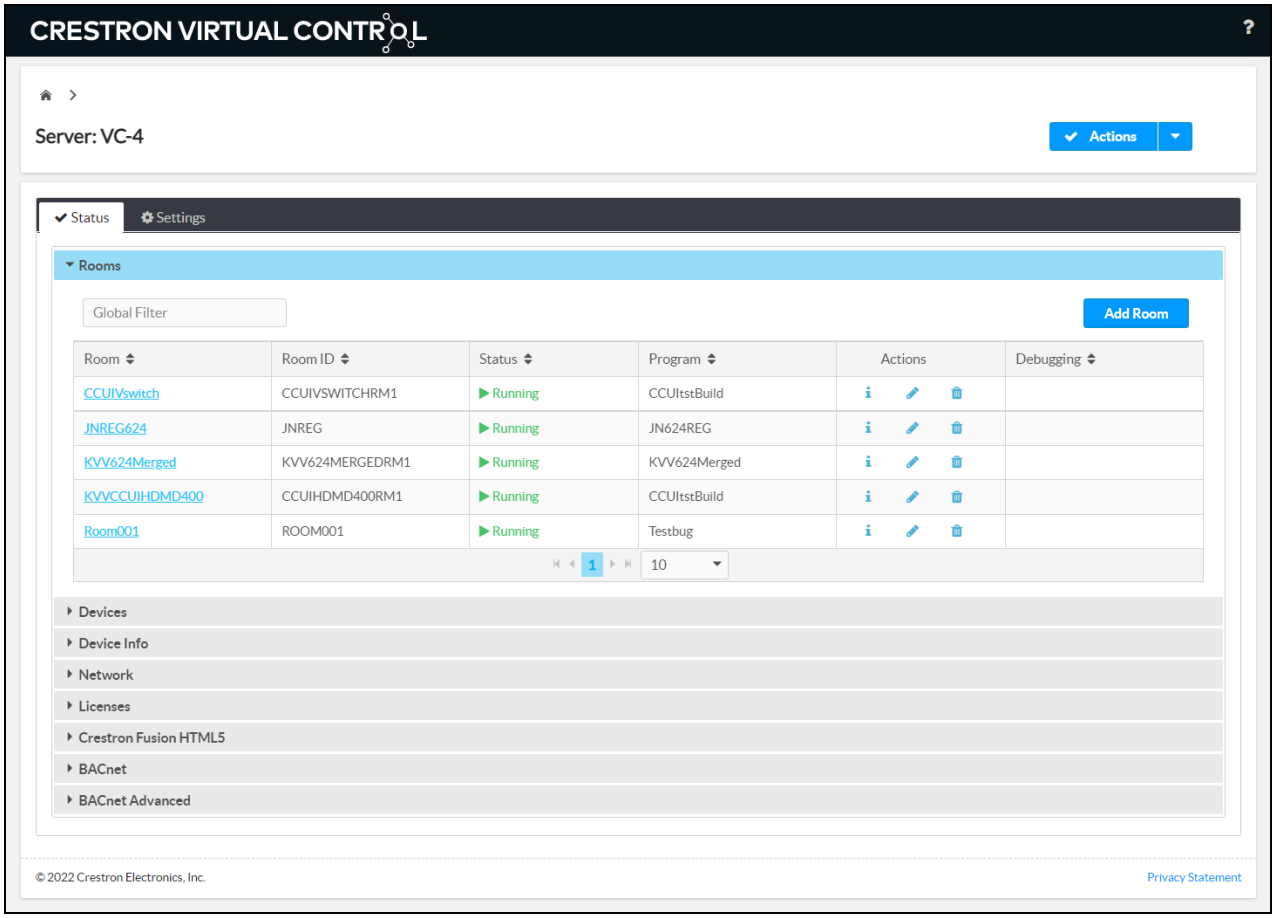
Desktop XPanel Configuration

The Desktop XPanel software can be downloaded and installed from the .AV Framework web configuration interface for legacy SmartGraphics UI projects. The **Webx** touch screen device must be added to the .AV Framework system to use the Desktop XPanel software. The **UCWebXpanel** touch screen device is also provided that allows the .AV Framework system to connect to a UC-ENGINE user interface via XPanel.

To configure a virtual touch screen project with Desktop XPanel from the Crestron Virtual Control web interface:

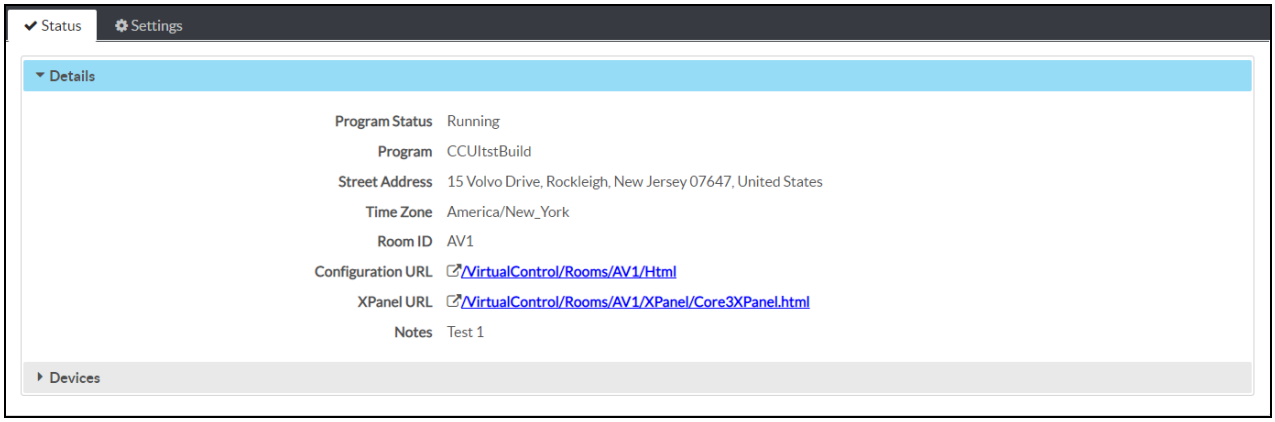
1. Select the **Status** tab.
2. Select **Rooms** to expand the **Rooms** section.

Status Tab - Rooms



3. Select the information button ℹ under the **Actions** column for the room that is running the .AV Framework program. The **Status** > **Details** page for the room is displayed.

   Status Tab - Details

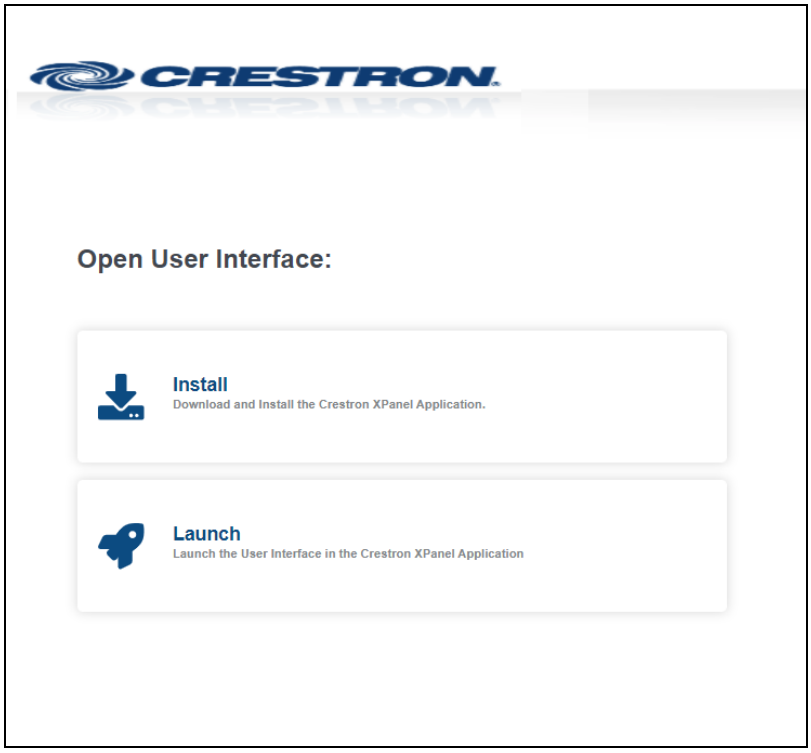


4. Select the link next to **XPanel URL**.

> **NOTE:** To display the AVF 1.0 or AVF 2.0 user interfaces on the Desktop XPanel, the corresponding AVF UI XPanel .zip file must be loaded to the .AV Framework program. To use a different UI version, simply load the desired AVF UI XPanel .zip file to the program, which will overwrite the existing version. For more information, refer to Load the Program Files on page 11.

A Desktop XPanel configuration page is displayed.

Desktop XPanel Configuration Page

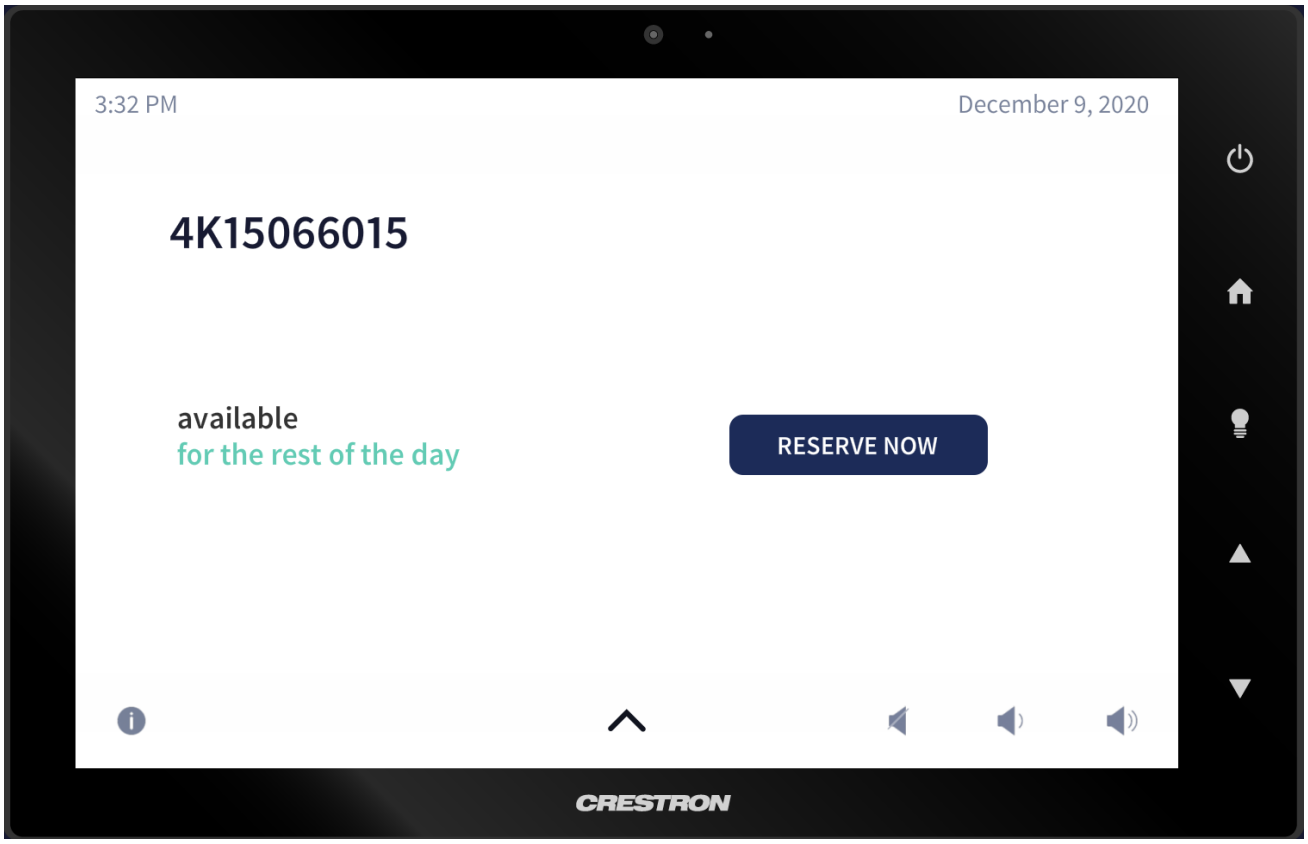


5. Select **Install** to download a Desktop XPanel .exe file.

   > **NOTE:** The Desktop XPanel software must be installed only once. Desktop XPanel can be launched from the web browser for any .AV Framework controller or system after the software is installed.

6. Open the Desktop XPanel .exe file and follow the prompts to install Desktop XPanel onto your workstation.
7. Once Desktop XPanel is installed, return to the Desktop XPanel configuration page using the URL specified in step 5.
8. Select **Launch**. Upon successful connection, the Desktop XPanel software opens with the .AV Framework user project running.

AVF 2.0 UI on Desktop XPanel Software



All touch screen project functions and screens can be tested through the XPanel interface. Additionally, the virtual touch screen hard buttons (except for the center lightbulb button) provide the same functionality as a physical touch screen.

> **NOTE:** Only one instance of the Desktop XPanel software can be running at any given time.

AM-100/AM-101

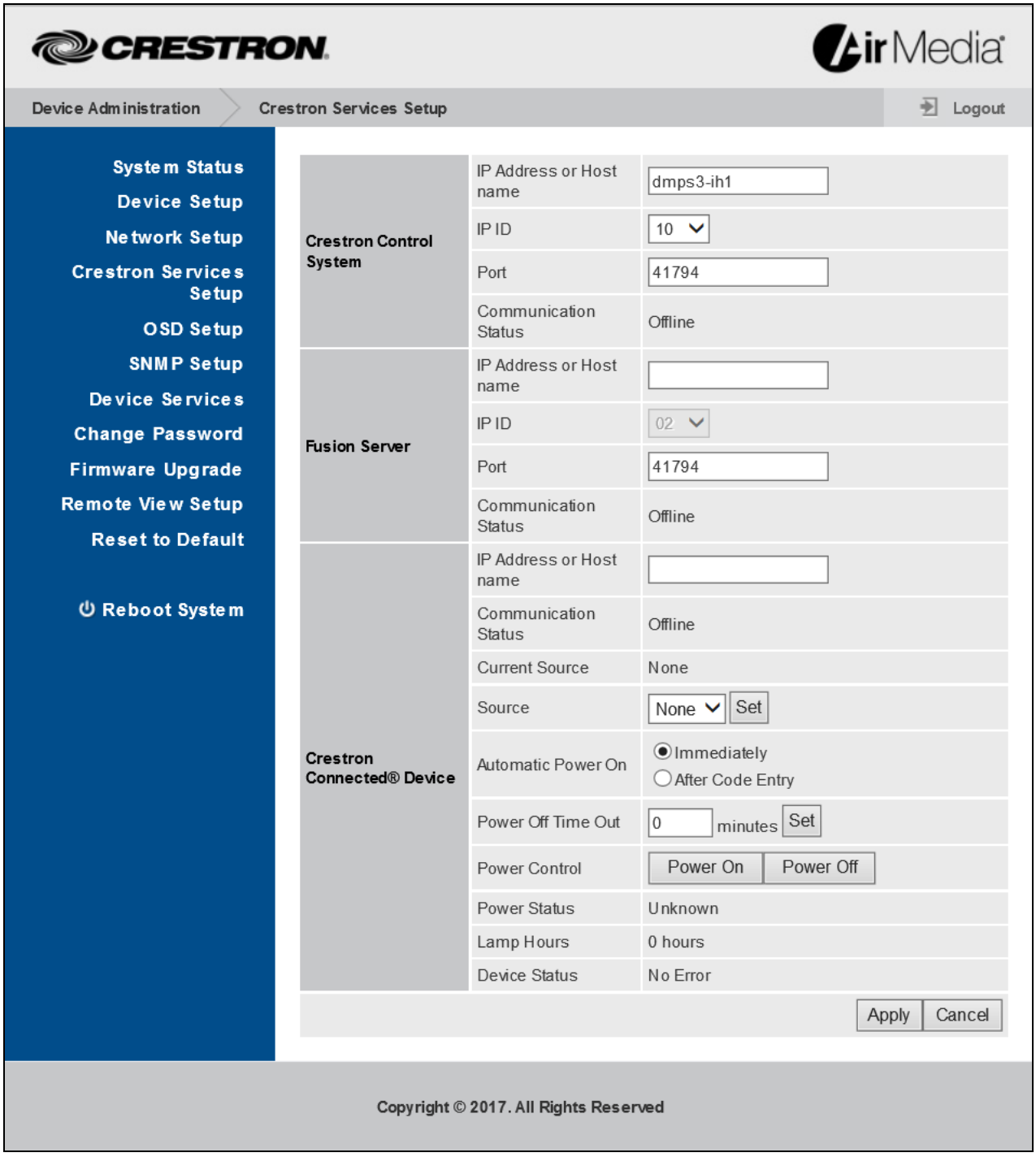
Connect a Crestron AM-100 or AM-101 AirMedia presentation gateway to the .AV Framework system to present wireless content on a display output.

To connect an AM-100 or AM-101:

1. Use a web browser to connect to the AirMedia device IP address.
2. Select **Device Administration** to display the login page.
3. Log in to the configuration utility. The default password is "admin."

4. Select **Crestron Services Setup** from the column on the left side of the page.

Device Administration - Crestron Services Setup



5. Enter the IP address of the Crestron Virtual Control server in the **Crestron Control System** section.
6. Set an IP ID used to connect to the Crestron Virtual Control server device.
7. Set the Port to 41794.

8. Select **Apply**.

MPC3/MP-B10/MP-B20

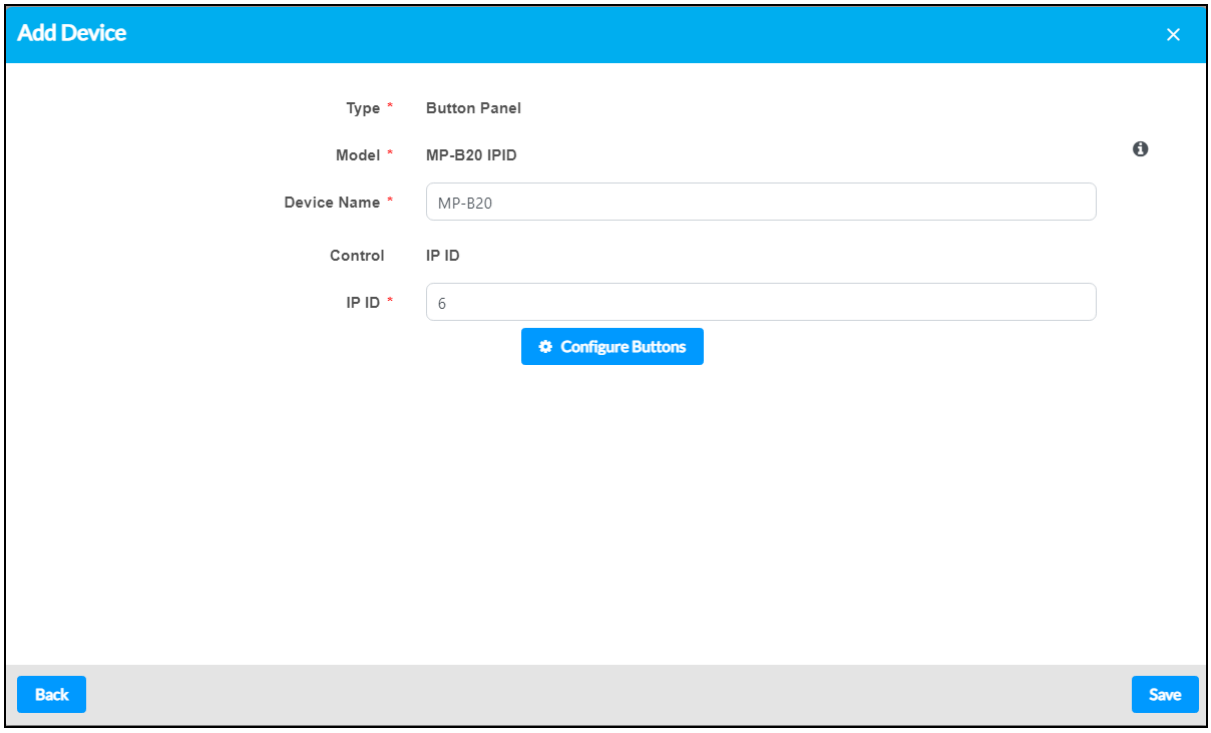
Connect a Crestron MPC3 device or MP-B10/MP-B20 media presentation button panel to the .AV Framework system in place of a touch screen for device routing and source control.

NOTE: Observe the following points when connecting a button panel:

- Before connecting a MPC3 button panel to an .AV Framework system on a Crestron Virtual Control (VC-4) server, use the Text Console tool in Crestron Toolbox™ software to issue the `VCSERVERADDR [VC4 IP]` console command to the MPC3 device, where [VC4 IP] is the IP address of the VC-4 server.
- No more than two button panels can be added to the same configuration.
- If .AV Framework is powered off from the button panel, power on functionality is turned off until after a 30-second period has elapsed.
- If .AV Framework is controlled using a button panel and a connected display device requires a warm-up or cool-down period, button panel functions are turned off until the warm-up or cool-down period has completed.

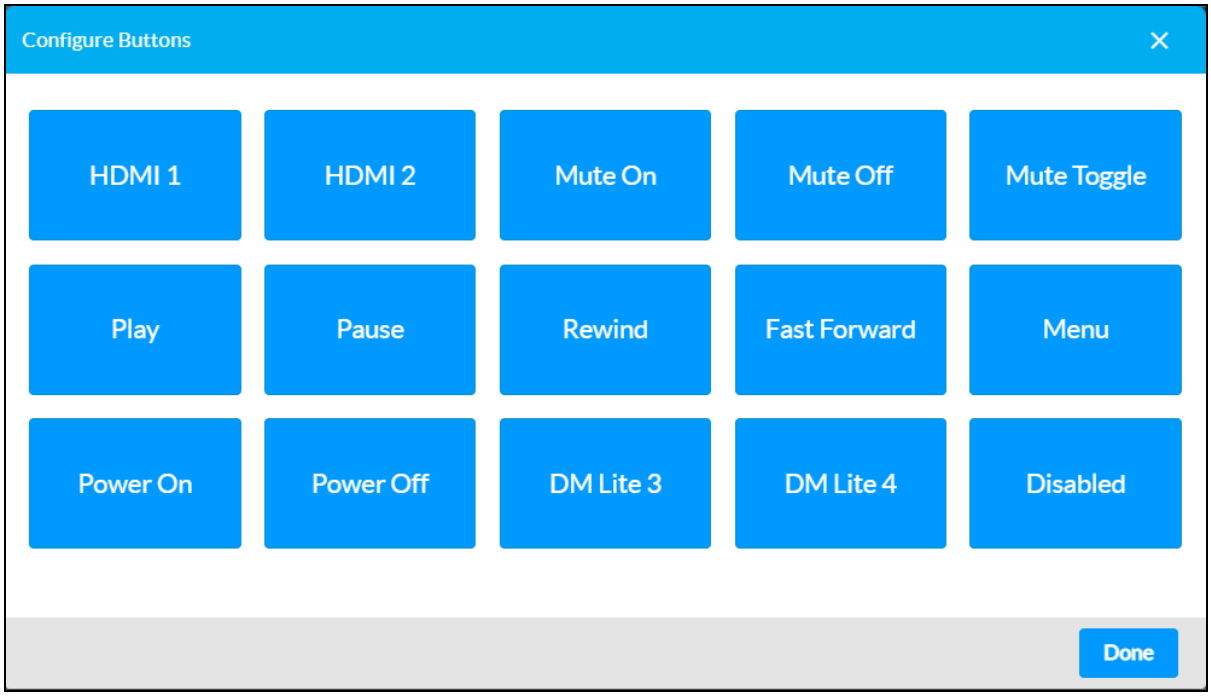
The .AV Framework configuration utility also provides screens that can be used to configure each button individually. When adding or editing a button panel, select **Configure Buttons**.

Add New Device - Button Panel



The **Configure Buttons** dialog box is displayed.

Configure Buttons Dialog Box - MP-B20



Each button on the button panel can be configured by selecting its respective button in the **Configure Buttons** dialog box. A drop-down menu is displayed when a button is selected.

> **NOTE:** Button mapping support is also provided for the permanent capacitive buttons on the MPC3 devices (Volume, Mute, and Power). However, these button functions cannot be modified.

Select one of the switcher device input channels from the drop-down menu to map that input to the button, or select one of the provided functions to map that function to the button. Media presets and lighting scenes can also be selected and mapped to buttons. For more information, refer to Media Presets on page 86 and Lighting on page 88.

> **NOTE:** When using the MP-B20 for source control, the device's 5-way navigation pad is only functional when an appropriate source device input, such as a Blu-ray Disc player or a media server, is selected. Each button on the navigation pad is mapped to the appropriate function on the selected device's menu.

The default input names for the switcher device inputs can be customized in the configuration utility. For more information, refer to Configuration on page 39.

Select **Done** to save any changes and to exit the **Configure Buttons** dialog box.

Crestron Fusion

Connect to Crestron Fusion software to monitor and control basic room data, system power, source selection, and room scheduling.

Connect to Crestron Fusion

To connect with Crestron Fusion:

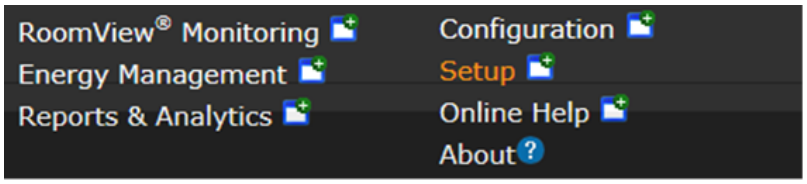
1. Log in to the Crestron Fusion server.
2. From the Crestron Fusion header tab, select **Open**.

   Crestron Fusion Cloud Header Tab



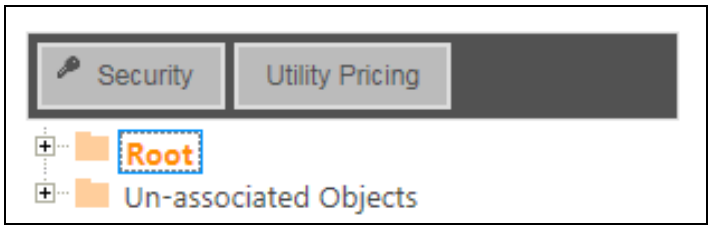
3. From the pull-down tab, select **Setup**.

   Pull-Down Tab



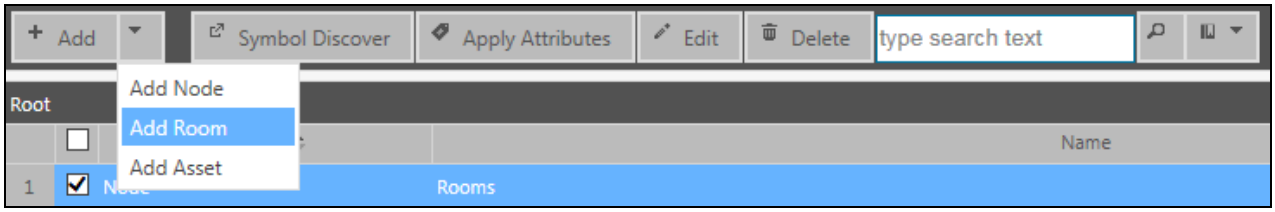
4. Select the plus (**+**) symbol next to **Root** node to expand the tree. Select the **Rooms** node to select the node.

   Root Node



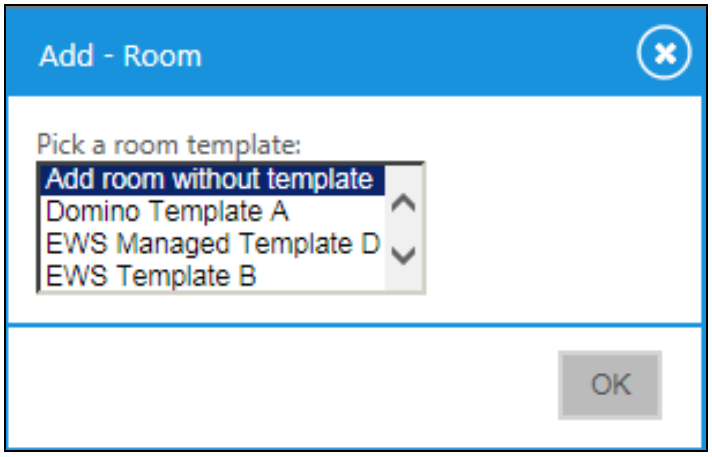
5. Select **Add**. From the drop-down list, select **Add Room**.

   Add Drop-Down List



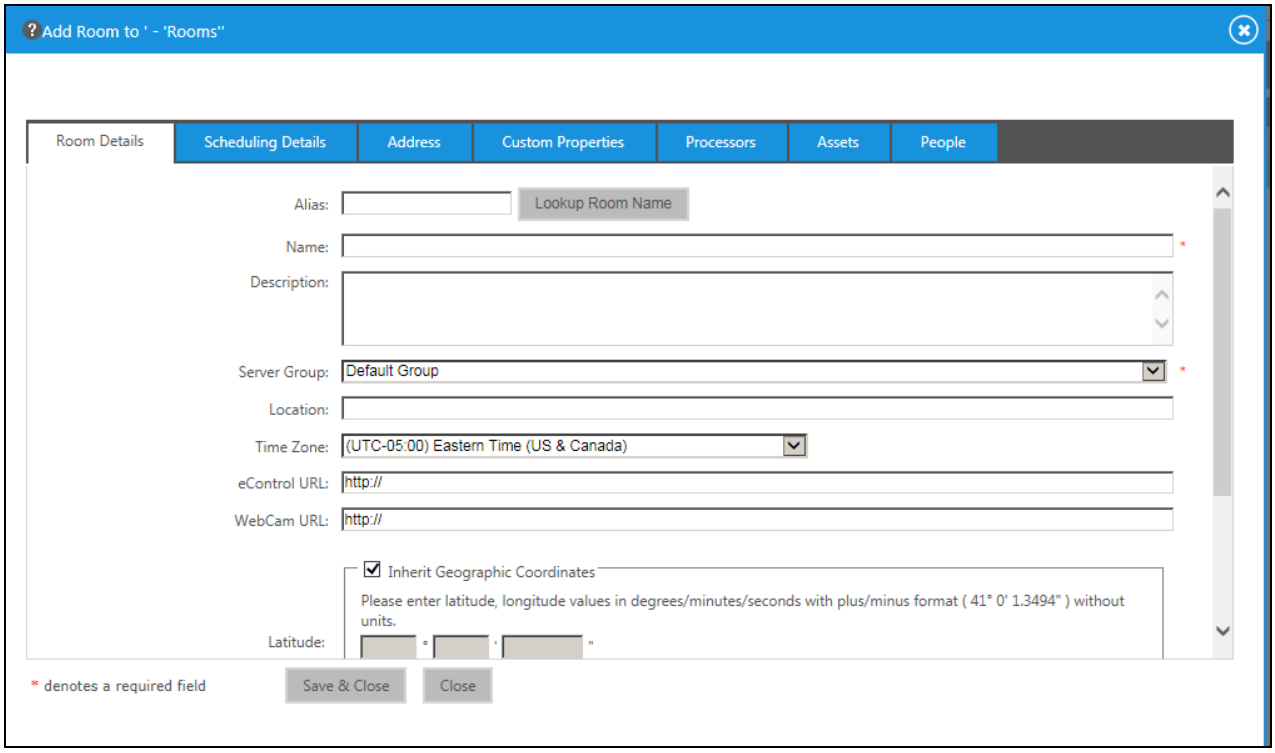
The **Add - Room** dialog box opens.

Add - Room Dialog Box



6. From the drop-down list, make a selection and then select **OK**. The **Add Room to 'Rooms'** dialog box opens with the **Room Details** tab selected.

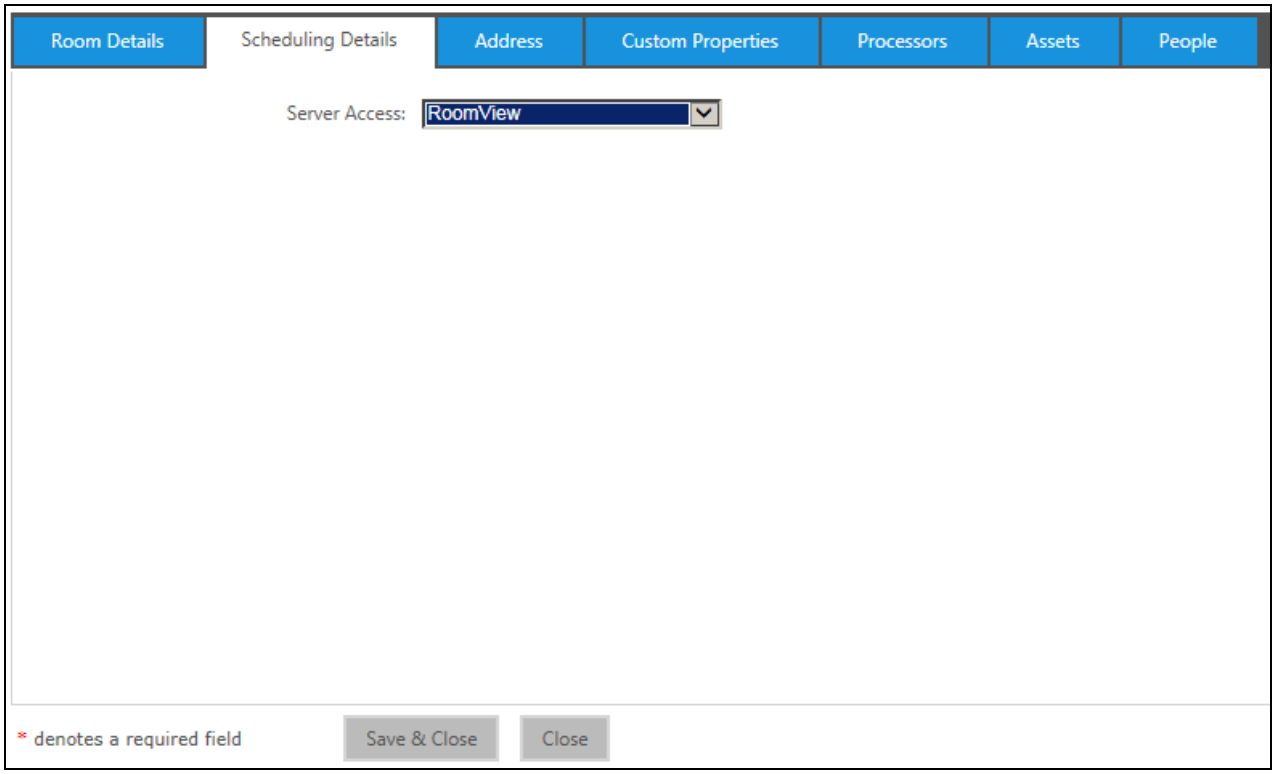
Room Details Tab



7. Enter information into the required fields as indicated by the red asterisks. Enter optional information as desired.

8. Select the **Scheduling Details** tab.

Scheduling Details Tab

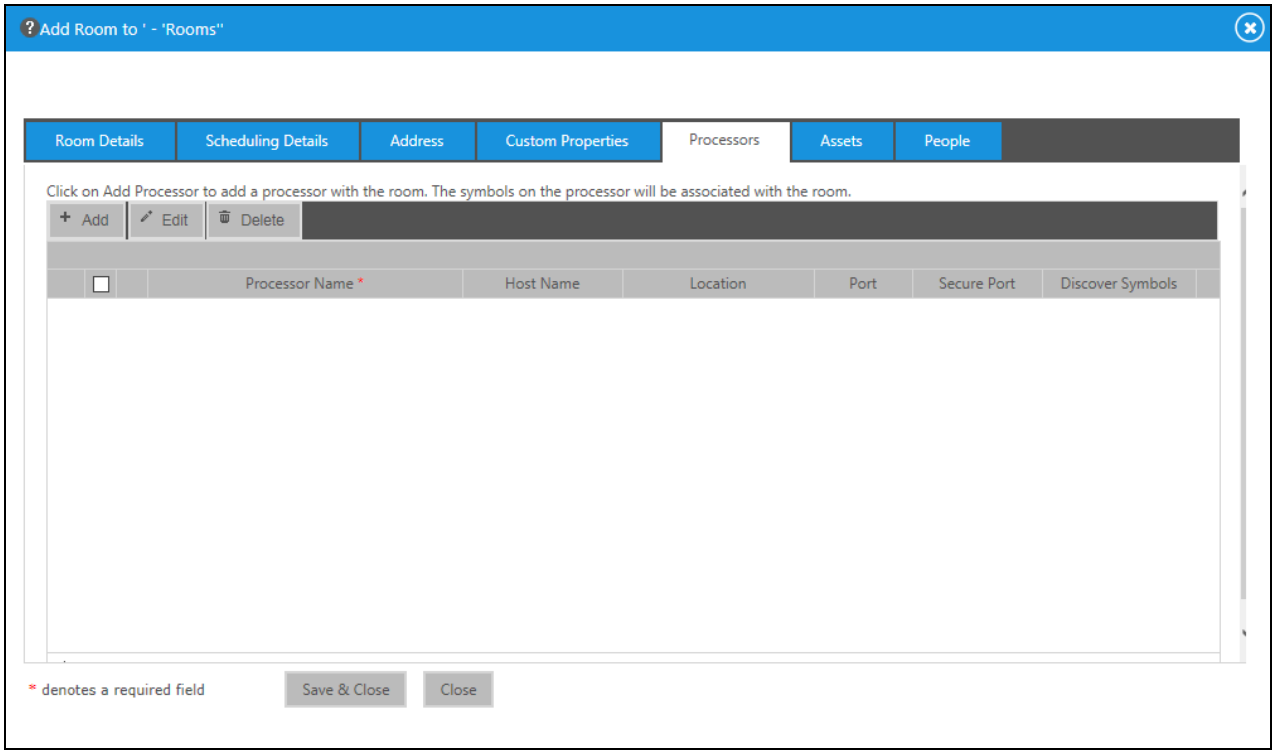


9. In the **Server Access** field, select the RoomView® scheduling application.

> **NOTE:** The user may change to another scheduling calendar later.

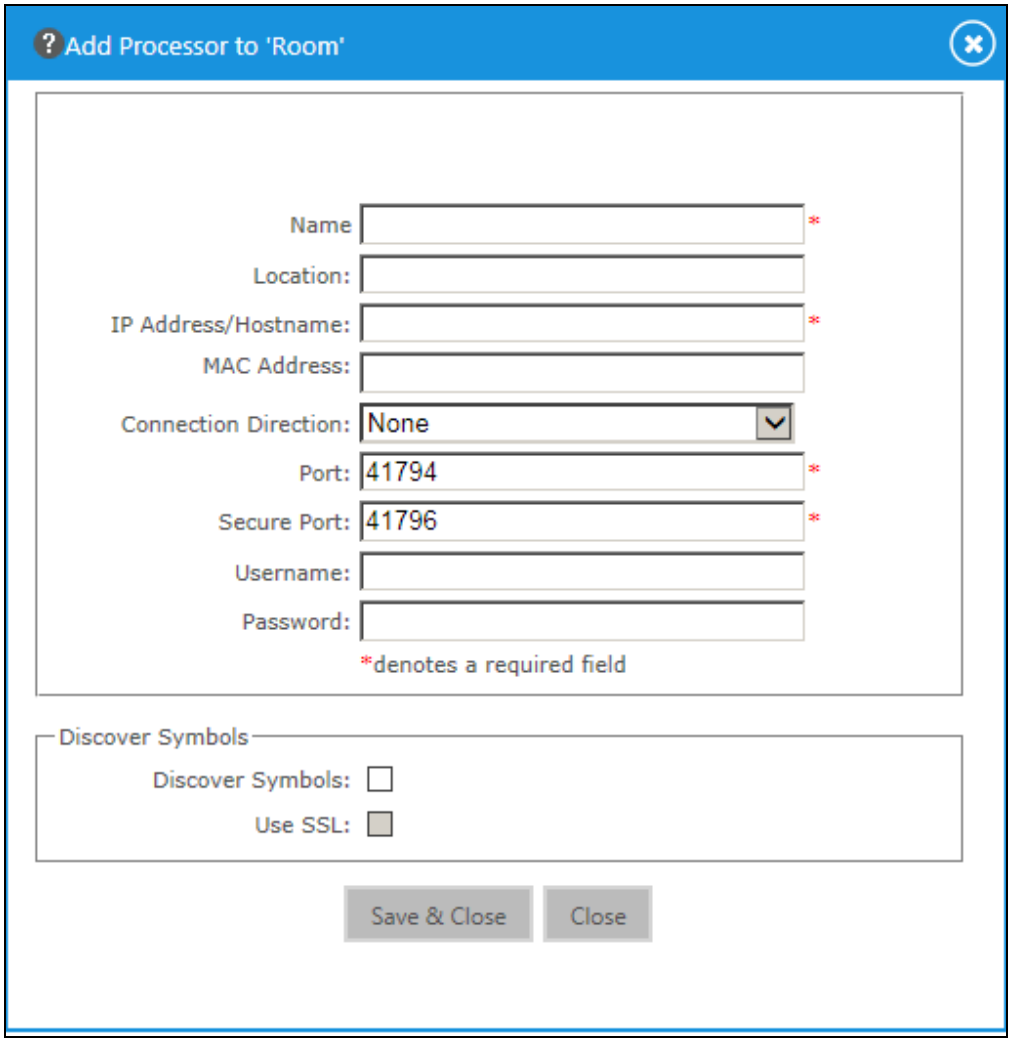
10. Select the **Processors** tab, and then select **Add**.

Processors Tab



The **Add Processor to 'Room'** dialog box opens.

Add Processor to 'Room' Dialog Box



11. Enter the processor information into the required fields as indicated by the red asterisks. Enter optional information as desired.
12. Select the **Discover Symbols** check box.

    NOTE: If the **Discover Symbols** check box is selected in the **Add Processor to 'Room'** dialog box and the control program symbol being used is version 7.2 or higher, the Symbol Discover feature automatically imports the symbol information into the Crestron Fusion database.

13. Select the **Use SSL** check box if **Discover Symbols** was selected and if the processor is configured for Secure CTP Toolbox connections only.

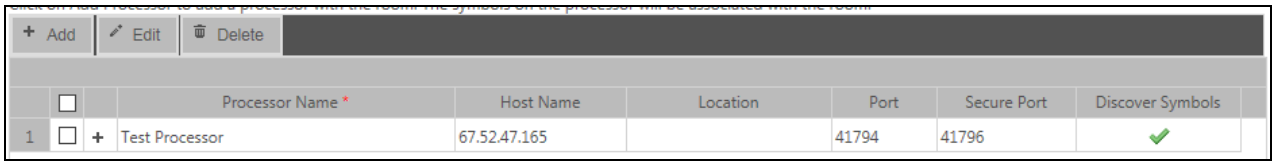
    NOTE: In the Crestron SystemBuilder™ and D3 Pro® platforms, the Symbol Discover feature is not supported on symbols below version 7.2.

14. Select **Save & Close**.

NOTE: Steps 15 through 21 are not necessary if the **Discover Symbols** check box is selected in the **Add Processor to 'Room'** dialog box.

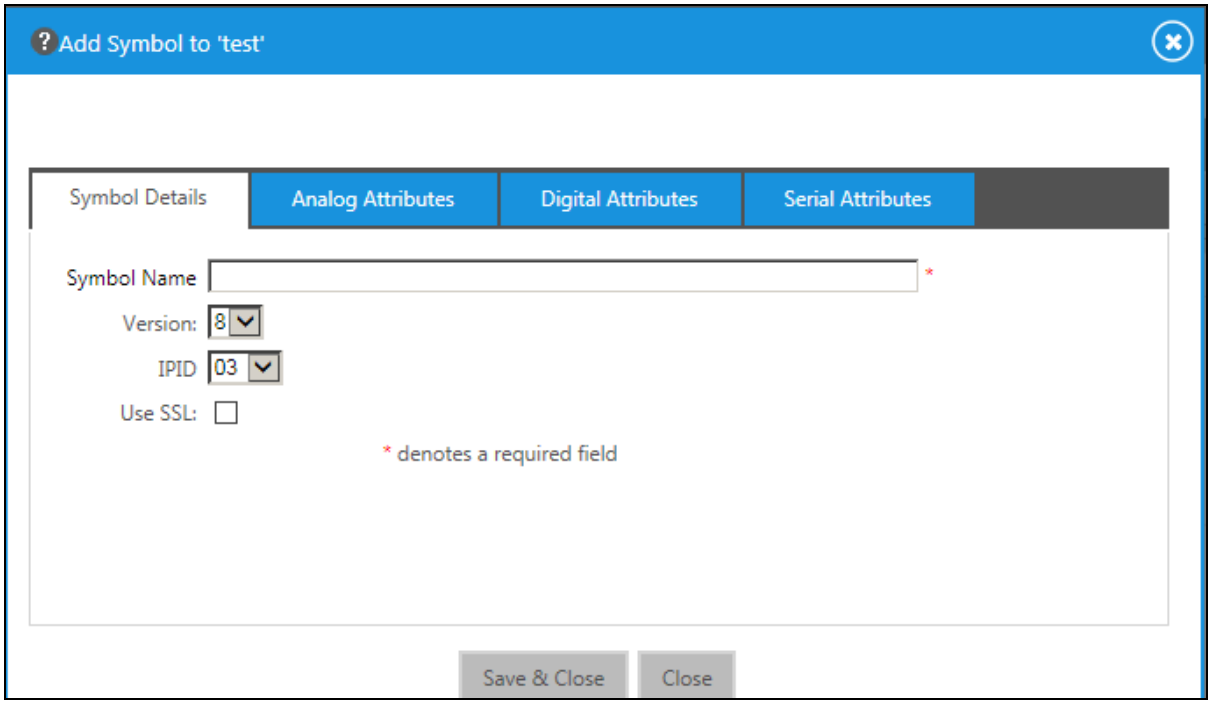
15. Select the plus (+) symbol next to the processor name to add, edit, or delete a symbol.

Add, Edit, or Delete Symbol



16. Select **Add**. The **Add Symbol to 'New Processor'** dialog box opens with the **Symbol Details** tab selected.

Symbol Details Tab



17. In the **Symbol Name** field, enter a name. Enter optional information as desired.
18. Set the **Version** and the **IPID** to match the Crestron Fusion symbol in the program.

NOTE: The version 8 symbol is the same as the Crestron Fusion Room symbol in SIMPL. If using SystemBuilder or D3 Pro, select the version 6 symbol.

19. Select the **Use SSL** check box if the processor is configured for Secure CIP connections only.
20. Select **Save & Close** to save the symbol; select **Save & Close** again to save the room.

NOTE: To associate the room with a node other than the selected **Rooms** node, select and drag the new room to that node.

Room Control and Monitoring

Room monitoring and control in Crestron Fusion use the following attributes.

System Monitors (Read Only)

Type	Function
Serial	Crestron Fusion Error Message
Serial	Crestron Fusion Log Text
Serial	Crestron Fusion Device Usage

Controller (Read Only)

Type	Function
Serial	Name
Serial	Hostname
Serial	IP Address
Serial	Subnet Mask
Serial	Default Router
Digital	Connected

Environment (Read Only)

Type	Function
Analog	System Volume

Environment (Read/Write)

Type	Function
Digital	System Power
Digital	System Mute

Switch (Read Only)

Type	Function
Serial	Display Name
Serial	Model
Serial	Input Channels Enabled
Serial	Output Channels Enabled
Serial	Input 1 Name

Type	Function
Serial	Input 2 Name
Serial	Input 3 Name
Serial	Input 4 Name
Serial	Input 5 Name
Serial	Input 6 Name
Serial	Input 7 Name
Serial	Input 8 Name
Serial	Input 9 Name
Serial	Input 10 Name
Serial	Output 1 Name
Serial	Output 2 Name
Serial	Output 3 Name
Digital	Connected

Monitor the assets connected to the room with the following attributes:

TSW-752/TSW-1052 (Read Only)

Type	Function
Digital	Connected

TSW-760/TSW-1060 (Read Only)

Type	Function
Digital	Connected

Flat Panel Display (Read Only)

Type	Function
Digital	Connected

Blu-ray Disc Player (Read Only)

Type	Function
Digital	Connected

AM-100/AM-101 (Read Only)

Type	Function
Digital	Connected

AM-200/AM-300 (Read Only)

Type	Function
Digital	Connected

MP-B10/MP-B20 (Read Only)

Type	Function
Digital	Connected

Cable TV Receiver (Read Only)

Type	Function
Digital	Connected

Projector (Read Only)

Type	Function
Digital	Connected

Video Server (Read Only)

Type	Function
Digital	Connected

Appendix B: Device Configuration

Each device that is compatible with .AV Framework for the Crestron Virtual Control server has specific fields that must be configured when the device is added to the system. The tables below provide information about the various configuration fields associated with each device class. Not all fields may be listed for drivers that support custom configuration parameters.

NOTE: As of .AV Framework version 6.31, the **Model** field is populated automatically when adding the device from the **Add Device** dialog box. The **Model** supported values in the tables below are provided as a reference to show all possible models per device class (where applicable).

AirMedia

Add New Device Fields - AirMedia

Field	Description	Supported Values
Device Name	The user defined AirMedia device name	
Model	The AirMedia device model name	**AM-100**, **AM-101**, **AM-200**, **AM-300**, **AM-3100**, **AM-3200**
Control	The transport method used for device control	**IP ID**
IP ID	The IP ID of the AirMedia device	

NOTE: The AM-200, AM-300, and AM-3200 can be added to the system as a source device or as an A/V switcher device.

Audio Mixer

Add New Device Fields - Audio Mixer

Field	Description	Supported Values
Device Name	The user defined audio mixer name	
Model	The audio mixer model name	[Any supported audio mixer]
IP	The audio mixer IP address on the network	
Input Channels	The name and mute behavior for supported audio mixer input channels	

Field	Description	Supported Values
Output Channels[1]	The name and primary audio behavior for supported audio mixer output channels	

[1] A maximum of two output channels can be selected for control. Once two output channels are selected, the **Primary Audio Enabled** toggle for all other output channels is grayed out and cannot be selected until an active channel is deselected.

Blu-ray™ Player

Add New Device Fields - Blu-ray™ Player

Field	Description	Supported Values
Device Name	The user defined Blu-ray player name	
Model	The Blu-ray player model name	[Any supported Blu-ray player]
Control	The transport method used for device control	**IP**
IP	The Blu-ray player IP address on the network	
Port	The Blu-ray player web port	

Button Panel

Add New Device Fields - Button Panel

Field	Description	Supported Values
Device Name	The user defined button panel name	
Model	The button panel model name	**MP-B10 Cresnet Bus**[1], **MP-B10 IPID**, **MP-B20 Cresnet Bus**[1], **MP-B20 IPID** , **MPC3-101 Button Mode**[2], **MPC3-102 Button Mode**[2], **MPC3-201 Button Mode**[2], **MPC3-302 Button Mode**[2]
Control	The transport method used for device control	**IP ID**, **Cresnet Bus**
IP ID[3]	The IP ID used to connect the button panel to the server	
Gateway Bus[4]	The bus that the button panel is connected to on the Cresnet gateway	

[1] This value is provided only when a Cresnet gateway has been added to the system.

[2] Transport settings are configured on the MPC3 device when placed in button-only mode.

[3] This field is provided when **MP-B10 IPID**, **MP-B20 IPID**, **MPC3-101 Button Mode**, **MPC3-102 Button Mode**, **MPC3-201 Button Mode**, or **MPC3-302 Button Mode** is selected for **Model**.

[4] This field is provided when **MP-B10 Cresnet Bus** or **MP-B20 Cresnet Bus** is selected for **Model**.

NOTE: The **Add New Device** dialog box also provides a **Configure Buttons** selection when **Button Panel** is selected as the device type, which can be used to configure individual buttons on the button panel. For more information, refer to MPC3/MP-B10/MP-B20 on page 130.

Cable Caddy

Add New Device Fields - Cable Caddy

Field	Description	Supported Values
Device Name	The user defined cable caddy name	
Model	The cable caddy model name	**TT-100 Cresnet Bus**[1]
Control	The transport method used for device control	**Cresnet Bus**
Default Source[2]	The default input source used by the cable caddy	[Any available input of the appropriate type in the system]
Secondary Source[2]	The secondary input source used by the cable caddy	[Any available input of the appropriate type in the system]
Gateway Bus[3]	The bus that the cable caddy is connected to on the Cresnet gateway	

[1] This value is provided only when a Cresnet gateway has been added to the system.
[2] The cable caddy attempts to create a route from the default source first. If the cable caddy cannot create a route from the default source, it automatically switches to the secondary source.
[3] This field is provided when **TT-100 Cresnet Bus** is selected for **Model**.

Cable TV

Add New Device Fields - Cable TV

Field	Description	Supported Values
Device Name	The user defined cable TV receiver name	
Model	The cable TV receiver model name	[Any supported cable TV receiver]
Control	The transport method used for device control	**IP**
IP	The cable TV receiver IP address on the network	
Port	The cable TV receiver web port	

Camera

Add New Device Fields - Camera

Field	Description	Supported Values
Device Name	The user defined camera name	
Model	The camera model name	[Any supported camera]
Control	The transport method used for device control	**IP**
IP	The camera IP address on the network	
Port	The camera web port	
Username[1]	The username (required or optional) for initiating device control communications	
Password[1]	The password (required or optional) for initiating device control communications	

[1] These fields are provided when a device driver for a camera requires a username and password to initiate control communications.

NOTE: The camera video feed can be connected to the input of a switcher device so it can be selected from the source routing page in the user interface.

Cresnet Gateway

Add New Device Fields - Cresnet Gateway

Field	Description	Supported Values
Display Name	The user defined Cresnet gateway name	
Model	The Cresnet gateway model name	**DIN-CENCN-2**
Control	The transport method used for device control	**IP ID**
IP ID	The IP ID of the Cresnet gateway	

Crestron IO

Add New Device Fields - Crestron IO

Field	Description	Supported Values
Display Name	The user defined Crestron I/O device name	
Model	The Crestron I/O device model name	**C2N-IO Bus**[1], **CEN-IO-COM-102**, **CEN-IO-IR-104**,**CEN-IO-IR-204**, **CEN-IO-RY-104**, **CEN-IO-RY-204**, **HD-CTL-101**

Field	Description	Supported Values
Control	The transport method used for device control	**IP ID**, **Cresnet Bus**
IP ID[2]	The IP ID used to connect the Crestron I/O device to the server	
Gateway Bus[3]	The bus that the Crestron I/O device is connected to on the Cresnet gateway	

[1] This value is provided only when a Cresnet gateway has been added to the system.
[2] This field is provided when **CEN-IO-COM-102**, **CEN-IO-IR-104**, **CEN-IO-IR-204**, **CEN-IO-RY-104**, **CEN-IO-RY-204**, or **HD-CTL-101** is selected for **Model**.
[3] This field is provided when **C2N-IO Bus** is selected for **Model**.

Custom Conference Control

Add New Device Fields - Custom Conference Control

Field	Description	Supported Values
Display Name	The user defined custom conference controller name	
Model	The custom conference controller type	**Cisco Webex Room Kit Mini**, **Microsoft Teams Conferencing**, **Zoom Room Controls**, **Google Meet**

DigitalMedia Transmitter

Add New Device Fields - DigitalMedia Transmitter

Field	Description	Supported Values
Display Name	The user defined DigitalMedia transmitter name	
Model	The DigitalMedia transmitter model name	**DM-TX-201-C**[1], **DM-TX-401-C**[1], **DM-TX-4K-202-C**[1], **DM-TX-4K-302-C**[1],
Control	The transport method used for device control	**IP ID**
IP ID	The IP ID of the DigitalMedia transmitter	

[1] These models are only available if an AM-300 is selected as the A/V switcher for the system.

Flat Panel Display

Add New Device Fields - Flat Panel Display

Field	Description	Supported Values
Display Name	The user defined flat panel display name	
Model	The flat panel display model name	[Any supported display]
Control	The transport method used for device control	**CEC**, **IP ID**, **IP**, **Serial**
Default Input[1]	The default input of the flat panel display in the system	[Any available input of the appropriate type in the system]
Communications Port[2,5]	The device port that controls the flat panel display	[Any unused communication port for the selected transport method in the system]
IP ID[3]	The IP ID of the flat panel display	
IP/Hostname[4]	The flat panel display IP address or host name	
Port[4]	The flat panel display web port	
Channel[4,5]	The display Wi-Fi® network channel	
Warm Up Time[6,7]	The duration that a "warming up" message is displayed on the .AV Framework UI after the display is powered on, in seconds	[Minimum value is the default defined by the device driver; maximum value is 300 seconds]
Cool Down Time[6,7]	The duration that a "cooling down" message is displayed on the .AV Framework UI after the display is powered off, in seconds	[Minimum value is the default defined by the device driver; maximum value is 300 seconds]
User Name[8]	The username (required or optional) for initiating device control communications	
Password[8]	The password (required or optional) for initiating device control communications	

[1] This field is provided when a display that uses a transport method for device control is selected.
[2] This field is provided when a CEC-controlled display is selected for **Model**.
[3] This field is provided when a Crestron Connected controlled display is selected for **Model**.
[4] Some or all these fields are provided when an IP-controlled display is selected for **Model** and **IP/Hostname** is selected for **Control**.
[5] Some or all these fields are provided when a serial-controlled display is selected for **Model** and **Serial** is selected for **Control**.
[6] All controls on the user interface are temporarily locked out until the message times out.
[7] These fields are provided only if the display driver supports this functionality.
[8] These fields are provided when a device driver for a display requires a username and password to initiate control communications.

Microphone

Add New Device Fields - Microphone

Field	Description	Supported Values
Device Name	The user defined microphone name	

Field	Description	Supported Values
Model	The microphone model name	[Any supported microphone]
Control	The transport method used for device control	**IP**
IP	The microphone IP address on the network	
Port	The microphone web port	
Password[1]	The password (required or optional) for initiating device control communications	

[1] This field is provided when a device driver for a microphone requires a password to initiate control communications.

Occupancy Sensor

Add New Device Fields - Occupancy Sensor

Field	Description	Supported Values
Display Name	The user defined occupancy sensor name	
Model	The occupancy sensor model name	**CEN-ODT-C-POE**, **GLS-ODT-C-CN Bus**[1], **GLS-OIR-C-CN Bus**[1]
Control	The transport method used for device control	**Cresnet Bus**, **IP ID**
Gateway Bus[2]	The bus that the occupancy sensor is connected to on the Cresnet gateway	
IP ID[3]	The IP ID of the occupancy sensor	
Use Sensor Timeout	Sets whether system timeout is determined by the occupancy sensor device (For example, if **Yes** is selected, the system times out if no occupancy is detected in a room)	**Yes**, **No**
Timeout Minutes[4]	The duration in minutes that it takes for the system to time out if sensor timeout is not used	**Yes**, **No**
Turn System On	Sets whether the .AV Framework system turns on if motion is detected by the occupancy sensor device	**Yes**, **No**
Turn System Off	Sets whether the .AV Framework system turns off if no occupancy is detected by the occupancy sensor device	**Yes**, **No**
Route Default Video	Sets whether default video is routed when the occupancy sensor turns on the .AV Framework system.	**Yes**, **No**

[1] This value is provided only when a Cresnet gateway has been added to the system.
This field is provided when **GLS-ODT-C-CN** or **GLS-OIR-C-CN** is selected for **Model**.
[2] This field is provided when **GLS-ODT-C-CN Bus** or **GLS-OIR-C-CN Bus** is selected for **Model**.
[3] This field is provided when **CEN-ODT-C-POE** is selected for **Model**.
[4] This field is provided when **No** is selected for **Use Sensor Timeout**.

Projector

Add New Device Fields - Projector

Field	Description	Supported Values
Display Name	The user defined projector name	
Model	The projector model name	[Any supported projector]
Control	The transport method used for device control	**IP**, **Serial**, **IP ID**
Default Input	The default input of the projector in the system	[Any available input of the appropriate type in the system]
IP/Hostname[1]	The projector IP address or host name	
Port[1]	The projector web port	
Communications Port[2]	The device port that controls the projector	[Any unused communication port for the selected transport method in the system]
IP ID[3]	The IP ID of the projector	
Warm Up Time[4,5]	The duration that a "warming up" message is displayed on the .AV Framework user interface after the projector is powered on, in seconds	[Minimum value is the default defined by the device driver; maximum value is 300 seconds]
Cool Down Time[4,5]	The duration that a "cooling down" message is displayed on the .AV Framework user interface after the projector is powered off, in seconds	[Minimum value is the default defined by the device driver; maximum value is 300 seconds]
User Name[6]	The username (required or optional) for initiating device control communications	
Password[6]	The password (required or optional) for initiating device control communications	

[1] These fields are provided when **IP/Hostname** is selected for **Control**.
[2] This field is provided when **Serial** is selected for **Control**.
[4] All controls on the user interface are temporarily locked out until the message times out.
[5] These fields are provided only if the display driver supports this functionality.
[6] These fields are provided when a device driver for a projector requires a username and password to initiate control communications.

> **NOTE:** If the selected projector driver supports video mute, a blank projector screen is outputted to the projector when video mute is turned on.

Room Availability Hallway Sign

Add New Device Fields - Room Availability Hallway Sign

Field	Description	Supported Values
Display Name	The user defined room availability hallway sign name	
Model	The room availability hallway sign model name	**SSW/SCC/SIW Bus**[1]
Control	The transport method used for device control	**Cresnet**, **Cresnet Bus**
Gateway Bus	The bus that the room availability hallway signe is connected to on the Cresnet gateway	

[1] This value is provided only when a Cresnet gateway has been added to the system.

Touch Screen

Add New Device Fields - Touch Screen

Field	Description	Supported Values
Display Name	The user defined touch screen name	
Model	The touch screen model name	**TS/TSW-1070**, **TS/TSW-770**, **TST-1080**, **TSW-1052**, **TSW-1060**, **TSW-752**, **TSW-760**, **Webx**, **UCWebXpanel**
Control	The transport method used for device control	**IP ID**
IP ID	The IP ID of the touch screen	

NOTE: Select **Webx** using the **Model** drop-down menu when configuring a virtual touch screen project with the .AV Framework program's built-in XPanel interface. The **UCWebXpanel** selection is also provided that allows the .AV Framework system to connect to a UC-ENGINE user interface via XPanel. For more information, refer to XPanel on page 121.

Video Server

Add New Device Fields - Video Server

Field	Description	Supported Values
Display Name	The user defined video server name	
Model	The video server model name	[Any supported video sever]
Control	The transport method used for device control	**IP**, **CEC**

Field	Description	Supported Values
Communications Port[1]	The device port that controls the video server	[Any unused communication port for the selected transport method in the system]
IP[2]	The video server IP address on the network	
Port[2]	The video server web port	

[1] This field is provided when **IR** or **CEC** is selected for **Control**.
[2] These fields are provided when **IP** is selected for **Control**.

Appendix C: External Systems Integration

The external trigger system and paging integration allows for external digital events to trigger certain configured behavior within .AV Framework, such as system power off, audio mute, and paging via an external audio source.

The external events are triggered by mapping external triggers and paging source to a digital I/O input port of the HD-CTL-101. The state of the circuitry, normally opened or normally closed, should be considered to determine if the event should be triggered. The I/O port, I/O input state, and behavior are configurable for both external events and paging sources, while the Aux input and fixed volume can also be configured for paging sources.

> **NOTE:** Crestron highly recommends thorough testing and configuration of the external systems integrations to ensure proper systems operation. The installation and the use of this product within a specific installation must be approved by applicable local, state, or federal Authority Having Jurisdiction (AHJ). All installations must be performed by a qualified personnel according to applicable local and regional codes and standards. Requirements vary between jurisdictions.

Compatibility

Refer to the following table to determine compatibility between the HD-CTL-101 and external systems integration.

External Systems Compatibility Matrix

Model	Switcher Type	Supports I/O	Supports Paging with Audio Behavior	Built-In Scaler
HD-CTL-101	External	Yes	Yes[1]	N/A
AM-200/AM-300	External	N/A	N/A	No
DM-TX Series	External	N/A	N/A	No
HD-MD-XXX Series	External	No	No	No
HD-PS Series	External	No	Yes	Yes
DM NVX Series	External	No	No	Yes
Virtual Switcher	External	N/A	N/A	N/A

[1] Requires using a switcher with scaling that supports analog inputs.

Configuration Requirements

The following configuration requirements are present for external systems and paging integration:

- When external systems integration is not supported, all controls are turned off and grayed out.
- Turning off either trigger will remove the dependency on the I/O port and analog input port.
- When a required device or port is removed or deleted that is used by this external systems integration, the feature will be turned off.
- If the user changes the audio routing from **Yes** to any other setting, the system will need to be restarted.
- Selecting **Mute Audio** requires using an AMP or flat panel display/projector that supports being muted.
- Selecting **Mute Audio except for Paging** requires an output audio source that supports setting the volume with feedback and a switcher that supports analog inputs.
- Using a flat panel device or projector as the audio output source requires that the switcher supports routing an analog input to an output, that the display/projector device supports setting a volume; and that the routing configuration of **Yes with Volume Control** is set.

Trigger Behavior

The following trigger behavior is present for external systems and paging integration:

- External system triggers have a higher priority than paging triggers if both are configured. Paging will stop if an external system trigger occurs during the paging trigger.
- The trigger event is latched (opened) based on normally open or normally closed logic.
- On system restart or application restart, the trigger state will be reevaluated and trigger will be reapplied if necessary.
- The trigger will become inactive when the external A/V switcher is offline. When the external A/V switcher comes online the trigger state will be restored based on the preliminary circuit state.
- Audio mute has the same behavior as a mute button:
    - The primary audio source (for example, the Program Audio or Display Volume source) will only be muted.
    - The other routed audio (for example, Aux 1, Aux 2, and secondary displays) sources will not be muted.
    - During the trigger event, the mute state will be held and the system will not allow it to be unmuted. When the muted trigger is completed, the system will remain muted.
- System off turns on the "Always off" power mode during the duration of the trigger.
- Mute with paging stops all current routes within the system and routes the analog input to a configured audio source.
- After a system off trigger, the system will power on based on the configured power settings:
    - If set to use business hours, the system will power on during the configured time range.

- If set to use occupancy, the system will power on if occupancy is detected in the room.
- If set to use sync-based, the system will not power on and must be powered on manually.

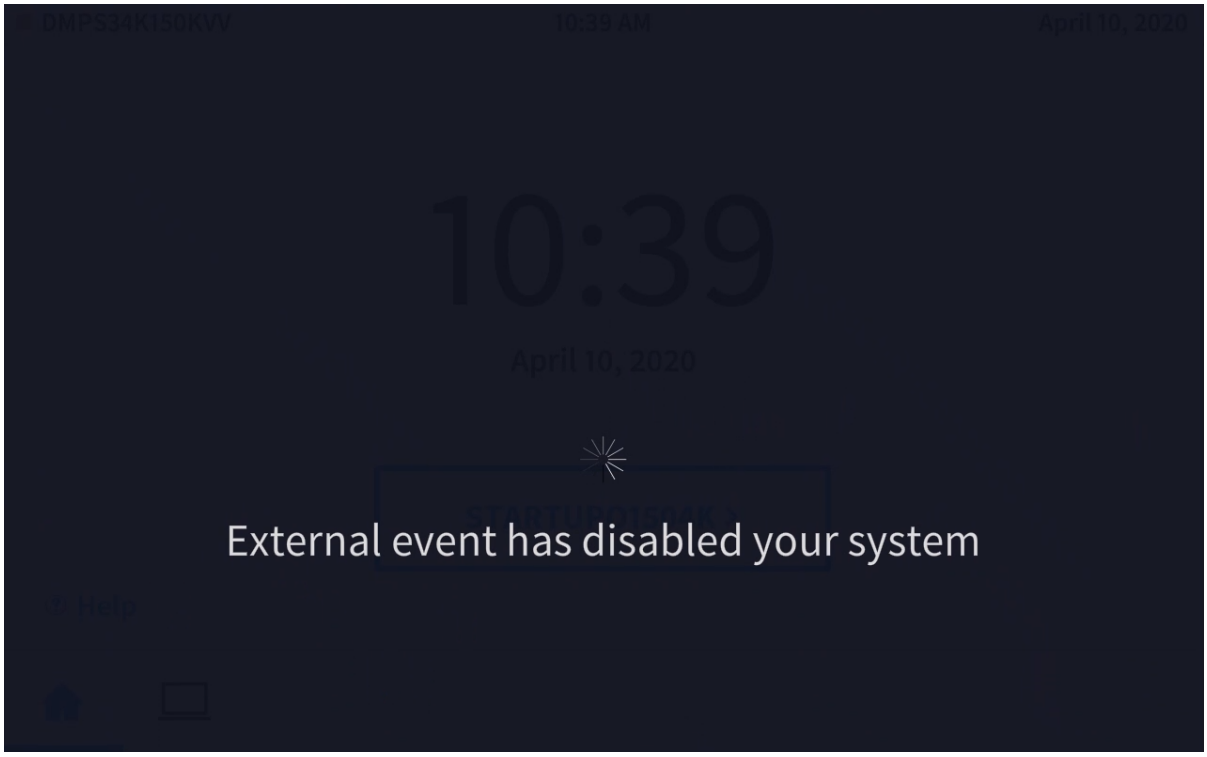
External System Considerations

The following considerations should be taken when setting up external system triggers within .AV Framework:

- The HD-CTL-101 must have an available I/O port that can be wired to the trigger.
- Normally open or normally closed logic should be chosen based on the system and the desired trigger behavior.

When an external system trigger is initiated, an "External event has disabled your system" message is displayed on the system control interface. No user actions can occur during this message and all routes are stopped.

External event has disabled your system Message



The message is displayed until the circuit logic is inverted.

Paging Considerations

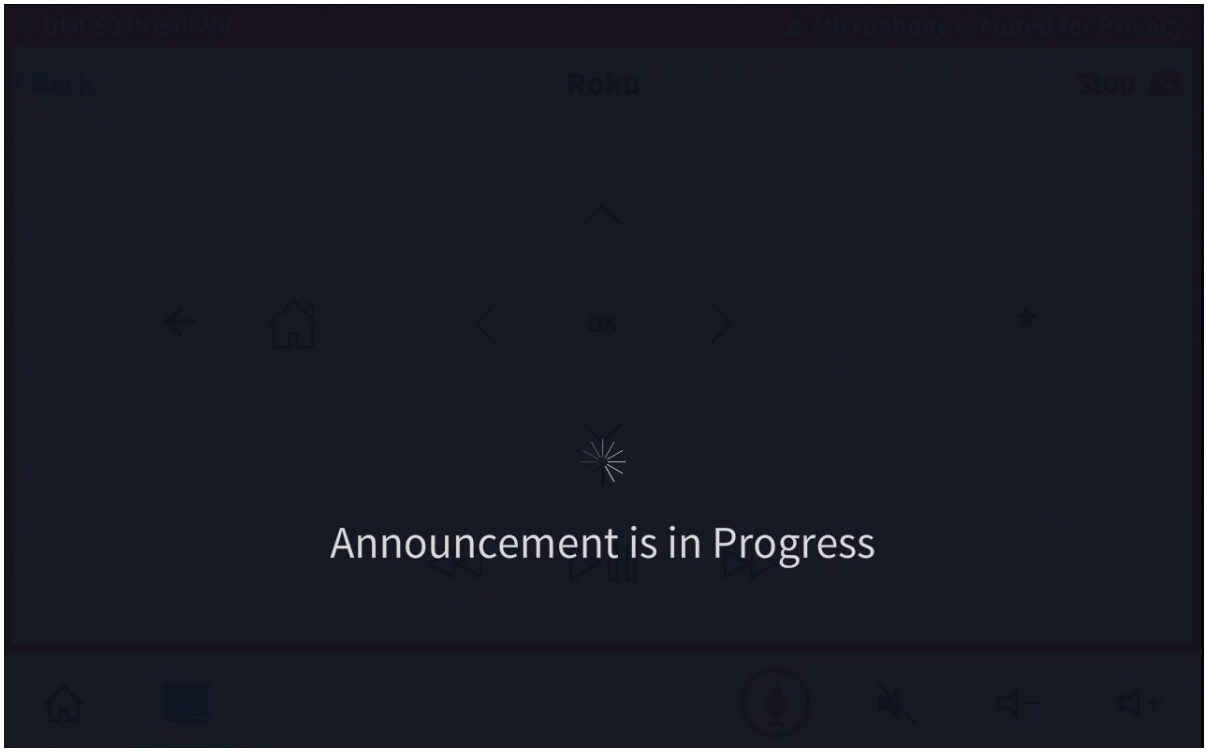
The following considerations should be taken when setting up paging triggers within .AV Framework:

- The connected A/V switcher must support analog Aux inputs.
- The system must have an internal or external amplifier that is active.

- If the system does not support an external amplifier, the A/V display or projector that is the output speaker source must support the setting volume feature, and audio routing must be set to **Yes with volume control**.
- The HD-CTL-101 must have an available I/O port that can be wired to the trigger and an available audio output that can be routed to the paging source.
- Paging only works with the HDMI outputs on the connected A/V switcher that have a scaler. Connections to DM endpoints are not supported. For devices with HDMI/DM ports, the HDMI channel will support paging and not the DM. If only the DM port of a HDMI/DM output is used, the system will allow it to be configured, but paging will not work.
- Normally open or normally closed logic should be chosen based on the system and the desired trigger behavior.

When a paging trigger is initiated, an "Announcement is in Progress" message is displayed on the system control interface. No user actions can occur during this message and all routes are stopped.

Announcement is in Progress Message



The message is displayed until the circuit logic is inverted.

Appendix D: Configure a Zoom Rooms Controller

.AV Framework provides functionality that allows for custom control buttons to be added to a Zoom Rooms controller application. These buttons are based on the inputs assigned within the .AV Framework system. .AV Framework will generate a JSON output based on the selected inputs. The output is then loaded into the Zoom Rooms controller application to create custom control buttons.

The following procedure describes how to add custom buttons to a Zoom Rooms controller using .AV Framework.

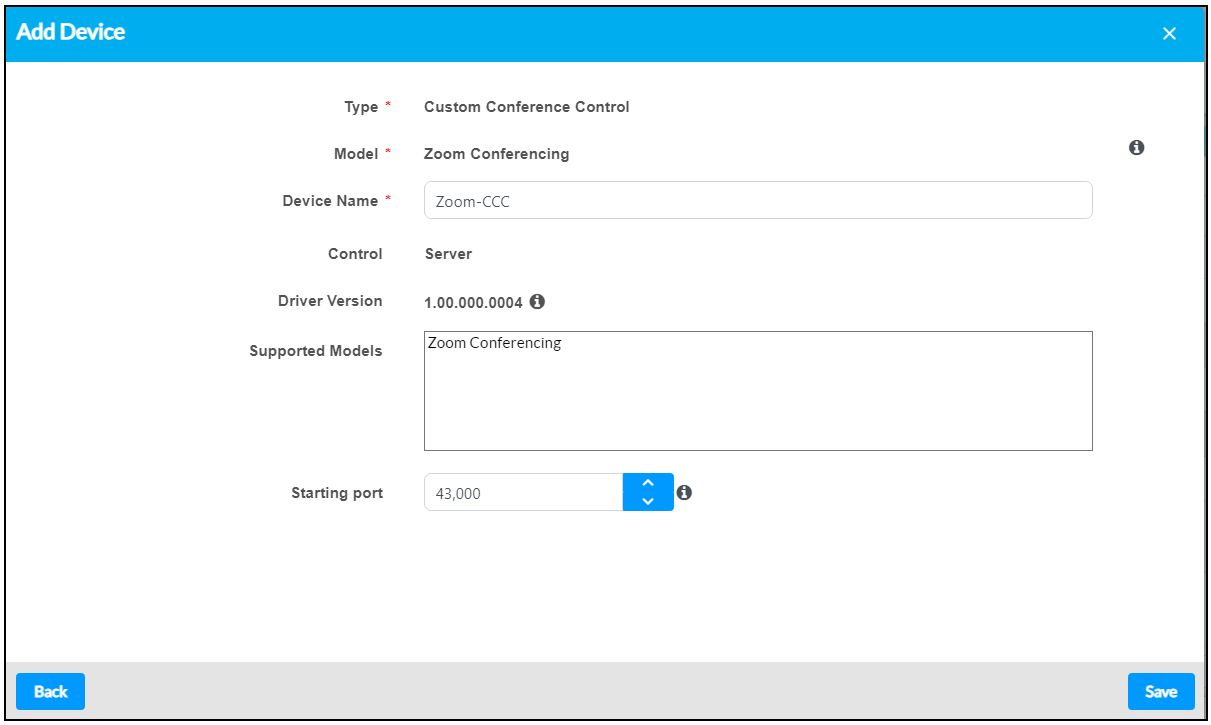
> **NOTE:** A Zoom® software account is required to use this functionality. Contact your IT administrator for assistance.

.AV Framework Configuration

1. Navigate to **Settings** > **Manage Devices** within the .AV Framework web configuration interface.
2. Select **Add Device**. The **Add Device** dialog box is displayed.
3. Navigate to and select the appropriate Zoom Rooms device driver in the provided table. For more information on adding devices, refer to Manage Devices on page 74.
4. Enter a descriptive name for the device in the **Device Name** text field.
5. Select **Next**. Additional information and settings for the device are displayed.

   > **NOTE:** The Zoom Rooms device driver is imported from the cloud and installed into the .AV Framework system automatically.

Add Device Dialog Box - Custom Conference Control



6. If required, enter a custom starting port into the **Starting port** text field. This port is used to set the port range for the Zoom Rooms controller.

   NOTES:

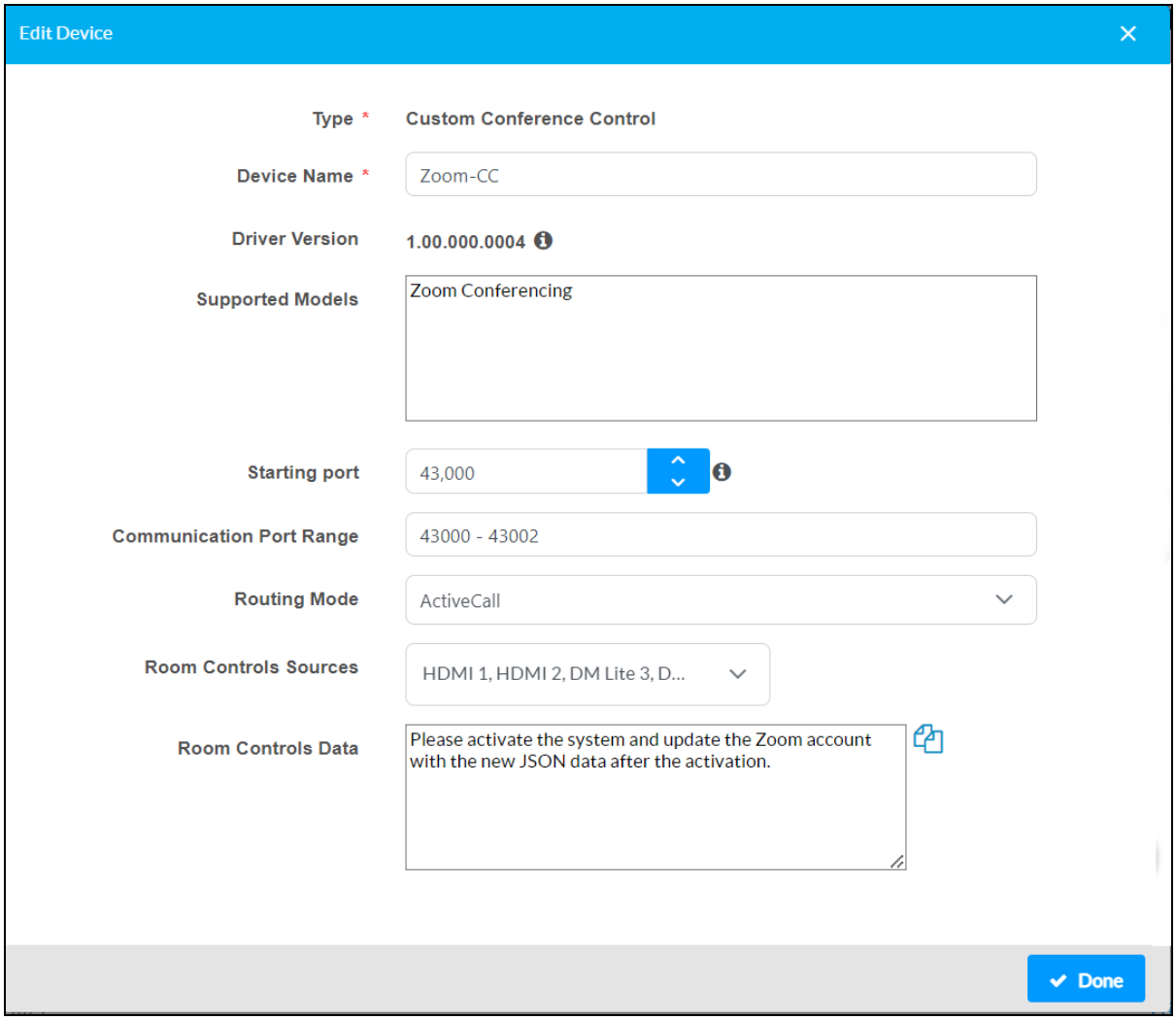
   - Any port ranges assigned in .AV Framework must be opened on the Crestron Virtual Control server. For more information, refer to the Crestron Virtual Control Installation Guide.
   - .AV Framework does not check whether the assigned port range overlaps with other port ranges in use. Therefore, if running multiple Zoom Rooms controllers across different Crestron Virtual Control rooms, Crestron recommends setting a buffer of at least 50 between starting port values across rooms (for example, 43000, 43050, 43100, and so forth).

7. Select **Save**. The Zoom Rooms controller is added to the device list for the .AV Framework system.

   NOTE: The .AV Framework system must be activated after adding the Zoom Rooms controller. The Zoom Rooms controller should also be added after adding and configuring all other input devices in the system, as the configuration options for the controller reflect the current input configuration for the system. For more information on configuring inputs, refer to Configuration on page 39.

8. Select the edit button next to the Zoom Rooms controller in the **Manage Devices** accordion. The **Edit Device** dialog box is displayed for the Zoom Rooms controller.

Edit Devices Dialog Box - Zoom Rooms Controller



9. Use the **Routing Mode** drop-down menu to select the routing behavior for the Zoom Rooms controller when an active Zoom call is detected.
    - **Manual**: The Zoom output source must be routed to any displays manually.
    - **ActiveCall**: The Zoom output source will be routed to all displays automatically.

    > **NOTE:** Observe the following points for active call routing:
    >
    > - No routing changes occur after the Zoom call is disconnected. Any routing that was in use prior to the Zoom call must be manually reset.
    > - If a switcher output (other than the **Zoom Capture** output) has a fixed route to a display, the Zoom call will not be routed to that output.
    > - If a switcher output (other than the **Zoom Capture** output) has a follows route to a display, the Zoom call will also be routed to that output.

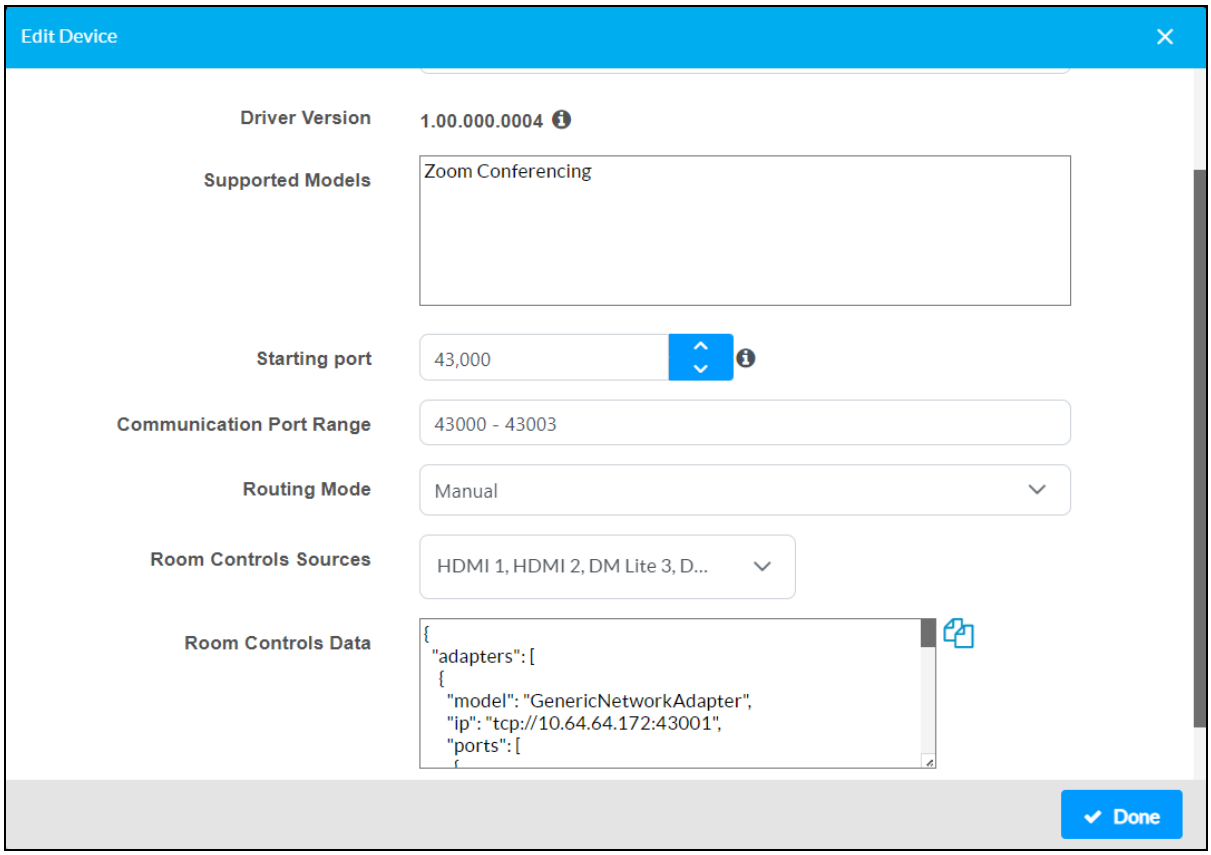
10. Use the **Room Controls Sources** drop-down menu to fill the check boxes next to the input devices that should have control buttons in the Zoom Rooms controller application. Any unchecked input device will not be shown.

    > **NOTE:** Switching between **Manual** and **ActiveCall** routing modes does not require a restart to the .AV Framework configuration. However, a restart is required if changes are made to the input devices in the **Edit Device** dialog box or to the input devices in the **AV Routing** settings accordion.

11. Select **Done**, then activate the .AV Framework system.
12. Reopen the **Edit Device** dialog box for the Zoom Rooms controller.
13. Select the copy button next to the **Room Controls Data** text field to copy the generated JSON output to the clipboard. This output will be required for configuration within the Zoom Rooms controller application.

    > **NOTE:** Any time that the input device list changes, a new JSON output must be generated and loaded into the Zoom Rooms controller application.

Edit Devices Dialog Box - Zoom Rooms Controller (Room Controls Data)



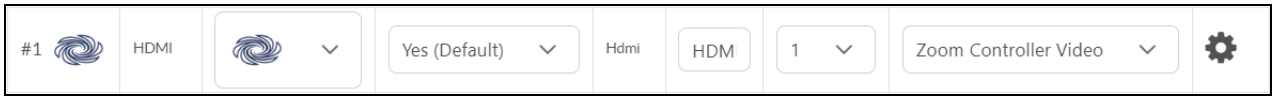
Configuration for a UC-ENGINE Device

If you are using a Crestron UC-ENGINE device and the output is connected to your .AV Framework switcher device, the following additional configuration is recommended:

> **NOTE:** The Zoom Rooms controller device must first be added to the .AV Framework system as described in .AV Framework Configuration on page 155. Adding the Zoom Rooms controller will expose a **Video** device type for the switcher input and a **Capture** device type for the switcher output. The user-defined name created for the Zoom Rooms controller device is added to the beginning of these selection names.

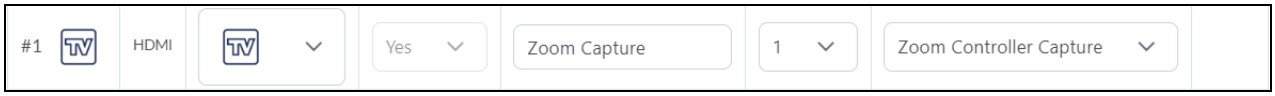
1. Navigate to **Settings** > **AV Routing** within the .AV Framework web configuration interface.
2. Select the **[Zoom Controller] Video** device type on the switcher input that is connected to the UC-ENGINE.

   AV Routing Accordion - Video Switcher Input



3. Select the **[Zoom Controller] Capture** device type on the switcher output that is connected to the UC-ENGINE input.

   AV Routing Accordion - Capture Switcher Output



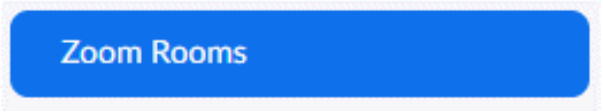
   > **NOTE:** The **[Zoom Controller] Capture** output cannot be set to use fixed or follows routing. If **Zoom Capture** is selected for an output that previously was set to use fixed or follows routing, the routing setting will be cleared.

4. Activate the .AV Framework system.

Zoom Rooms Configuration

1. Log into your Zoom Rooms account at https://zoom.us/signin.
2. Select the **Zoom Rooms** menu button.

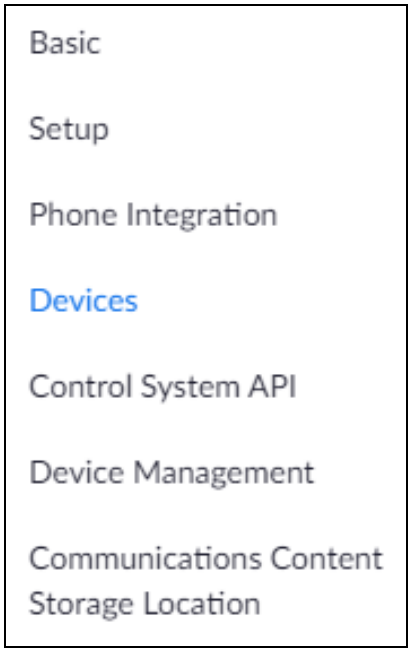
   Zoom Rooms Menu Button



3. Select the room from the **Zoom Rooms** menu tree where the .AV Framework configuration should be applied.
4. Select the **Edit** button.

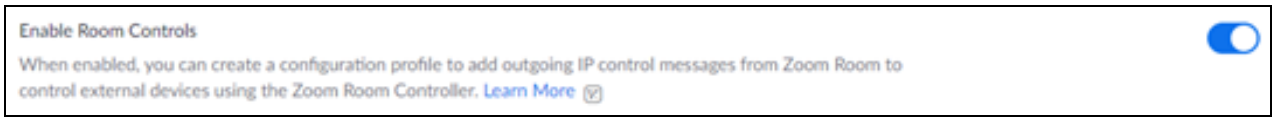
5. Select **Devices** from the editing menu.

Editing Menu - Devices Selection



6. Turn on the **Enable Room Controls** toggle near the bottom of the **Devices** page.

Devices Page - Enable Room Controls Toggle



7. Select **Edit Profile** on the **Devices** page.

Edit Profile Button



8. Copy the JSON output that was created in step 8 of .AV Framework Configuration on page 155 and paste it into the JSON profile for the room.

> **NOTE:** Ensure that any data that was previously entered for the JSON profile is deleted prior to adding the new profile from .AV Framework.

9. Select **Save**. It may take up to 2 minutes for the new controls to show on the Zoom Rooms controller application.

Appendix E: Configuring Modern Authentication for EWS

This appendix provides the procedures required to configure Modern Authentication (OAuth 2) support for .AV Framework software in the Microsoft® EWS (Exchange Web Services) service.

The Modern Authentication authorization model is provided by the Azure® Active Directory® service to integrate managed API applications with the same authentication model used by the Office 365® software REST APIs. Once Modern Authentication is configured in EWS, .AV Framework uses this access method to provide heightened user authentication.

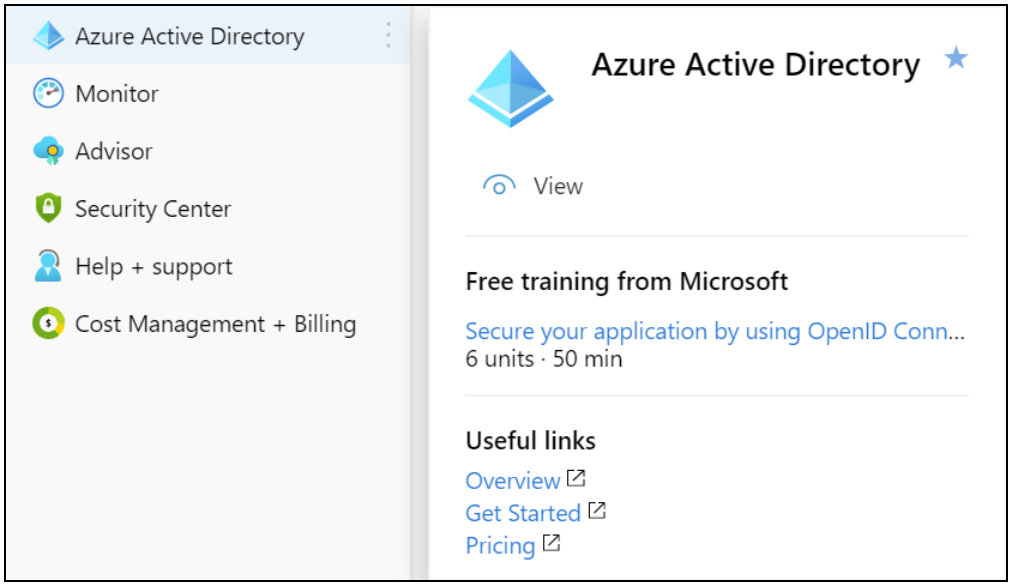
Configure the .AV Framework EWS App

Use the following procedures to define a new application in Azure Active Directory that will be used to configure Modern Authentication for use with .AV Framework.

Create the .AV Framework App

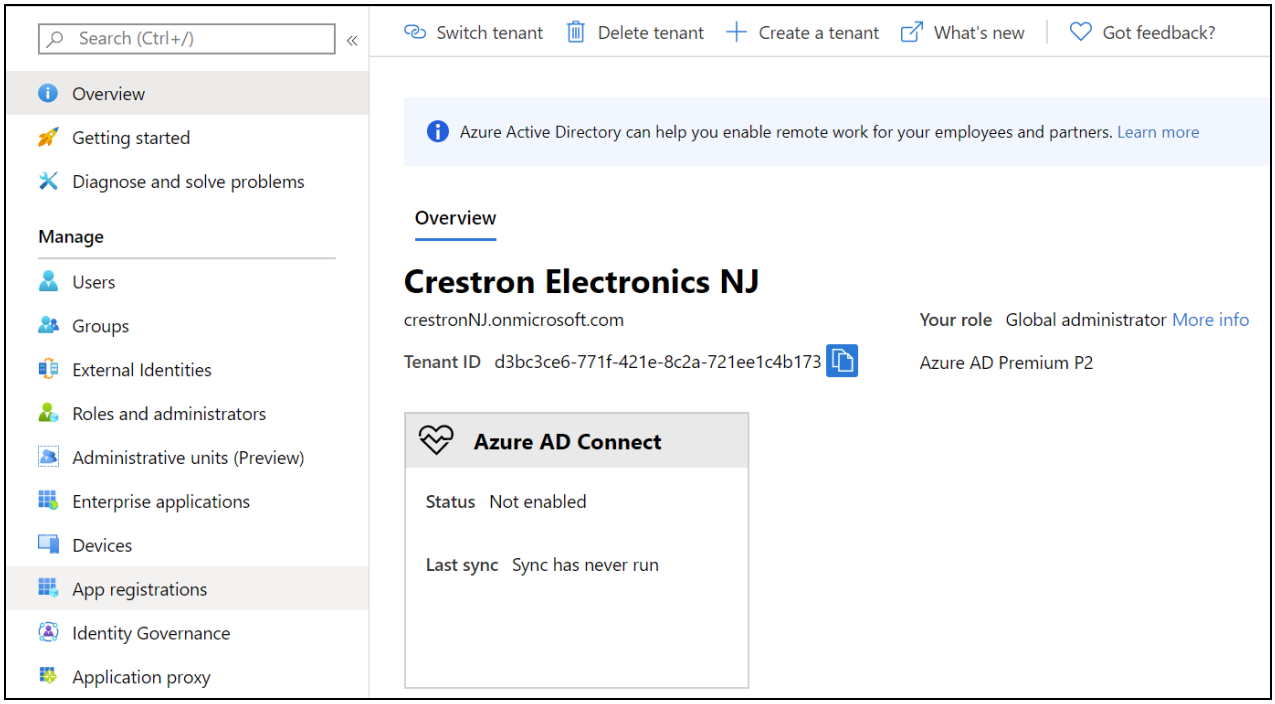
1. Sign into the Azure portal with a user ID with sufficient permissions to create an app.
2. Select **Azure Active Directory** from the left navigation menu. The **Azure Active Directory** page is displayed.

   Azure Active Directory Page



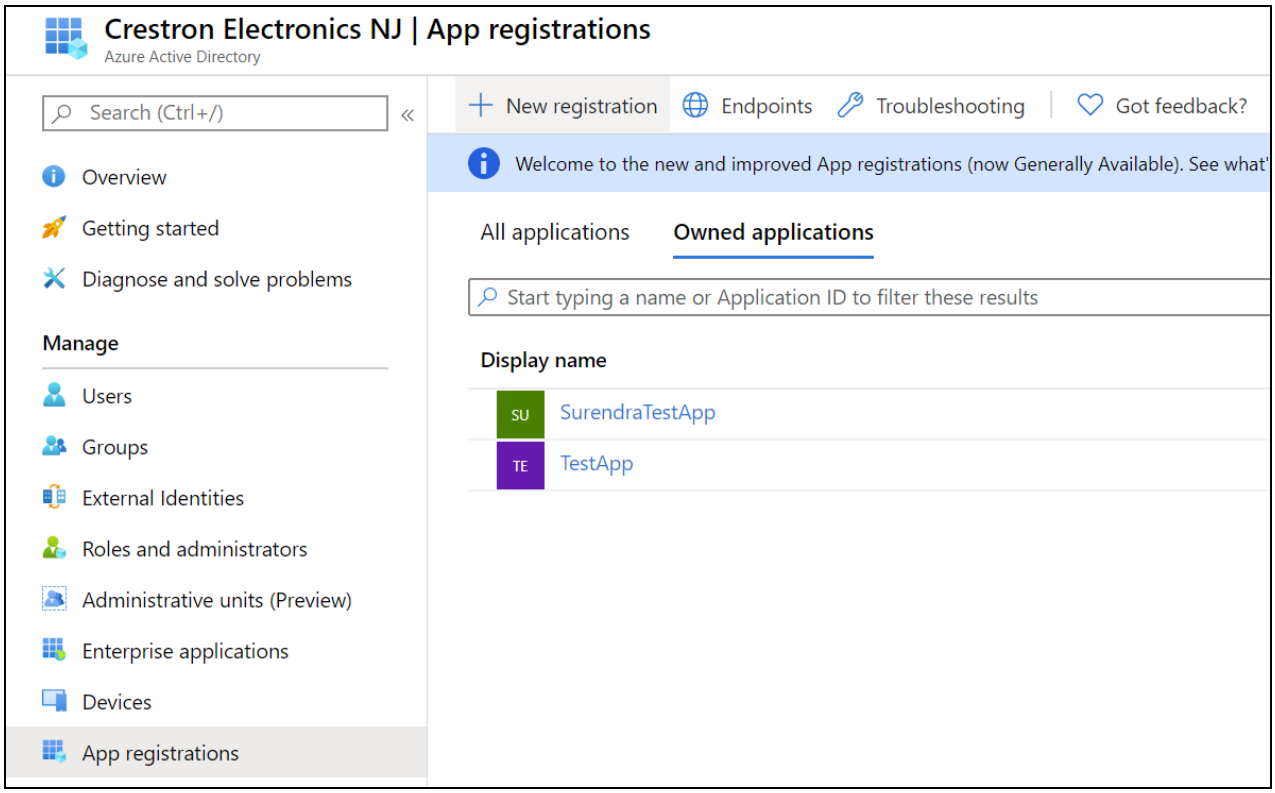
3. Select **App registrations** from the Azure widget menu. The **App registrations** page is displayed.

App registrations Selection



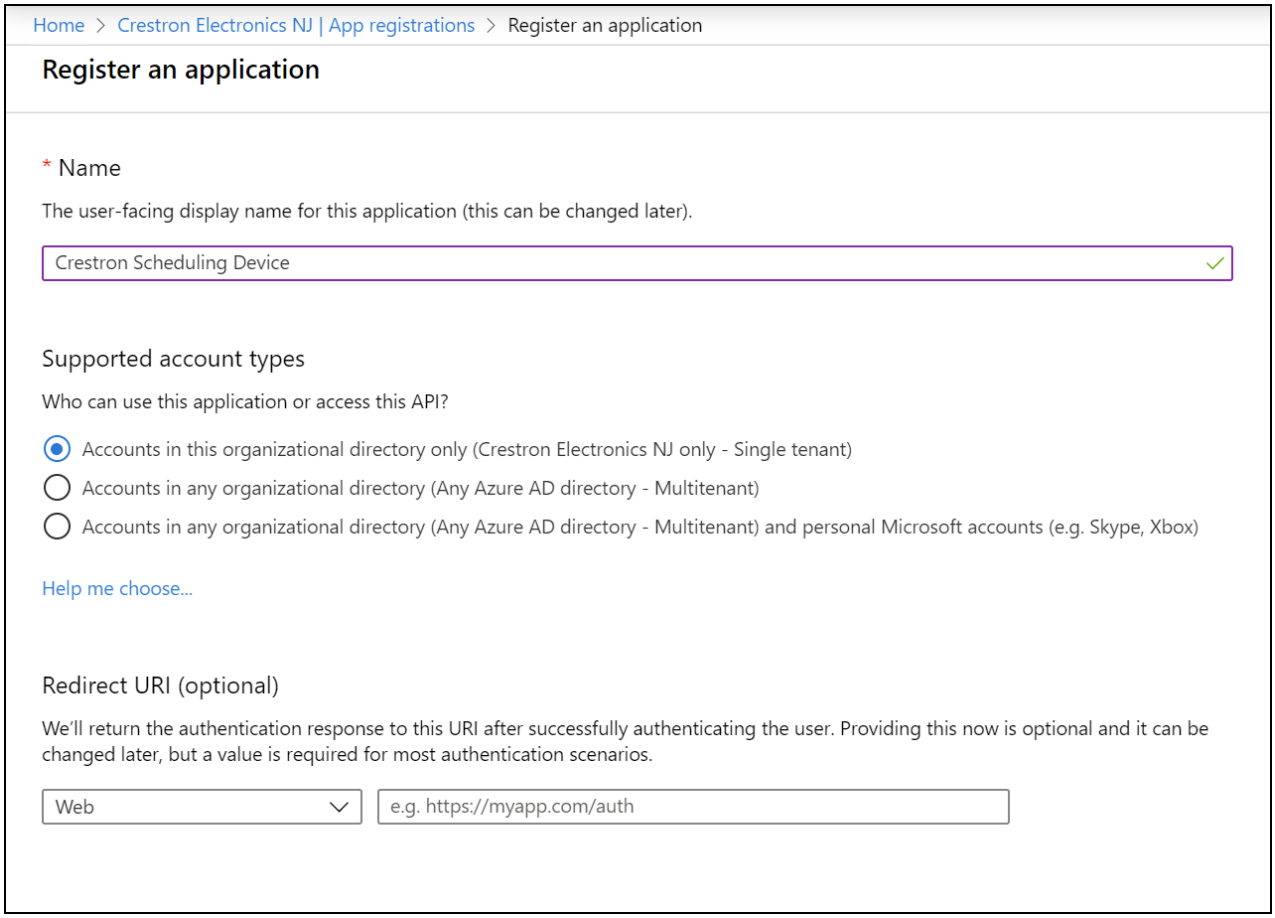
4. Select **+ New registration**.

App registrations - New registration Screen



A dialog box for creating the app is displayed.

Register an application Dialog Box



5. Enter the following information:
   - **Name:** Enter a user-facing name of the application (in the Azure environment). This can be any string 120 characters or less. It is possible to have more than one application registered with the same display name.
   - **Supported account types:** Select the supported account type. Only the **Accounts in this organizational directory only** option is supported by .AV Framework at this time.

   NOTE: The **Redirect URI (optional)** settings are not configured for this application.

6. Select **Register** to register the application with Azure Active Directory.

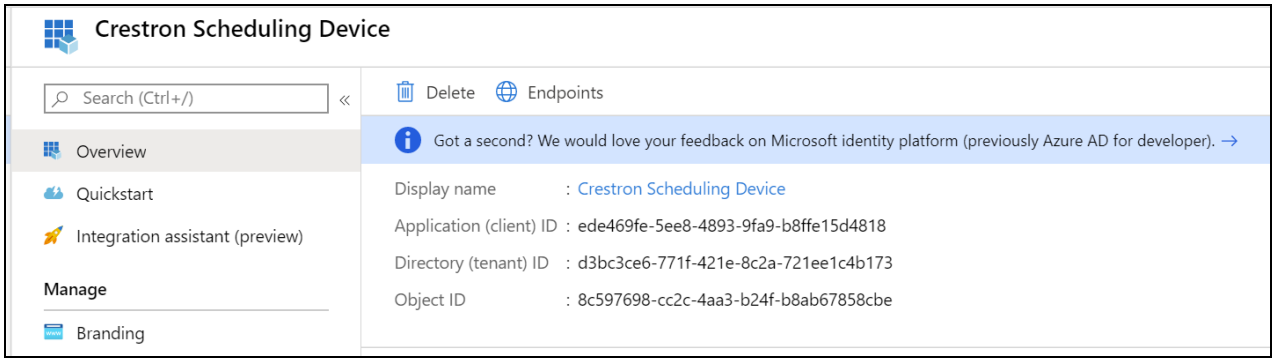
Obtain Authentication IDs

Once the application is registered, the application and directory IDs must be obtained to connect .AV Framework to the Azure AD app.

1. Select **App registrations** from the Azure widget menu.
2. Select the application created for the .AV Framework app. An application dialog box is displayed.

3. Select **Overview** from the navigation menu. Information about the Azure app is provided.

Application Overview Screen



4. Copy the following fields from the **Overview** pane to an accessible location. Use the **Copy to Clipboard** button that appears when hovering over each field to ensure accuracy.
   - **Application (client) ID**: The unique identification string for the Azure app.
   - **Directory (tenant) ID**: The unique identification string for the Azure directory.

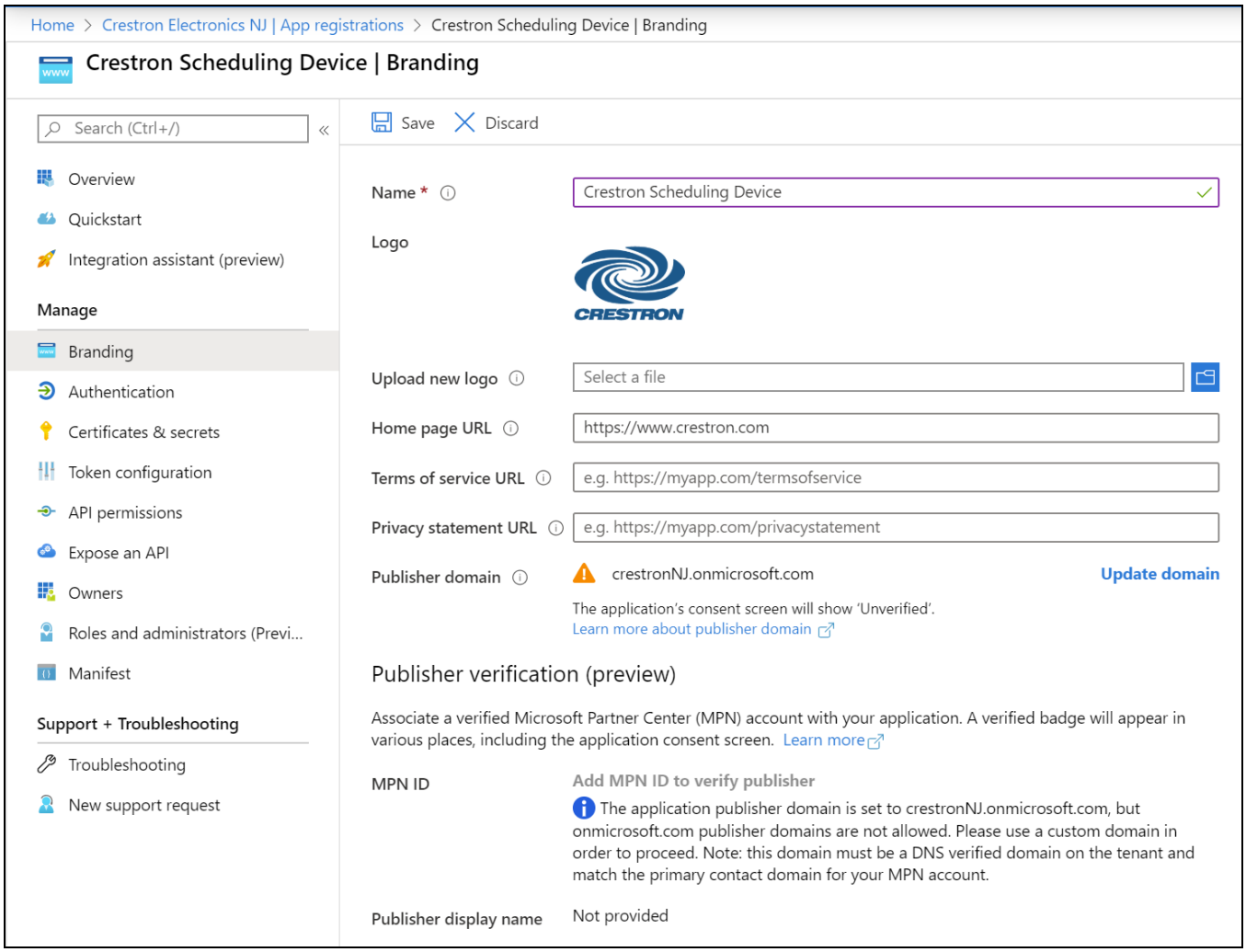
Configure Additional Settings

The following additional settings can be configured for the Azure app. These settings define the user consent experience, authentication details, and API access scopes available to the application.

Branding

Select **Branding** under the **Manage** section of the application navigation menu to configure branding settings for the app.

Application Branding Screen



The following branding settings can be configured for .AV Framework:

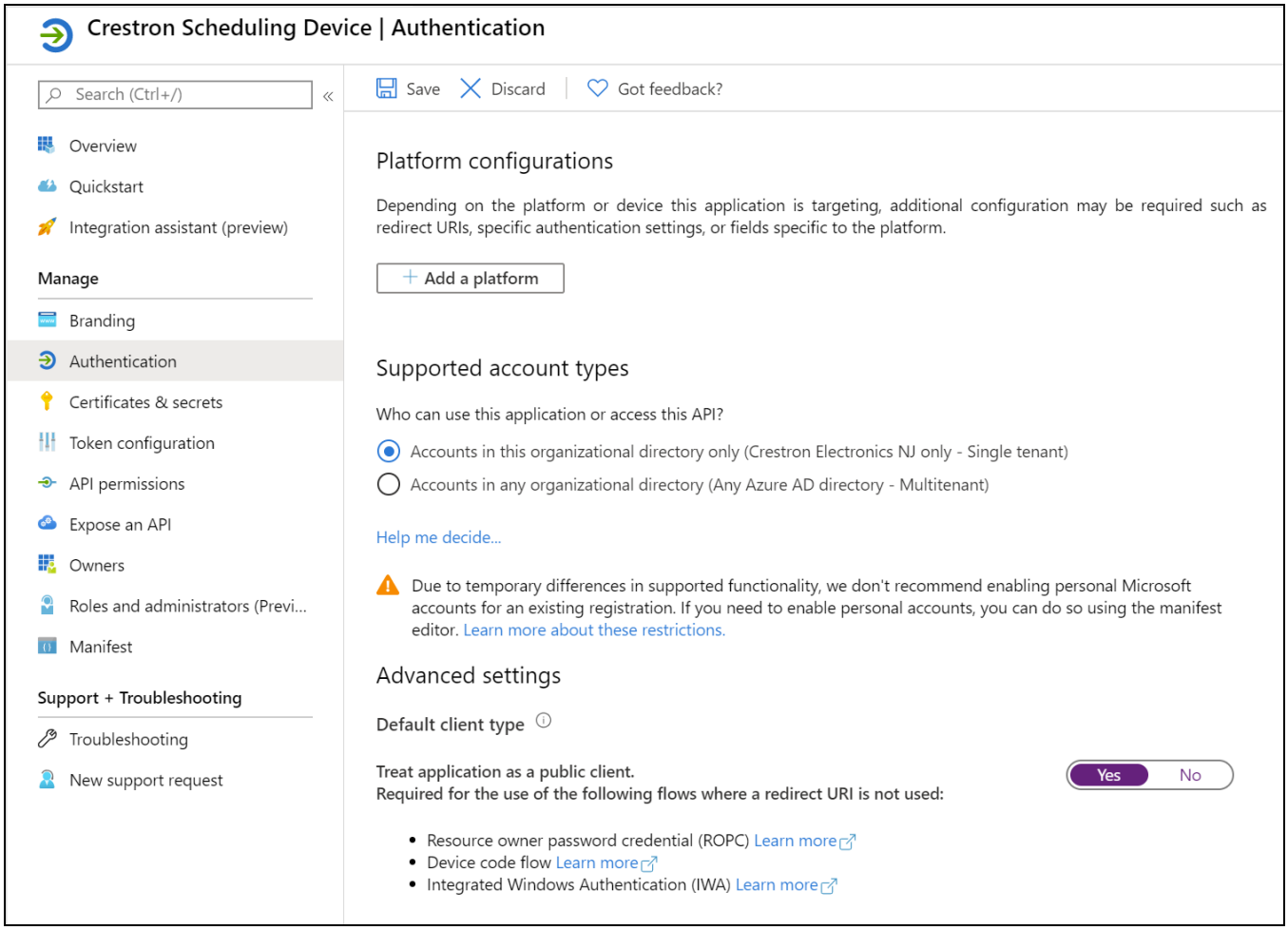
- **Name**: **Required.** Set the user-friendly name of the application. This is the same name that was defined when registering the application, but it can be changed here.
- **Upload New Logo**: Set a user-facing logo for this application that appears on the consent screen. The image file for the logo must meet the following requirements:
  - Image dimensions of 215 x 215 pixels
  - Central image dimensions of 94 x 94 pixels
  - Uses the file type .bmp, .jpg, or .png
  - File size less than 100 KB
- **Privacy statement URL**: Provides a link to the application privacy statement in the consent screen.

- **Publisher domain**: Sets the process that must be completed to verify ownership of the domain. Most users will probably already have a verified domain. If the domain is not verified, the application will work, but the consent screen will warn the user they are consenting to an unverified application.

Authentication

Select **Authentication** under the **Manage** section of the application navigation menu to configure authentication settings for the app.

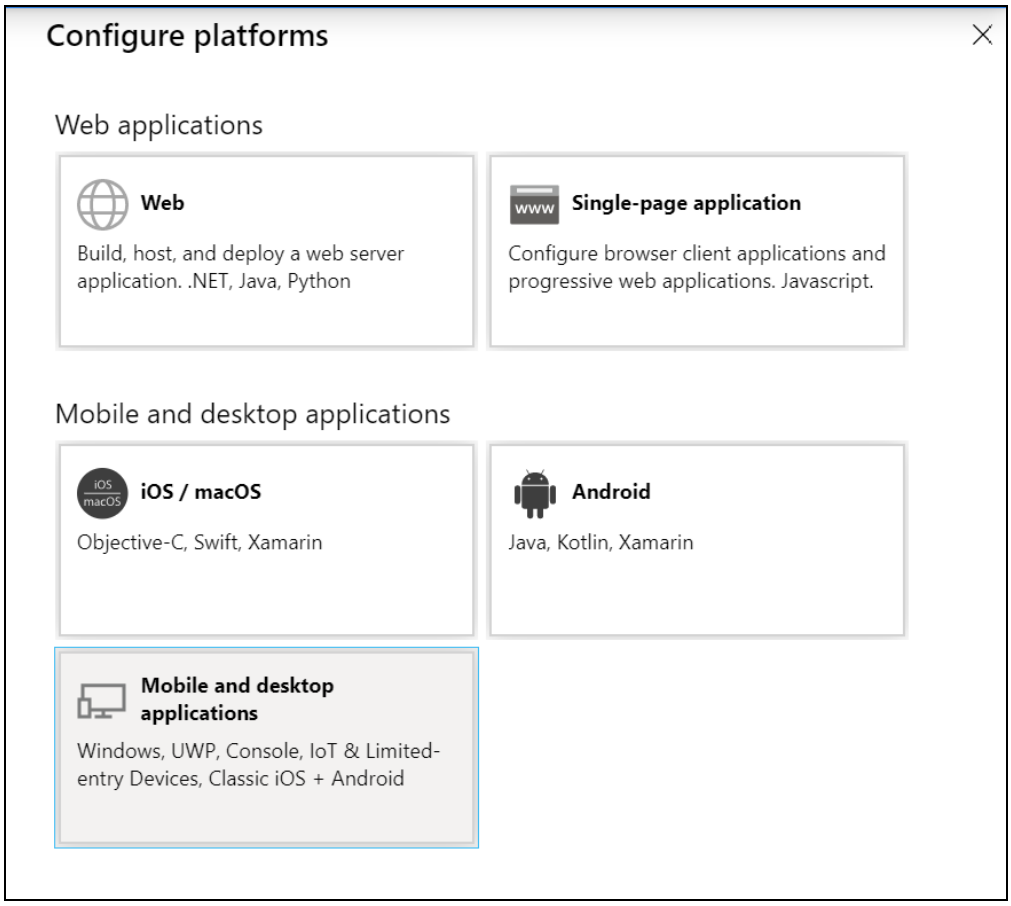
Application Authentication Screen



The following authentication settings can be configured for .AV Framework:

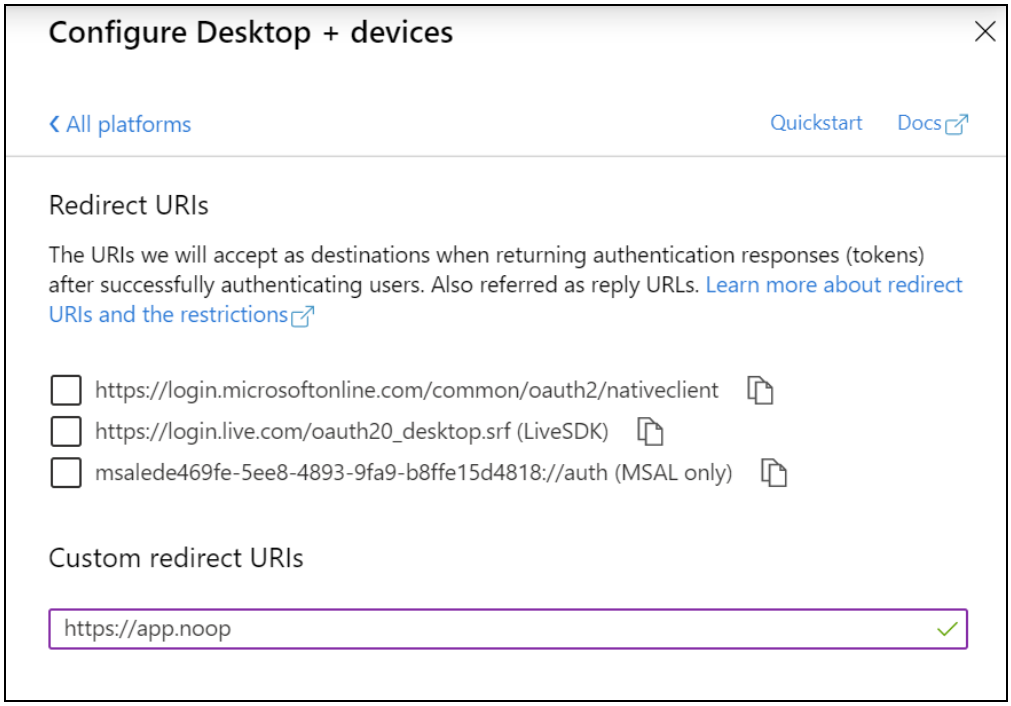
- **Add a Platform**: Select this button to create a platform for app authentication. The **Configure platforms** pane is displayed on the right side of the screen.

  Configure platforms Pane



Select **Mobile and desktop applications** to display settings for configuring this platform.

Configure Desktop + devices Pane



Azure AD requires the use of a redirect URI, but .AV Framework does not. Enter a valid URI address and select **Configure**.

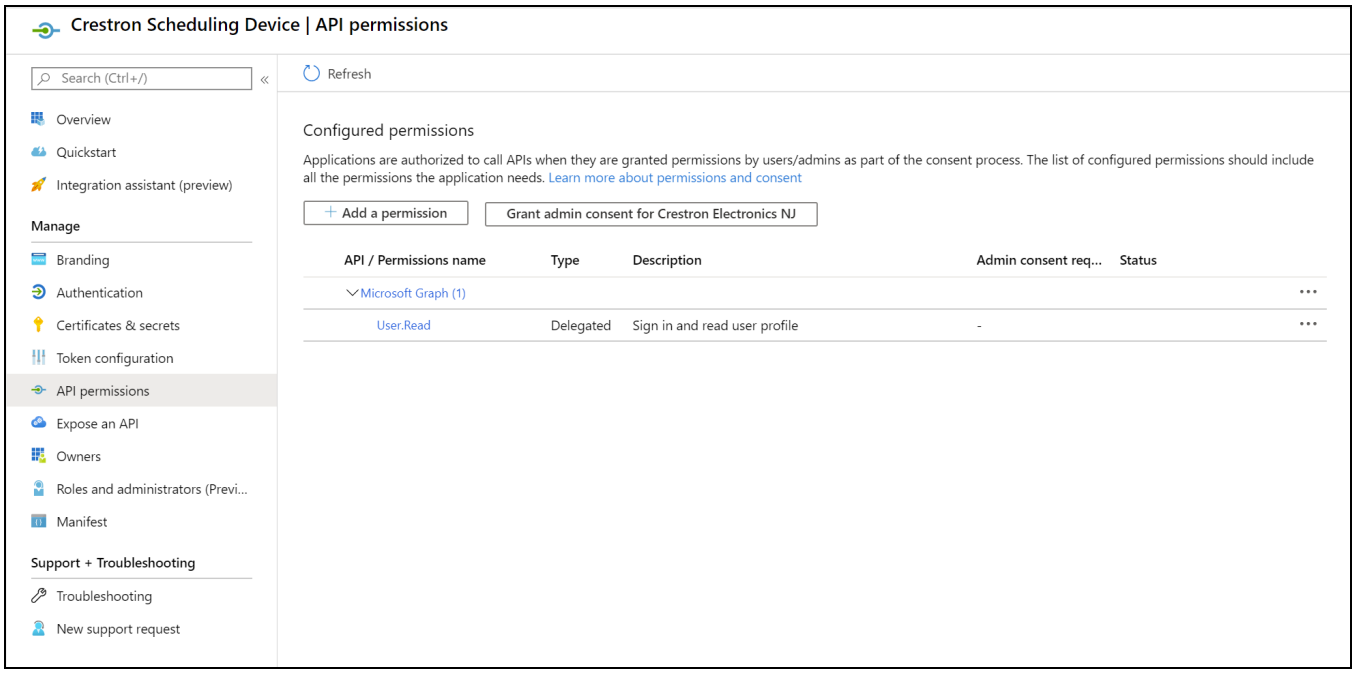
> **NOTE:** Certain sites require selecting the third check box **(MSAL only)** within this pane in order for authentication to work properly.

- **Supported account types**: Select an account type for the app. This setting is the same as the one set when registering the app and should not change from **Accounts in this organizational directory only**.
- **Default Client Type**: The **Treat application as a public client** toggle must be turned on.

API Permissions

Select **API Permissions** under the **Manage** section of the application navigation menu to configure API permissions for the app.

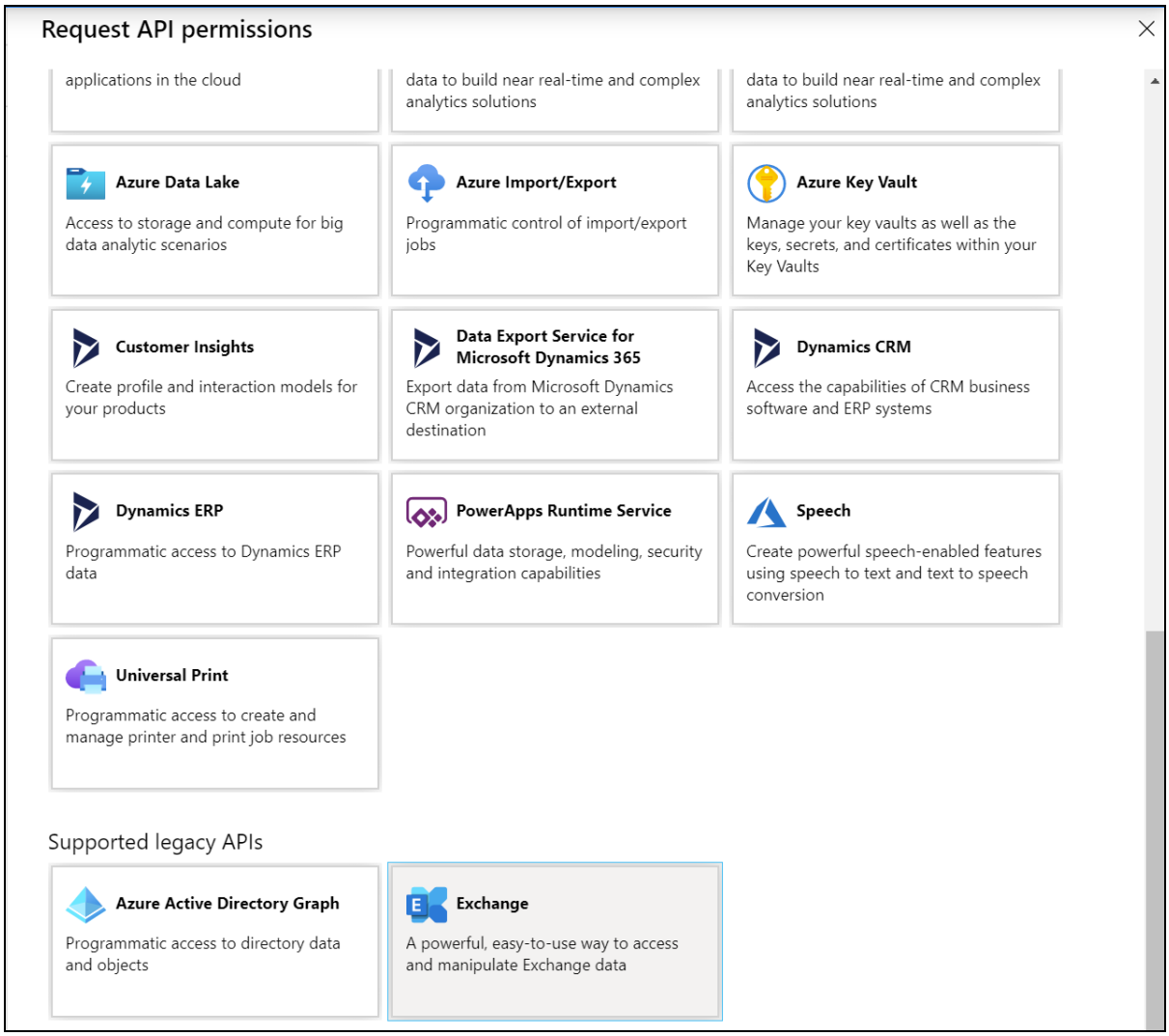
API Permissions Screen



The following API permissions settings can be configured for .AV Framework:

Select **Add a Permission** to create a new API permission for the app. The **Request API permissions** pane is displayed on the right side of the screen.

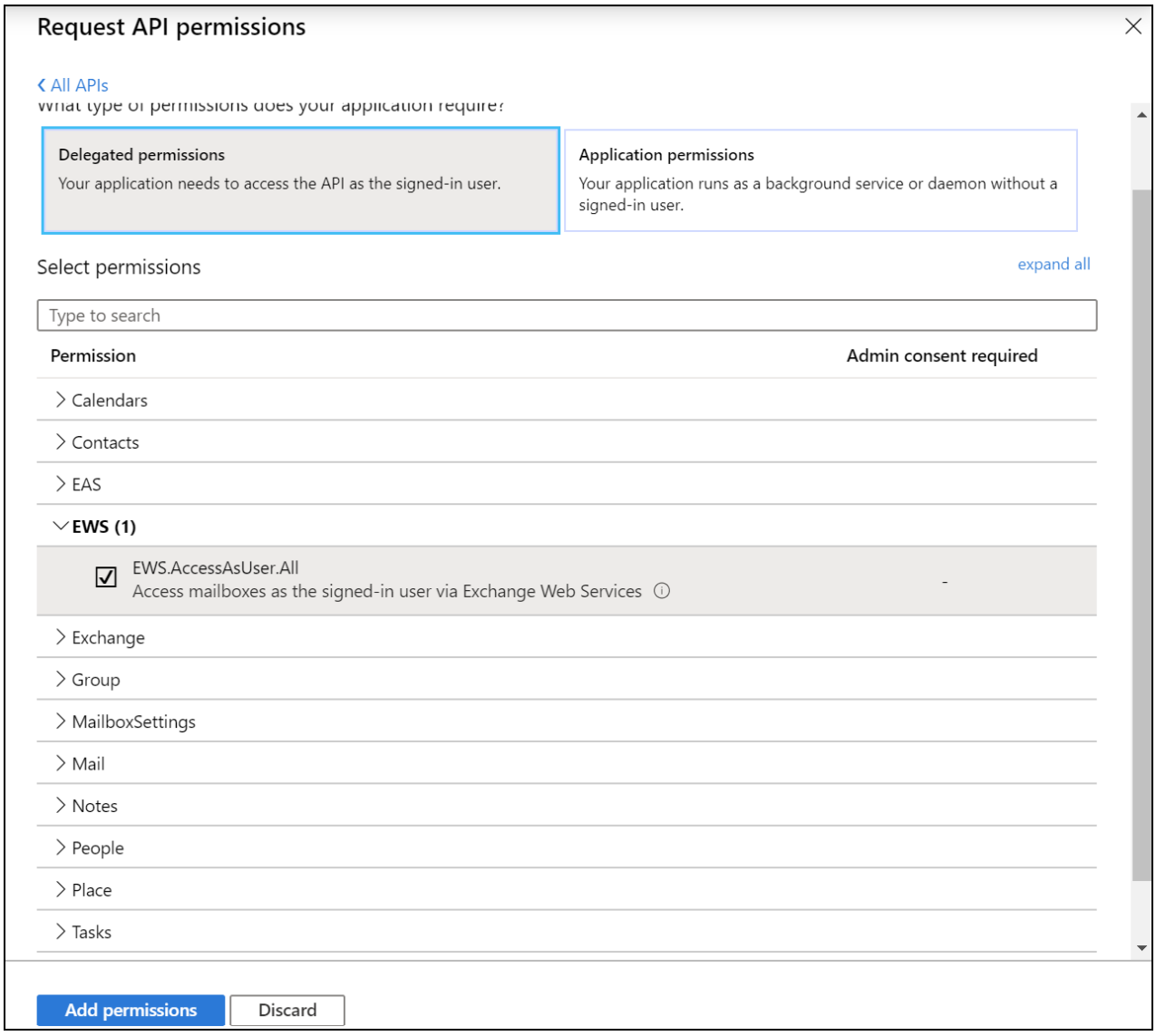
Request API permissions Pane



To set the API permissions for EWS:

1. Select **Exchange** to display a list of permissions for EWS.

   Request API permissions Pane - Exchange

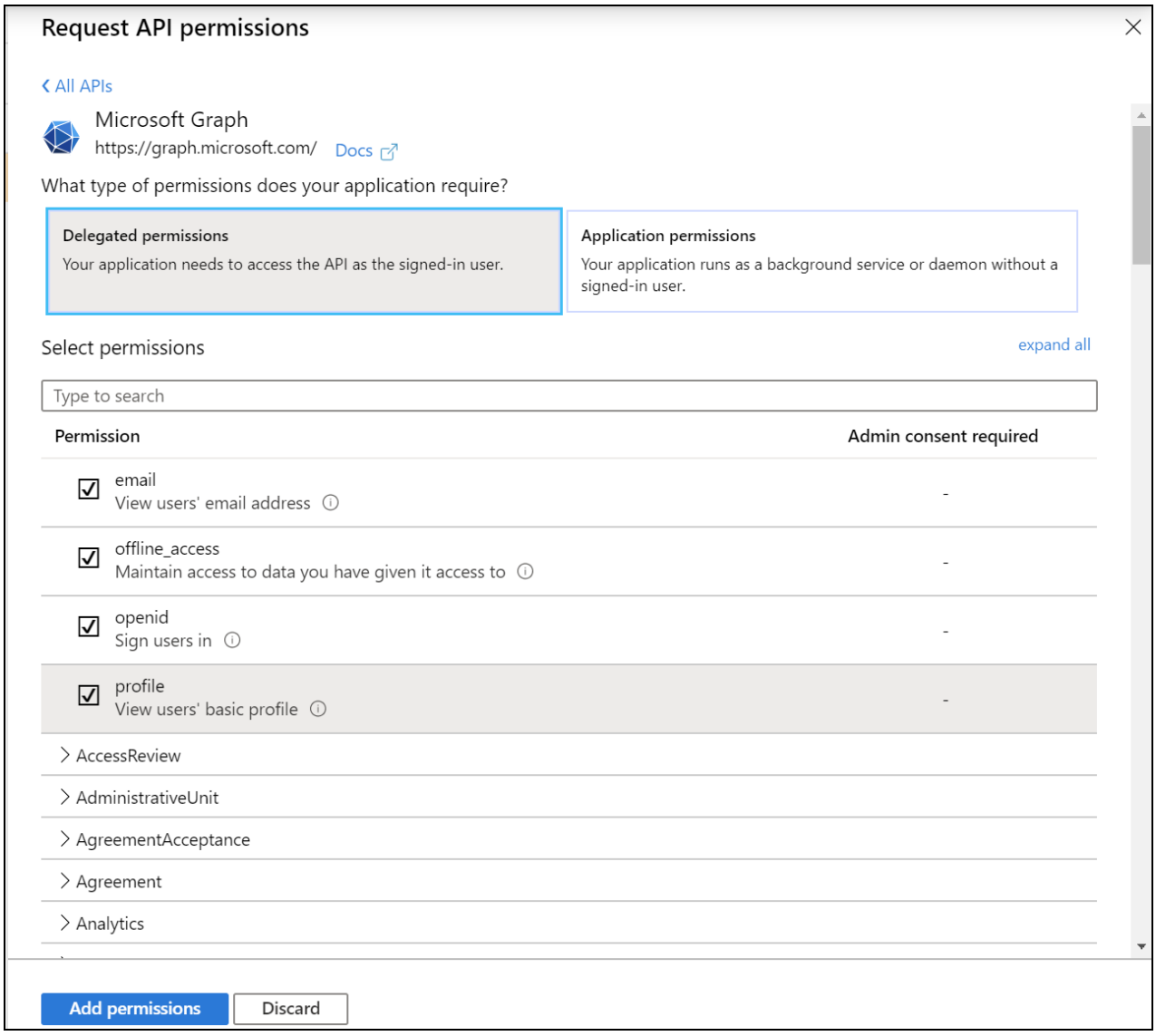


2. Expand the EWS accordion.
3. Fill the checkbox next to **EWS.AccessAsUser.All** to allow the application to make requests to the Exchange Web Services API on behalf of the configured user.

To set the API permissions for the Microsoft® Graph function:

1. Select **Microsoft Graph** to display a list of permissions for Microsoft Graph.

   Request API permissions Pane - Microsoft Graph

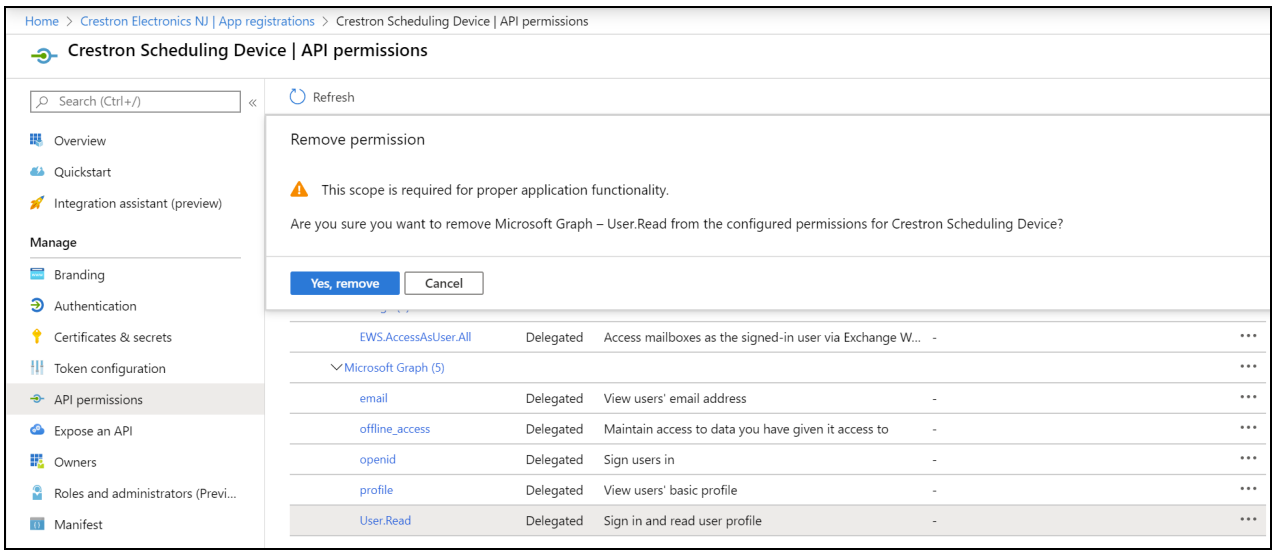


2. Fill the checkboxes next to the following settings to turn on the functionality described below:
   - **offline_access**: Allows the application to receive a Refresh Token, which can be exchanged for a new Access Token, when it expires. This is required for long running applications, so user consent is not required each time an access token expires.
   - **openid**: Allows the application to receive an ID Token, which provides basic profile information about the authenticated user. This scope is required for the next two scopes, as they are delivered in the ID Token.
   - **email**: provides the email address of the authenticated user. The application uses this to get the calendar address if none is entered during device configuration.

- **profile**: Provides basic profile information about the authenticated user, such as the display name and photo URL.

If the Microsoft Graph **User.Read** scope is added automatically, it can be removed. If there is a warning, it can be ignored.

API Permissions Screen - User.Read Scope



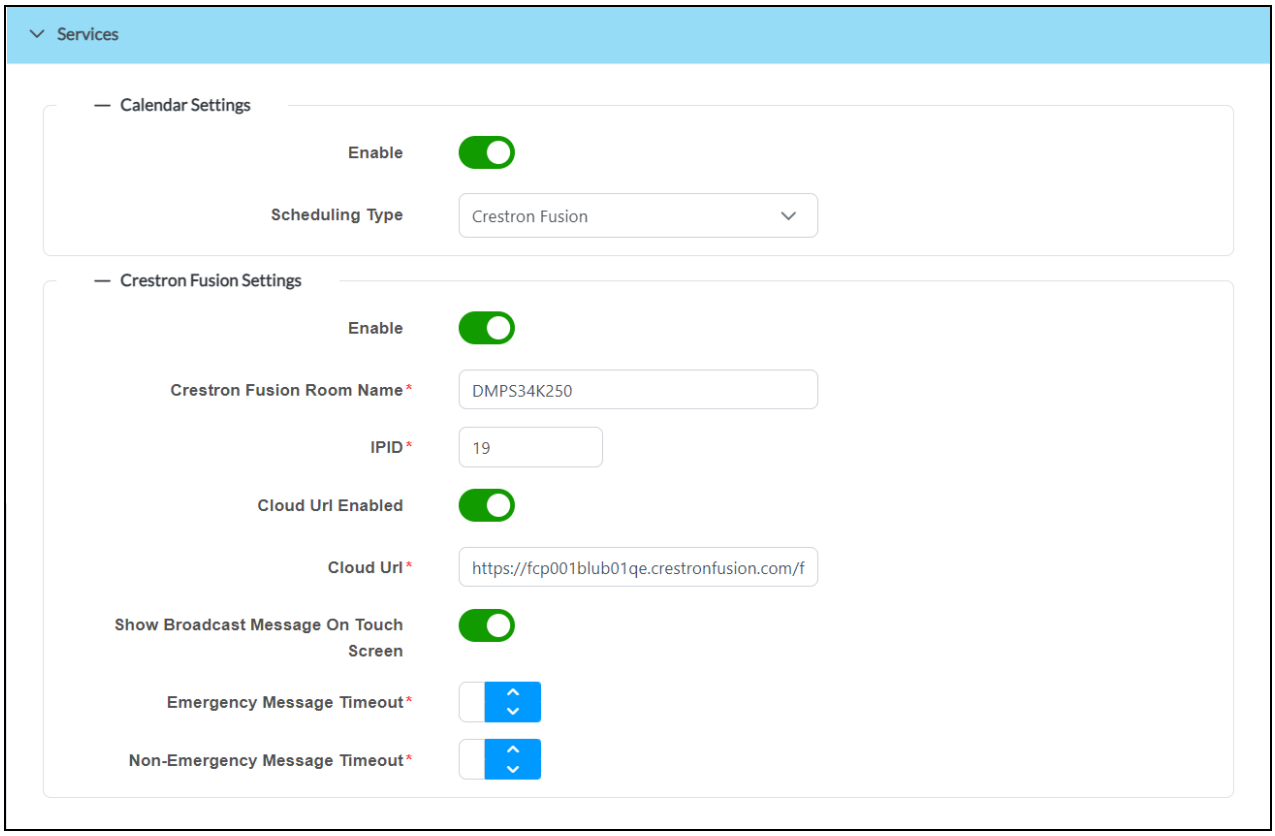
Connect the Scheduling App to EWS

Once an app has been registered in Azure AD, .AV Framework can be connected to EWS from the web configuration interface.

To connect .AV Framework to EWS:

1. In the .AV Framework web configuration interface, navigate to **Settings** > **Services**.

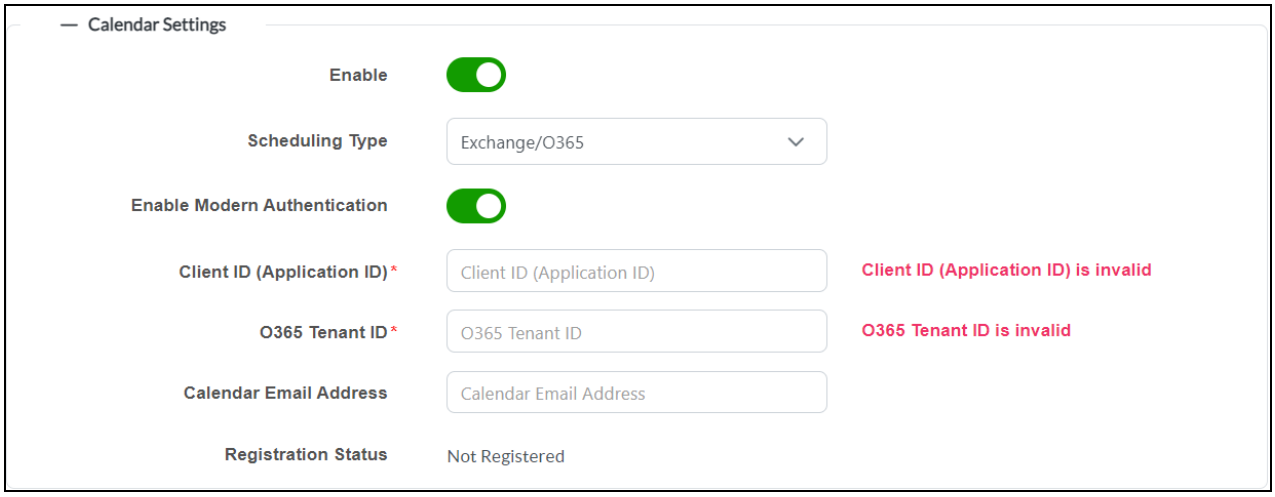
   Services Accordion



2. Select **Enable** in the **Calendar Settings** subsection to turn on a connection to EWS.
3. Select **Exchange/O365** from the **Scheduling Type** drop-down menu.

4. Turn on the **Enable Modern Authentication** toggle.

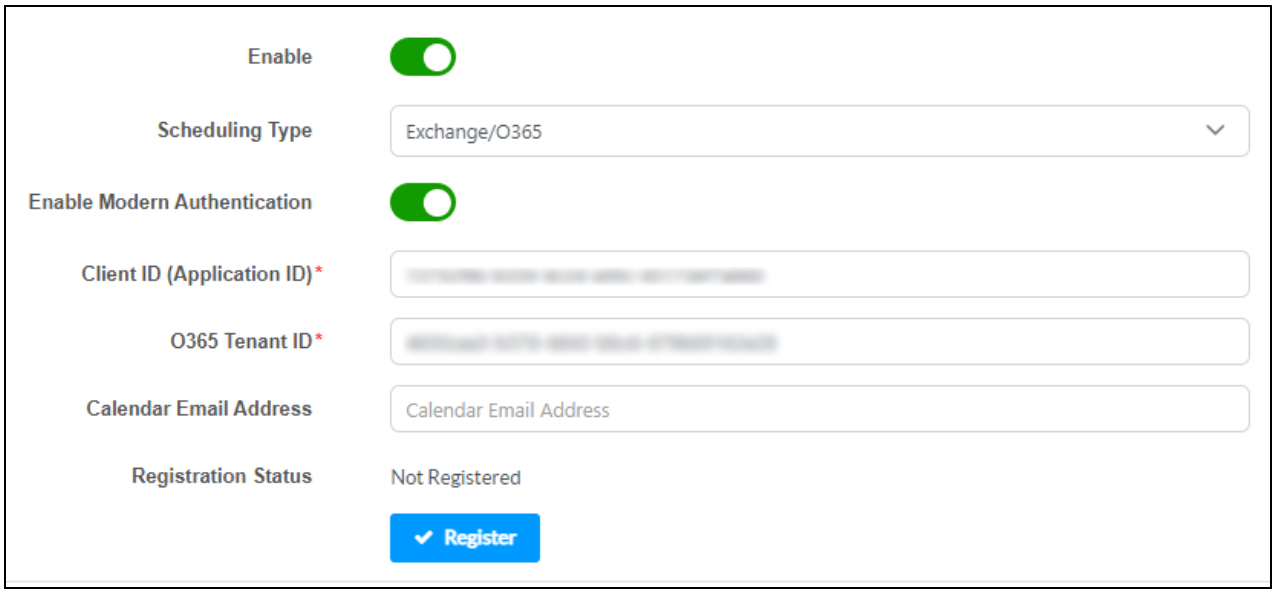
Calendar Settings (Exchange/O365) - With Modern Authentication



5. Enter the following information in the appropriate fields:
   - Copy and paste the application client ID obtained in Obtain Authentication IDs on page 164 into the **Client ID (Application ID)** text field.
   - Copy and paste the directory tenant ID obtained in Obtain Authentication IDs on page 164 into the **O365 Tenant ID** text field.
   - Enter the email address associated with the Microsoft Exchange scheduling calendar in the **Calendar Email Address** text field (optional).
6. Select **Save Changes** from **Actions** menu, then activate the new .AV Framework configuration.

   Once the new configuration is activated, a **Register** button is displayed within the **Calendar Settings** subsection for pairing the Office 365 account with .AV Framework.

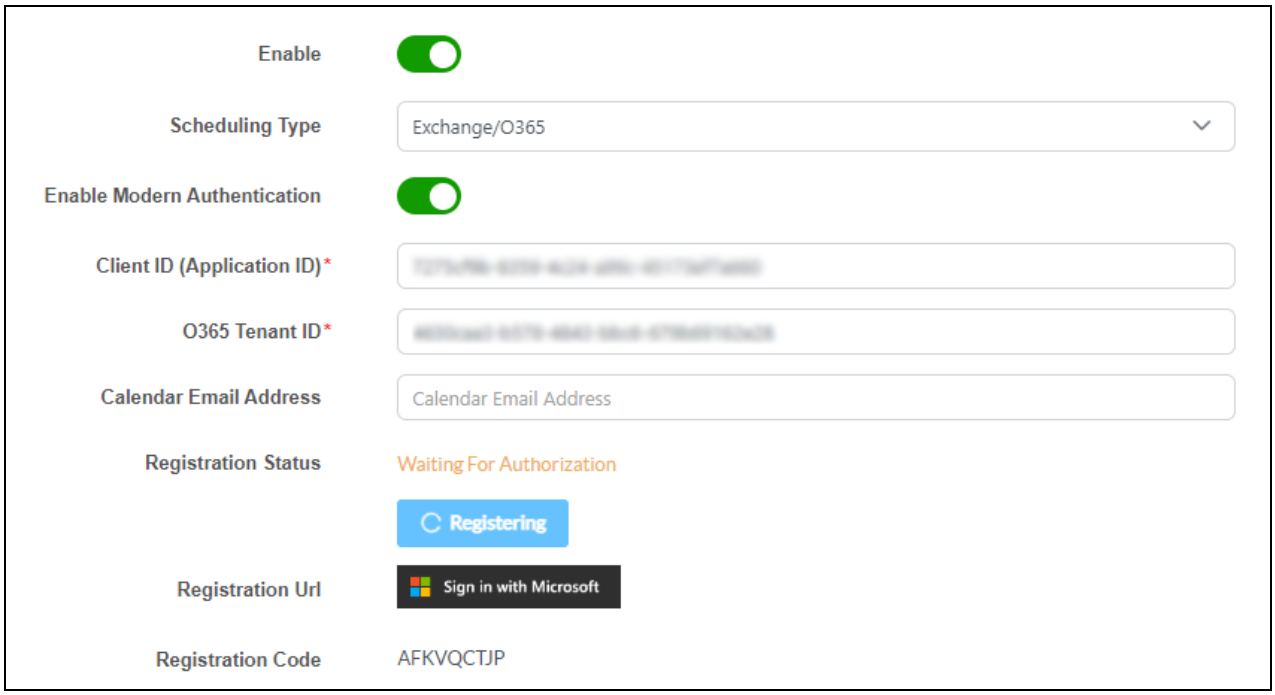
Calendar Settings Subsection - Register Button



7. Select **Register**.

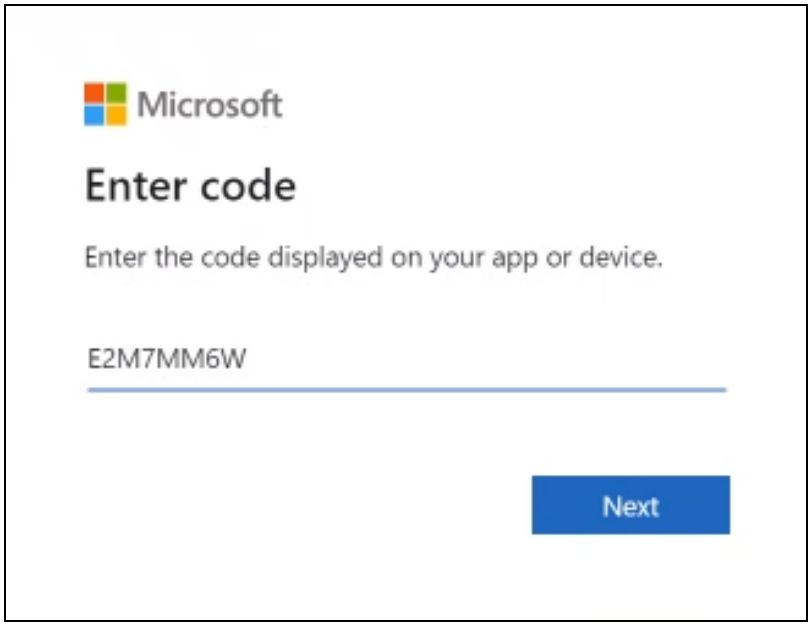
   When the web configuration interface refreshes, the **Calendar Settings** subsection displays a **Sign in with Microsoft** button, a registration code, and a registration status.

   Calendar Settings Subsection - Sign in with Microsoft Button



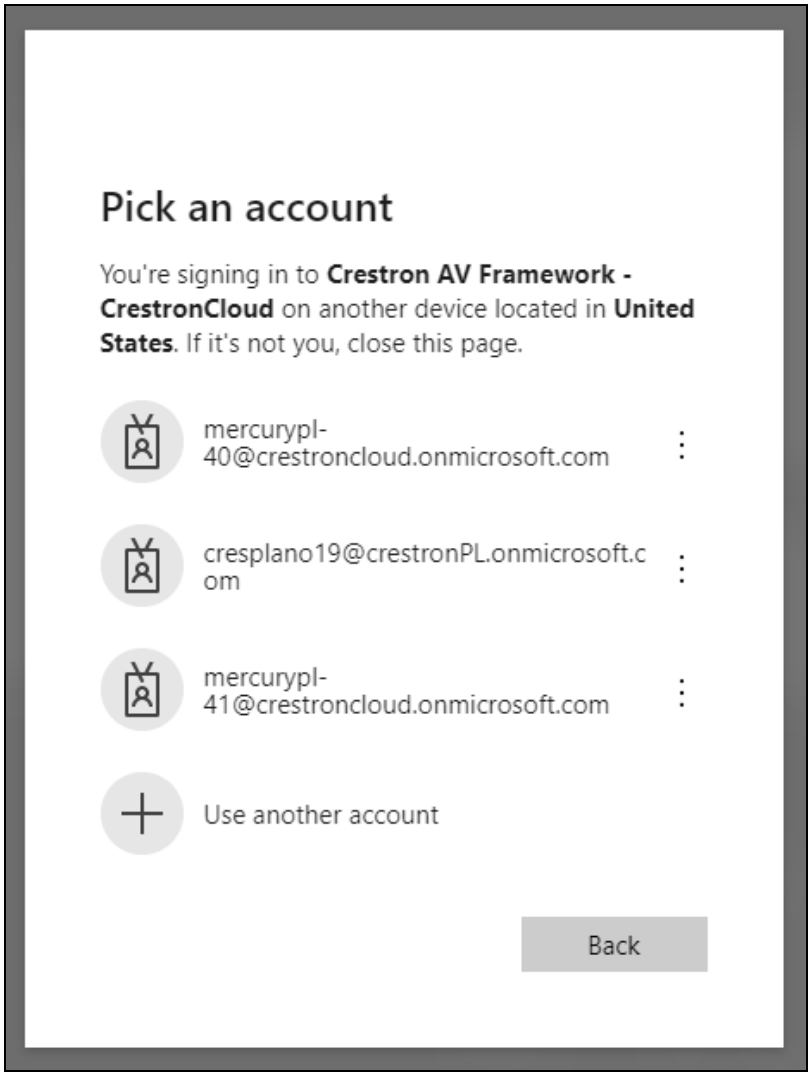
8. Select **Sign in with Microsoft**. An **Enter Code** dialog box is displayed.

   Enter Code Dialog Box



9. Enter the provided Exchange/O365 registration code in the text field and select **Next**. The **Pick an account** dialog box is displayed.

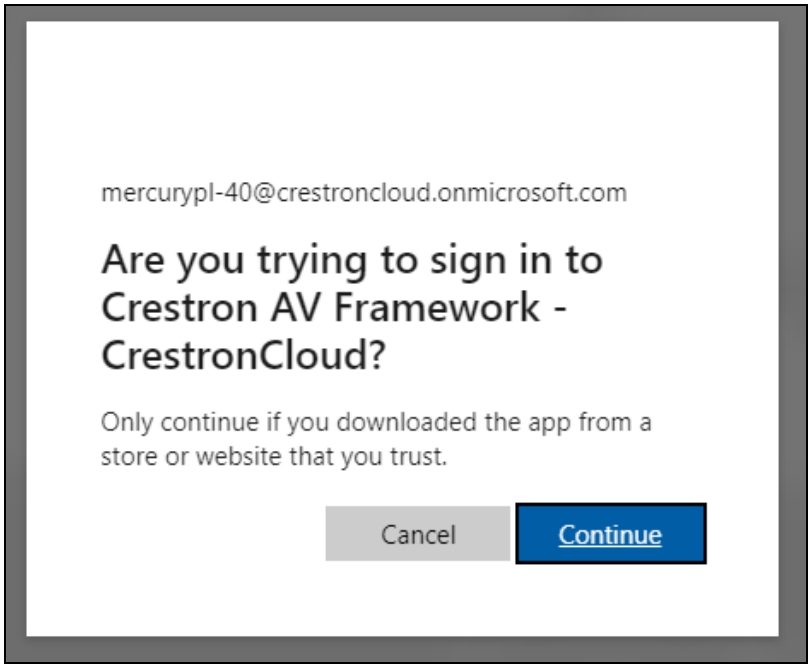
Pick an account Dialog Box



10. Select the EWS account that contains the desired scheduling calendar and enter the account password if prompted.

11. If the account has not yet been verified, a **Permissions requested** dialog box is displayed. Select **Accept** to verify the account. Otherwise, select **Continue** when prompted.

Permissions requested Dialog Box



When the web configuration interface refreshes, the registration status updates to **Registered**. The Exchange scheduling calendar connects to .AV Framework without requiring a restart.

Appendix F: Load Touch Screen Projects

As of software version 6.18, .AV Framework for Crestron Virtual Control supports three different methods for loading touch screen project (.vtz) files to a touch screen:

NOTES:

- TSW-770 and TSW-1070 touch screens must run firmware version 1.006.0046.001 or later to receive the touch screen project from Crestron Virtual Control.
- TSW-760 and TSW-1060 touch screens default to the auto update mechanism if no touch screen project has been loaded.
- If an invalid touch screen project is added to the .AV Framework program library, the touch screen reports an error when trying to load the program, and the touch screen project reverts to the previously-loaded project (if available). The auto update mechanism is not turned on automatically in this scenario.

- Add the touch screen project file manually to the .AV Framework program as described in Load the Program Files on page 11.
    - The touch screen project is loaded to the touch screen from the Crestron Virtual Control server directly once the touch screen comes online.
    - The **Enable Touch Screen Auto Update** function is hidden from the **Touch Screen Custom Graphics** configuration page when a touch screen project is added as part of the .AV Framework program library.
- Update and load the latest touch screen files automatically via the auto update mechanism.
    - If no touch screen project is added to the .AV Framework program library, the **Enable Touch Screen Auto Update** function is turned on by default and made visible in the **Touch Screen Custom Graphics** configuration page.
    - When **Enable Touch Screen Auto Update** is turned on, use the **.AV Framework User Interface Theme** drop-down menu select between **AVF 1.0 Theme - Smart Grahpics (Legacy)**, **AVF 2.0 Theme - Smart Graphics (Legacy)**, **AVF 2.0 Theme - Crestron HTML5 (Legacy)**, and **AVF 3.0 Theme - Crestron Construct (New)** user interface themes.
    - If a touch screen project file has not been previously loaded to the touch screen, the auto update mechanism downloads the latest .vtz file for the chosen **.AV Framework User Interface Theme** and loads it to the touch screen. The existing project file on the touch screen is overwritten.
    - If a touch screen project file has been previously loaded to the touch screen, the auto update mechanism updates the project file only if the hash file on the touch screen is different from the hash on the remote server or cloud.

- Load the touch screen project manually to the touch screen outside of .AV Framework.
    - If no touch screen project is added to the .AV Framework program library, the **Enable Touch Screen Auto Update** function is turned on by default and made visible in the **Touch Screen Custom Graphics** configuration page.
    - Turn off the **Enable Touch Screen Auto Update** function to load the touch screen project directly to the touch screen.

Appendix G: Configure Cisco Touch 10 Custom Conferencing

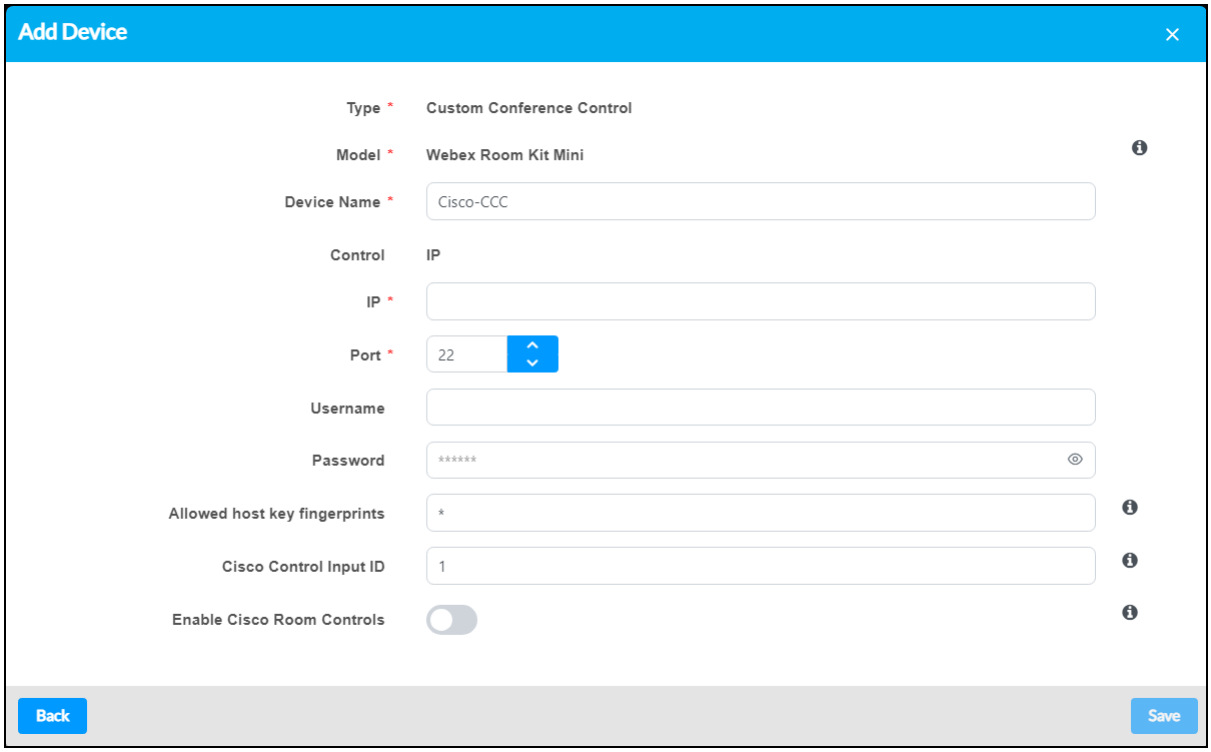
.AV Framework provides functionality that allows for custom control buttons to be added to a Cisco® Touch 10 controller application via a Cisco WebEx® Room Kit. These buttons are based on the inputs assigned within the .AV Framework system.

The following procedure describes how to add custom buttons to a Cisco Touch 10 controller application using .AV Framework.

1. Navigate to **Settings** > **Manage Devices** within the .AV Framework web configuration interface.
2. Select **Add Device**. The **Add Device** dialog box is displayed.
3. Navigate to and select the appropriate Cisco device driver in the provided table. For more information on adding devices, refer to Manage Devices on page 74.
4. Enter a descriptive name for the device in the **Device Name** text field.
5. Select **Next**. Additional information and settings for the device are displayed.

> **NOTE:** The Cisco device driver is imported from the cloud and installed into the .AV Framework system automatically.

Add Device Dialog Box - Custom Conference Control



6. Enter the following information for the Cisco WebEx Room Kit:.
    a. Enter all required communication information for the selected **Control** method (Serial or IP).
    b. Enter the username and password of a Cisco WebEx Room Kit user that has been given administrative privileges in the **Username** and **Password** text fields, respectively. For more information on creating Cisco WebEx Room Kit users, refer to Cisco's documentation.
    c. Enter a comma-delimited list of host key fingerprints for the connection between .AV Framework and Cisco WebEx Room Kit in the **Allowed host key fingerprints** text field. Enter an asterisk (*) to accept all host key fingerprints (the default settings).

        > **NOTE:** The fingerprint attribute is provided the Cisco driver DAT file, and .AV Framework passes it to the driver upon system startup. For SSH login, the fingerprint is a unique key identifier used for authentication. Refer to the following example:"SHA256:8A:9B:10:11:12:13:14:15:16:17:18:19:20:21:22:23".

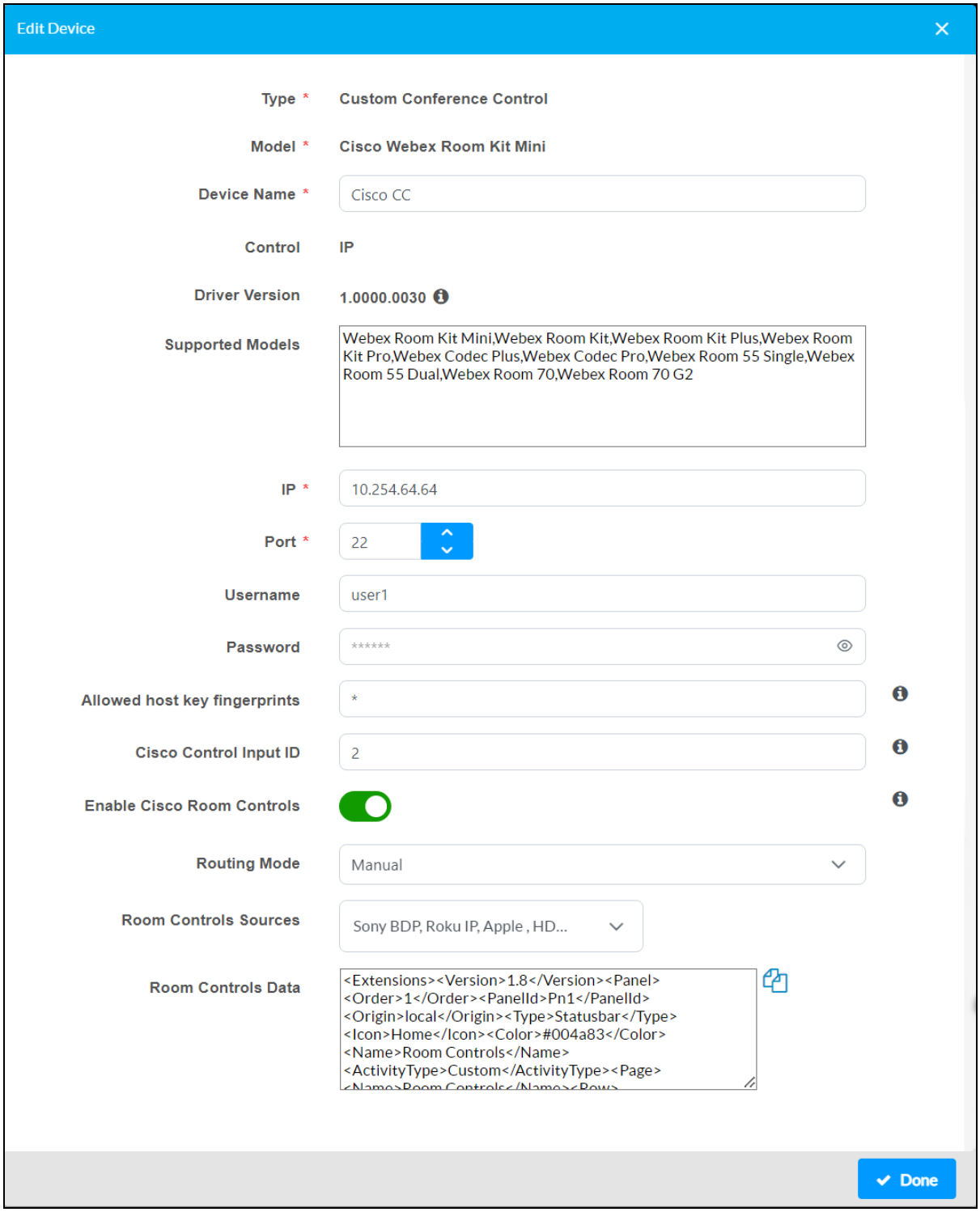
    d. Enter the required Cisco control input ID in the **Cisco Control Input ID** text field. For more information on obtaining the correct Cisco control input ID, refer to Cisco Control Input ID Reference on page 186.
7. Select **Save**. The Cisco WebEx Room Kit is added to the device list for the .AV Framework system.

    > **NOTE:** The .AV Framework system must be activated after adding the Cisco WebEx Room Kit. The Cisco WebEx Room Kit should also be added after adding and configuring all other input devices in the system, as the configuration options for the controller reflect the current input configuration for the system. For more information on configuring inputs, refer to Configuration on page 39.

8. Select the edit button  next to the Cisco WebEx Room Kit in the **Manage Devices** accordion. The **Edit Device** dialog box is displayed for the Cisco WebEx Room Kit.

9. Turn on the **Enable Cisco Room Controls** toggle to turn on Cisco Touch 10 room controls within the .AV Framework system, and the select **Next**.

Edit Devices Dialog Box - Cisco Controller



10. Use the **Routing Mode** drop-down menu to select the routing behavior for the Cisco WebEx Room Kit when an active call is detected.
    - **Manual**: The Cisco output source must be routed to any displays manually.
    - **ActiveCall**: The Cisco output source will be routed to all displays automatically.

    > **NOTE:** Observe the following points for active call routing:
    > - No routing changes occur after the call is disconnected. Any routing that was in use prior to the call must be manually reset.
    > - If a switcher output (other than the **[Cisco Controller] Capture** output) has a fixed route to a display, the call will not be routed to that output.
    > - If a switcher output (other than the **[Cisco Controller] Capture** output) has a follows route to a display, the call will also be routed to that output.

11. Use the **Room Controls Sources** drop-down menu to fill the check boxes next to the input devices that should have control buttons in the Cisco Touch 10 controller application. Any unchecked input device will not be shown.

    > **NOTE:** Switching between **Manual** and **ActiveCall** routing modes does not require a restart to the .AV Framework configuration. However, a restart is required if changes are made to the input devices in the **Edit Device** dialog box or to the input devices in the **AV Routing** settings accordion.

12. Select **Done**, then activate the .AV Framework system.

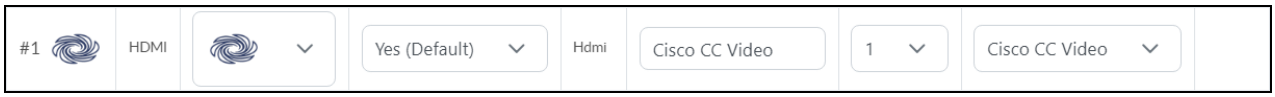
Configuration for a Custom Conferencing Device

If you are using a custom conferencing device and the output is connected to your .AV Framework switcher device, the following additional configuration is recommended:

> **NOTE:** The Cisco WebEx Room Kit must first be added to the .AV Framework system as described in the previous procedure. Adding the Cisco WebEx Room Kit will expose a **Video** device type for the switcher input and a **Capture** device type for the switcher output. The user-defined name created for the Cisco WebEx Room Kit is added to the beginning of these selection names.

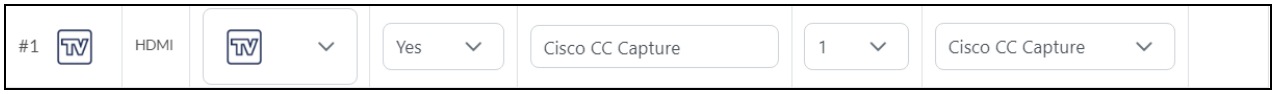
1. Navigate to **Settings** > **AV Routing** within the .AV Framework web configuration interface.
2. Select the **[Cisco Controller] Video** device type on the switcher input that is connected to the custom conferencing device.

   AV Routing Accordion - Video Switcher Input



3. Select the **[Cisco Controller] Capture** device type on the switcher output that is connected to the custom conferencing device input.

   AV Routing Accordion - Capture Switcher Output



> **NOTE:** The **[Cisco Controller] Capture** output cannot be set to use fixed or follows routing. If **[Cisco Controller] Capture** is selected for an output that previously was set to use fixed or follows routing, the routing setting will be cleared.

4. Activate the .AV Framework system.

Cisco Control Input ID Reference

Use the following table to determine the correct Cisco control input ID to use when adding a new Cisco WebEx Room Kit to the .AV Framework system. The input ID is determined based on your Cisco device and the input used for the connection.

Cisco Device	HDMI 1	HDMI 2	HDMI 3	HDMI 4	HDMI 5	DVI 4
WebEx Room Kit	2					
WebEx Room Kit Mini	2					
WebEx Room Kit Plus		2	3			
WebEx Room Kit Pro			3	4	5	
WebEx Codec Plus		2	3			
WebEx Codec Pro			3	4	5	
WebEx Room 55 Single			3			4
WebEx Room 55 Dual			3			4
WebEx Room 70			3	4	5	
WebEx Room 70 G2			3	4	5	
SX80 Codec			3			4

Transfer Room Control Data for Cisco Serial Drivers

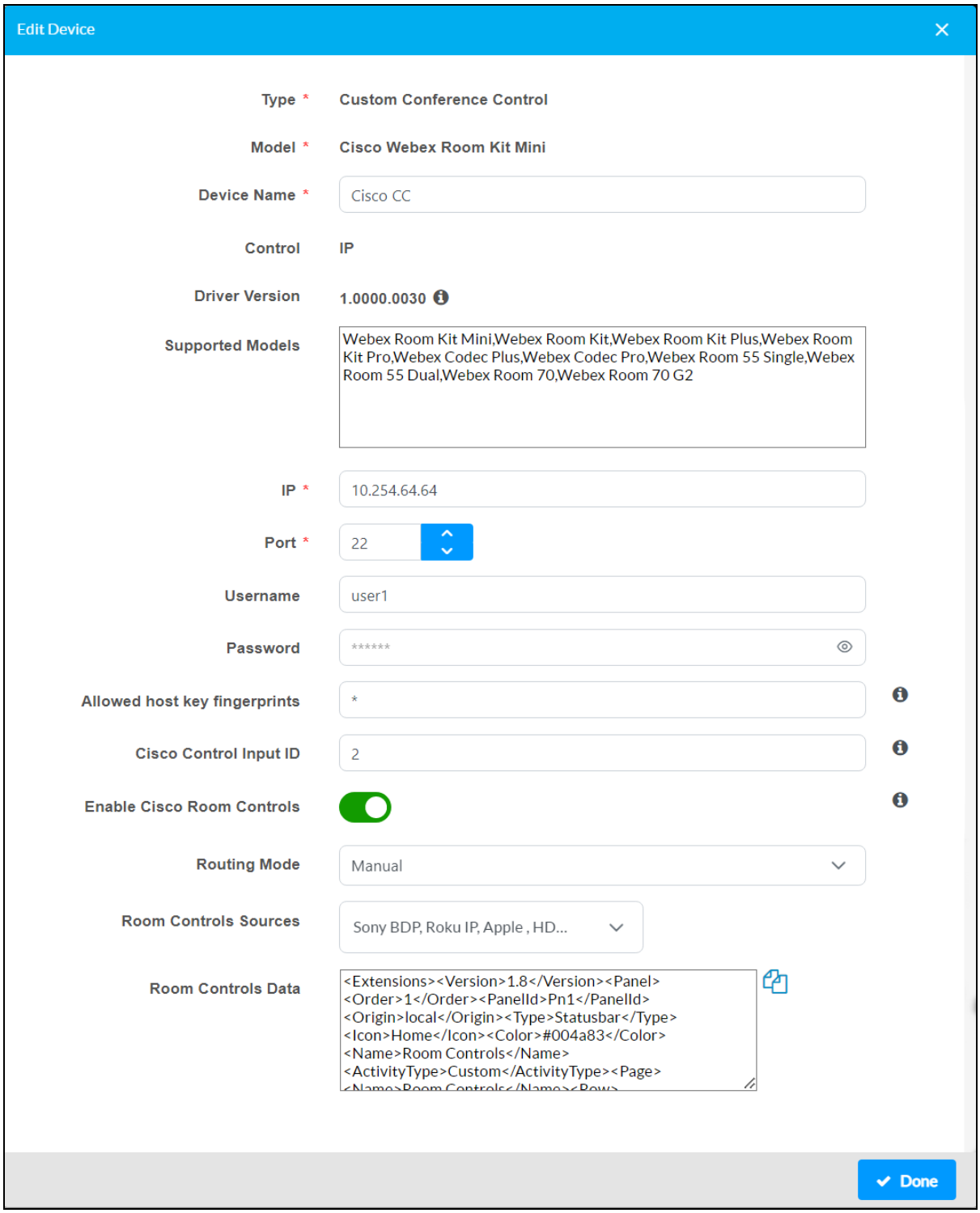
When using a serial Cisco Touch 10 driver, room control data is not transferred automatically from .AV Framework to the Cisco WebEx Room Kit device after changes are made to the driver configuration. The room control data must be saved as an XML file and transferred manually to the Cisco WebEx Room Kit device.

NOTE: The room controls XML file should be transferred to the Cisco WebEx Room Kit device when the .AV Framework system is turned off. The AVF controller has no knowledge that an XML file was uploaded to the Cisco WebEx Room Kit device, so it will not resend current button states.

To transfer room control data manually to the Cisco WebEx Room Kit device:

1. Select the edit button next to the Cisco WebEx Room Kit in the **Manage Devices** accordion. The **Edit Device** dialog box is displayed for the Cisco WebEx Room Kit.

Edit Devices Dialog Box - Cisco Controller



2. Select the copy button next to **Room Controls Data** to copy the provided JSON output to the clipboard of the local computer.
3. Copy the JSON output to Notepad or a similar application, and then save the JSON output as an XML file.

   > **NOTE:** Alternately, the XML file for the room controls data can be obtained by connecting to the .AV Framework controller over an SFTP client, navigating to the **/user/avf/config/** directory, and then downloading the **Cisco-CiscoConfig.xml** file.

4. Log into the web configuration interface for the Cisco WebEx Room Kit device.
5. Select **UI Extensions Editor** in the left navigation menu.
6. If there are existing room controls for the device:
   a. Open the context menu in the top right corner of the page and select **Remove all UI extensions**. A confirmation dialog is displayed.
   b. Select **Yes** to confirm the removal.
   c. Open the context menu in the top right corner of the page and select **Export to video system** to clear the existing room controls.
7. To load the new room controls:
   a. Open the context menu in the top right corner of the page and select **Import from file**.
   b. When prompted, navigate to the room controls XML file that is saved to the local computer and import it to the device.
   c. After the XML file is imported, open the context menu in the top right corner of the page and select **Export to video system** to export the new room controls to the device.

Appendix H: Configure Microsoft Teams Custom Conferencing

.AV Framework provides functionality that allows for custom conferencing via the Microsoft Teams® software application. Once this functionality is configured, the **Present** screen in the .AV Framework system can be accessed from the Microsoft Teams user interface via a UC-ENGINE device.

The following procedure describes how to configure Microsoft Teams custom conferencing for .AV Framework.

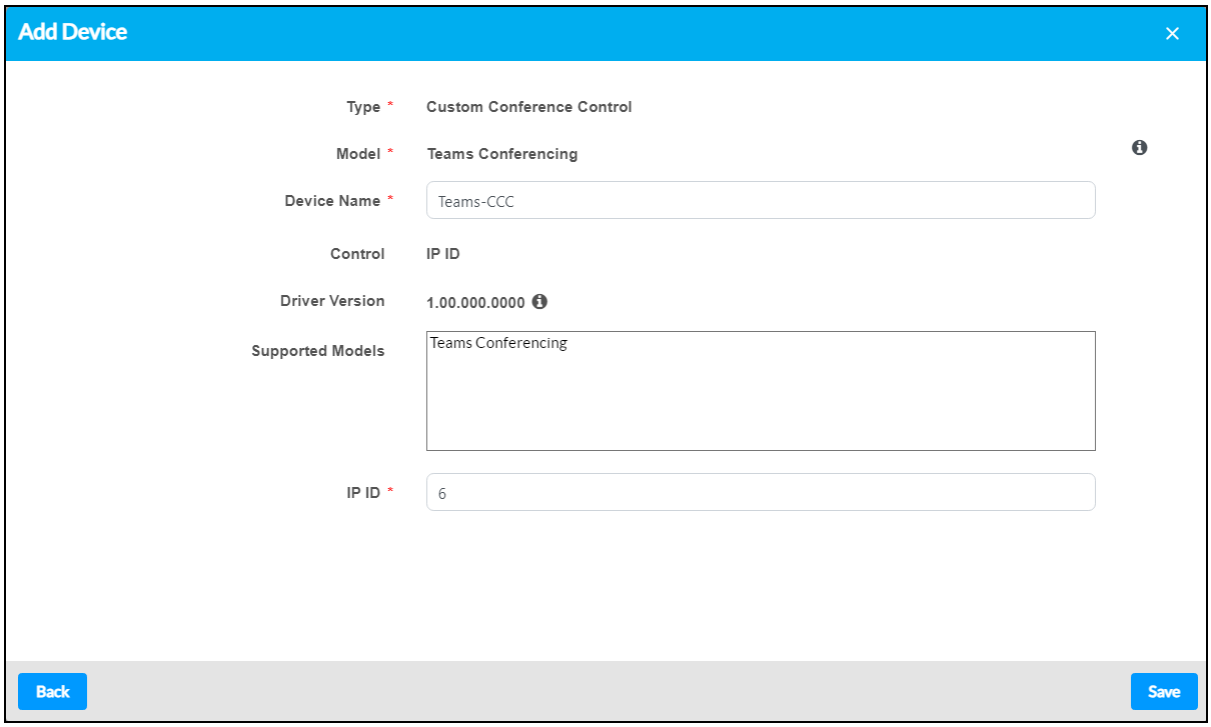
> **NOTE:** A Microsoft Teams software account is required to use this functionality. Contact your IT administrator for assistance.

.AV Framework Configuration

1. Navigate to **Settings** > **Manage Devices** within the .AV Framework web configuration interface.
2. Select **Add Device**. The **Add Device** dialog box is displayed.
3. Navigate to and select the appropriate Microsoft Teams device driver in the provided table. For more information on adding devices, refer to Manage Devices on page 74.
4. Enter a descriptive name for the device in the **Device Name** text field.
5. Select **Next**. Additional information and settings for the device are displayed.

   > **NOTE:** The Microsoft Teams device driver is imported from the cloud and installed into the .AV Framework system automatically.

Add Device Dialog Box - Custom Conference Control



6. Select **Save**. The Microsoft Teams device is added to the device list for the .AV Framework system.

> **NOTE:** The .AV Framework system must be activated after adding the Microsoft Teams device. The Microsoft Teams device should also be added after adding and configuring all other input devices in the system, as the configuration options for the device reflect the current input configuration for the system. For more information on configuring inputs, refer to Configuration on page 39.

The following additional configuration is also recommended to configure the UC-ENGINE device output that is connected to the .AV Framework switcher device:

> **NOTE:** The Microsoft Teams device must first be added to the .AV Framework system as described in the procedure above. Adding the Microsoft Teams device will expose a **Video** device type for the switcher input and a **Capture** device type for the switcher output. The user-defined name created for the Microsoft Teams device is added to the beginning of these selection names.

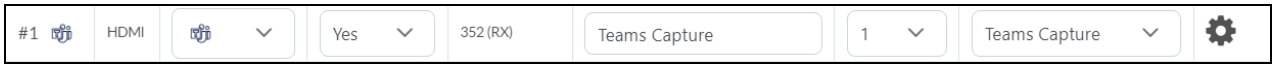
1. Navigate to **Settings** > **AV Routing** within the .AV Framework web configuration interface.
2. Select the **[Microsoft Teams] Video** device type on the switcher input that is connected to the UC-ENGINE.

AV Routing Accordion - Video Switcher Input



3. Select the **[Microsoft Teams] Capture** device type on the switcher output that is connected to the UC-ENGINE input.

   AV Routing Accordion - Capture Switcher Output

   > **NOTE:** The **[Microsoft Teams] Capture** output cannot be set to use fixed or follows routing. If **Microsoft Teams Capture** is selected for an output that previously was set to use fixed or follows routing, the routing setting will be cleared.

4. Activate the .AV Framework system.

UC-ENGINE Device Configuration

Use the following procedure to configure the Microsoft Teams custom conferencing project for the UC-ENGINE device.

1. Open the **Crestron Settings App** on the UC-ENGINE device as described in the Crestron Flex Unified Communications Solution Product Manual.
2. Select **Load Project** from the navigation menu.
3. Load the required .AV Framework UI VTZ project to the UC-ENGINE as described in the Crestron Flex Unified Communications Solution Product Manual.
4. Select **IP Table** from the navigation menu.
5. Create a new IP table entry for the AVF controller that is running Microsoft Teams custom conferencing as described in the Crestron Flex Unified Communications Solution Product Manual.

   > **NOTE:** Do not change the port value from its default setting (41794).

6. Select **Done**, and then restart the UC-ENGINE.

An updated Microsoft Teams UI should be shown on the connected touch screen or XPanel after the UC-ENGINE restarts. A slider control button is shown on the bottom right of the Microsoft UI that, when pressed, performs a page flip to the .AV Framework **Present** screen. Tap the black border around the **Present** screen or wait until the timeout period expires to flip back to the Microsoft Teams UI.

TSW/TS-70 Series Device Configuration (Optional)

A TSW-70 or TS-70 series touch screen can also be configured to display the Microsoft Teams custom conferencing project.

1. Access the device web configuration interface as described in the TSW-70 Series Product Manual.
2. Navigate to **Settings** > **Applications**.
3. Select **Teams Video** from the **Applications** drop-down menu.

4. Select **Save Changes** from the **Action** menu, and then restart the touch screen when prompted.
5. After the touch screen restarts, navigate back to **Settings** > **Applications**.
6. Enter the following additional information for the Teams Video application:
    - **Teams Video PC Address**: Enter the IP address of the UC-ENGINE running the .AV Framework UI VTZ project.
    - **Teams Video PC Port**: Enter the port number UC-ENGINE running the .AV Framework UI VTZ project.
    - **Teams Video Username**: Enter the username for the UC-ENGINE admin account.
    - **Teams Video Password**: Enter the password for the UC-ENGINE admin account.
7. Select **Save Changes** from the **Action** menu. The touch screen attempts to connect to the UC-ENGINE.

If the connection to the UC-ENGINE is successful, the Microsoft Teams UI with the .AV Framework UI page flip is shown on the touch screen.

Appendix I: Configure Google Meet Custom Conferencing

.AV Framework provides functionality that allows for custom conferencing via the Google Meet™ video conferencing system. Once this functionality is configured, the **Present** screen in the .AV Framework system can be accessed from the Google Meet user interface via a compatible third-party controller.

The following procedure describes how to configure Google Meet custom conferencing for .AV Framework.

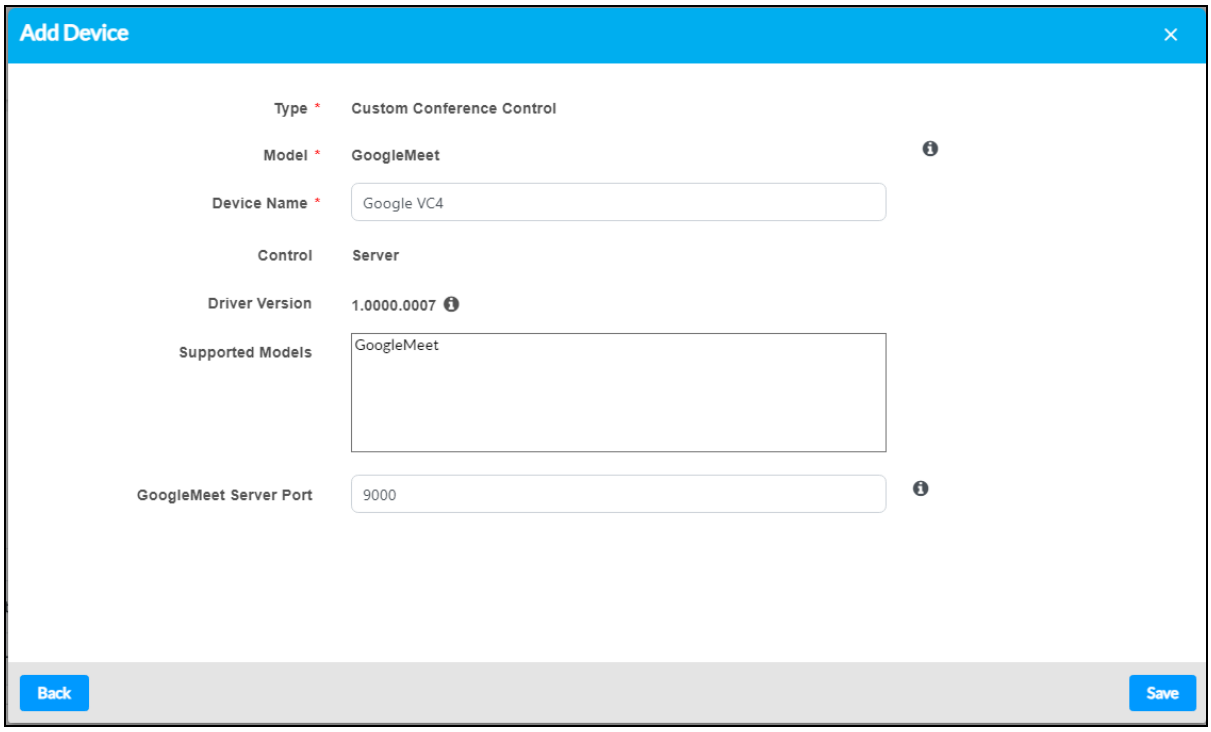
> **NOTE:** A Google Meet account is required to use this functionality. Contact your IT administrator for assistance.

.AV Framework Configuration

1. Navigate to **Settings** > **Manage Devices** within the .AV Framework web configuration interface.
2. Select **Add Device**. The **Add Device** dialog box is displayed.
3. Navigate to and select the appropriate Google Meet device driver in the provided table. For more information on adding devices, refer to Manage Devices on page 74.
4. Enter a descriptive name for the device in the **Device Name** text field.
5. Select **Next**. Additional information and settings for the device are displayed.

   > **NOTE:** The Google Meet device driver is imported from the cloud and installed into the .AV Framework system automatically.

Add Device Dialog Box - Custom Conference Control

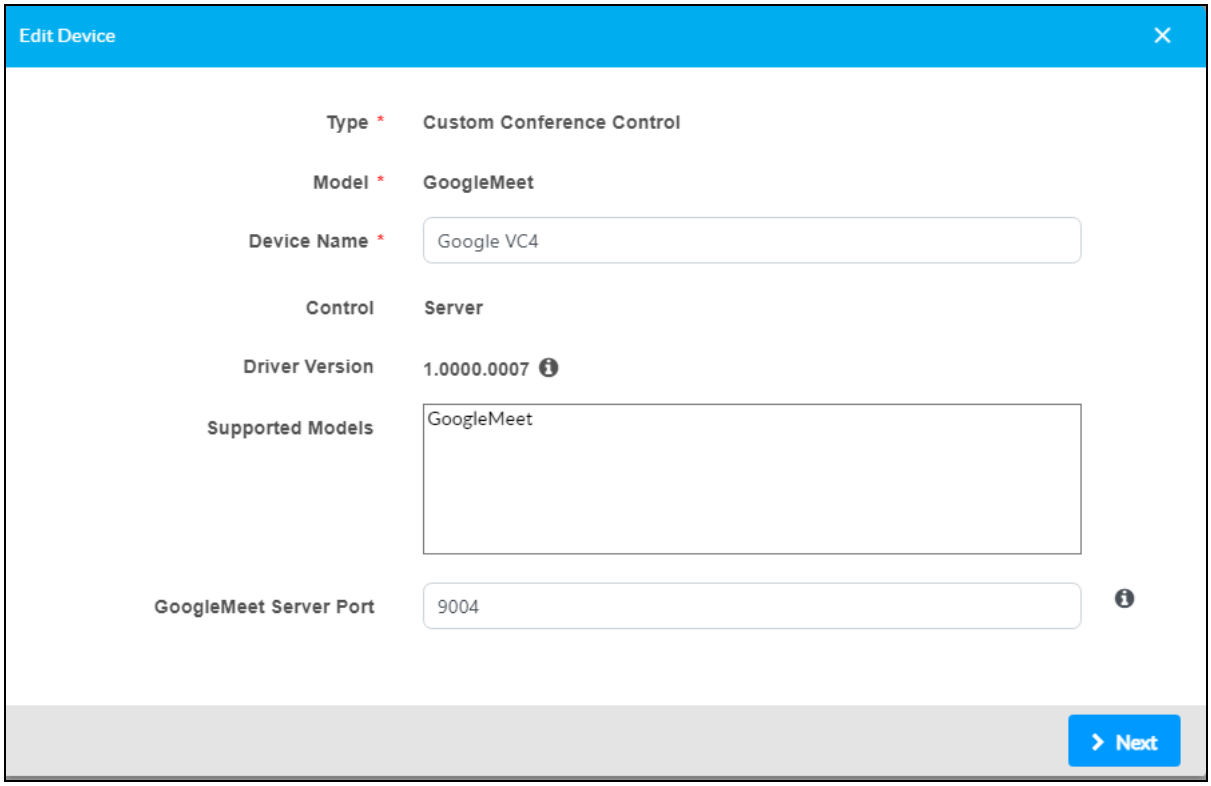


6. Enter the network port used by the Google Meet server. This information is provided by your IT administrator.
7. Select **Save**. The Google Meet device is added to the device list for the .AV Framework system.

> **NOTE:** The .AV Framework system must be activated after adding the Google Meet device. The Google Meet device should also be added after adding and configuring all other input devices in the system, as the configuration options for the device reflect the current input configuration for the system. For more information on configuring inputs, refer to Configuration on page 39.

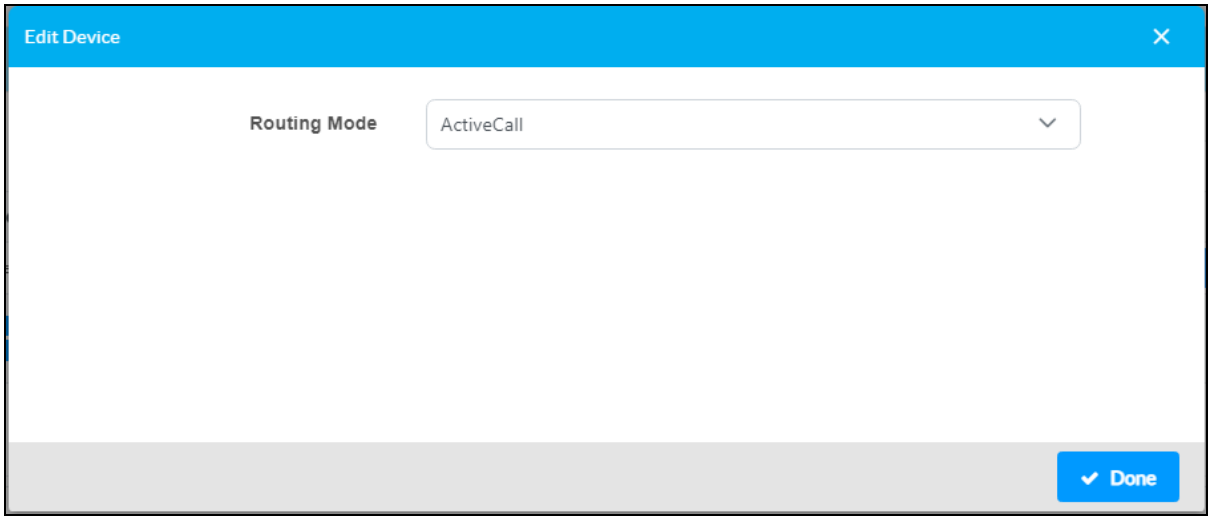
8. Select the edit button next to the Google Meet device in the **Manage Devices** accordion. The **Edit Device** dialog box is displayed for the Google Meet device.

Edit Devices Dialog Box - Google Meet Device



9. Select **Next** to display additional configuration options.

Edit Devices Dialog Box - Google Meet Device



10. Use the **Routing Mode** drop-down menu to select the routing behavior for the Google Meet device when an active Google Meet call is detected.
    - **Manual**: The Google Meet output source must be routed to any displays manually.
    - **ActiveCall**: The Google Meet output source will be routed to all displays automatically.

    > **NOTE:** Observe the following points for active call routing:
    > - No routing changes occur after the Google Meet call is disconnected. Any routing that was in use prior to the Google Meet call must be manually reset.
    > - If a switcher output (other than the **[Google Meet] Capture** output) has a fixed route to a display, the Google Meet call will not be routed to that output.
    > - If a switcher output (other than the **[Google Meet] Capture** output) has a follows route to a display, the Google Meet call will also be routed to that output.

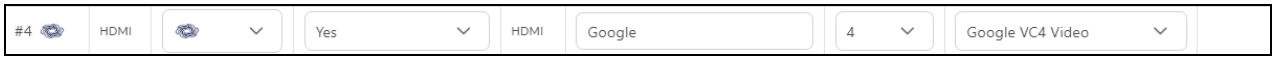
11. Select **Done**.

The following additional configuration is also recommended to configure a UC-ENGINE device output that is connected to the .AV Framework switcher device:

> **NOTE:** The Google Meet device must first be added to the .AV Framework system as described in the procedure above. Adding the Google Meet device will expose a **Video** device type for the switcher input and a **Capture** device type for the switcher output. The user-defined name created for the Google Meet device is added to the beginning of these selection names.

1. Navigate to **Settings** > **AV Routing** within the .AV Framework web configuration interface.
2. Select the **[Google Meet] Video** device type on the switcher input that is connected to the UC-ENGINE.

   AV Routing Accordion - Video Switcher Input

3. Select the **[Google Meet] Capture** device type on the switcher output that is connected to the UC-ENGINE input.

   AV Routing Accordion - Capture Switcher Output

   > **NOTE:** The **[Google Meet] Capture** output cannot be set to use fixed or follows routing. If **[Google Meet] Capture** is selected for an output that previously was set to use fixed or follows routing, the routing setting will be cleared.

4. Activate the .AV Framework system.

Crestron Electronics, Inc.
15 Volvo Drive, Rockleigh, NJ 07647
Tel: 888.CRESTRON
Fax: 201.767.7656
www.crestron.com

Operations Guide — Doc. 8275AU
06/16/26
Specifications subject to
change without notice.