# DM-NVX-E10 and DM-NVX-D10

## DM NVX® 1080p60 4:4:4 Network AV Encoder and Decoder

Product Manual

Crestron Electronics, Inc.

**Original Instructions**
The U.S. English version of this document is the original instructions.
All other languages are a translation of the original instructions.

**Regulatory Model:** M202028003

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# Overview

The Crestron DM-NVX-E10 and DM-NVX-D10 are compact AV-over-IP devices designed to transport video with resolutions up to 1080p over standard Gigabit Ethernet. The DM-NVX-E10 functions as an encoder, and the DM-NVX-D10 functions as a decoder.

This section provides the following information about the DM NVX® devices:


- Features
- Physical description


# Features

Features of the DM-NVX-E10 and DM-NVX-D10 include the following:

- Support of video resolutions up to 1080p 4:4:4 over standard Gigabit Ethernet
- Real-time video performance over the network
- Enterprise-grade security including 802.1X, Active Directory® credential management, TLS, and AES-128
- HDCP 1.4 compliance
- DM-NVX-E10 encoder functionality for use with the DM-NVX-D10 or other DM NVX® products that can function as decoders
- DM-NVX-D10 decoder functionality for use with the DM-NVX-E10 encoder and support for other DM NVX® products that can function as encoders
- One HDMI® input (DM-NVX-E10 only)
- One HDMI output (DM-NVX-D10 only)
- Fixed or adaptive bit rate (DM-NVX-E10 only)
- Analog audio de-embedding
- 7.1 surround sound audio
- AES67 audio embedding and de-embedding
- Copper Ethernet connectivity with PoE support
- Automatic DM-NVX-E10 point-to-point connectivity with the DM-NVX-D10, DM-NVX-D20, or DM-NVX-D200
- Automatic DM-NVX-D10 point-to-point connectivity with the DM-NVX-E10
- Device control via RS-232, IR, and CEC
- Easy setup using built-in web pages
- Compatibility with Crestron 3-Series® control systems or later
- Streamlined management using DM NVX Director® virtual switching appliances
- .AV Framework™ technology support

- XiO Cloud® service support
- Crestron Home® OS support
- API for full control of the DM NVX devices
- Compact, surface-mountable design
- Powered via PoE or optional power pack

## Real-Time 1080p60 Video Performance

Engineered for demanding conference room and classroom applications, the DM NVX devices ensure real-time, full-motion 1080p60 video performance for the presentation of multimedia, videoconferencing, and live camera images. Interactive functions such as gameplay and the use of a mouse are fluid and natural.

A DM NVX system is engineered for stability and ultimate reliability. Line-synchronized outputs ensure perfect synchronization of content across multiple displays for applications such as digital signage. Variable Multicast TTL (Time-To-Live) enables traversing multiple network routers for optimal flexibility.

## Enterprise-Grade Security

Using advanced security features and protocols such as 802.1X authentication, Active Directory credential management, AES-128 content encryption, PKI authentication, TLS, SSH, and HTTPS, a DM NVX system delivers a true enterprise-grade network AV solution engineered to fulfill demanding IT policies.

## Encoder Functionality (DM-NVX-E10 Only)

The DM-NVX-E10 encoder provides one HDMI input that enables a laptop computer, camera, or other media source to be connected via an HDMI cable and then transmitted over the network to one or many decoders. Compatible with the DM-NVX-D10 and other DM NVX products that can function as decoders, the DM-NVX-E10 can be used in any DM NVX network AV design.

## Decoder Functionality (DM-NVX-D10 Only)

The DM-NVX-D10 provides decoder functionality designed for use with the DM-NVX-E10 encoder. Both the DM-NVX-D10 and DM-NVX-E10 support resolutions up to 1080p60. The DM-NVX-D10 receives a signal from the DM-NVX-E10 and feeds it to a local display device via the HDMI output.

**NOTE:** In addition to the DM-NVX-E10, the DM-NVX-D10 is also interoperable with other DM NVX products that can function as encoders. The resolution of the encoder must be configured so that it does not exceed the maximum resolution of the DM-NVX-D10. If the DM-NVX-D10 is used with a DM NVX encoder other than the DM-NVX-E10, DM-NVX-E20, or DM-NVX-E20-2G, the stream type of the encoder must be configured to interoperate with the DM-NVX-D10. Configuration of the encoder is accomplished by using the web interface or a control system.

It is recommended that the DM-NVX-D10 not be used with 4K60 4:4:4 encoders (for example, the DM-NVX-36x[C] Series) or with the 4K60 4:2:0 encoders (for example, the DM-NVX-E20) in order to maintain the higher resolutions supported by the 4K60 4:4:4 and 4K60 4:2:0 encoders.

## Fixed or Adaptive Bit Rate (DM-NVX-E10 Only)

The bit rate of a stream can be set to a fixed or adaptive bit rate. A fixed bit rate, also referred to as Constant Bit Rate (CBR), is user specified and can be set to a value ranging from 200 Mbps to 950 Mbps.

Adaptive bit rate (ABR) enables the encoder to automatically set a fixed bit rate based on the input resolution of the stream. For example, the adaptive bit rate for a resolution such as 1920x1080p@60Hz (1080p60) would automatically be set to 400 Mbps. Adaptive bit rate makes better use of the available bandwidth than a user-specified fixed bit rate.

The web interface or a control system can be used to set a fixed bit rate or to enable adaptive bit rate functionality.

## Analog Audio De-embedding

The analog audio output provides a stereo line-level signal to feed a local sound system or sound bar. The output volume is adjustable via a control system or web browser.

**NOTE:** The analog audio output is functional only when the DM NVX device is receiving a 2-channel stereo input signal.

## 7.1 Surround Sound Audio

DM NVX technology supports the lossless transport of 7.1 surround sound audio signals, including Dolby® TrueHD, Dolby Atmos®, DTS HD®, DTS:X®, and uncompressed linear PCM.

## AES67 Audio Embedding and De-embedding

AES67 support enables the selected audio source to be transmitted as a 2-channel AES67 audio stream while another 2-channel AES67 audio stream is received from a Crestron® DSP or other third-party device. For the DM-NVX-D10, the AES67 audio stream that is received can be combined with the video signal and then output via the HDMI output and analog audio output.

For the DM-NVX-E10, the received AES67 audio stream can be output via the analog audio output.

> **NOTE:** An AES67 stream that is received by a DM NVX endpoint cannot be transmitted from that endpoint.

## Copper Ethernet Connectivity

The DM NVX device includes one RJ-45 1000BASE-T Ethernet port. The port is PoE compliant, enabling the device to be powered via a PoE Ethernet switch. For information about network requirements and guidelines, refer to the DM NVX AV-over-IP System Design Guide.

## Automatic Point-to-Point Connectivity

For the DM-NVX-E10, automatic point-to-point connectivity enables the encoder to be connected directly to the DM-NVX-D10, DM-NVX-D20, or DM-NVX-D200 in order to stream video and audio. For the DM-NVX-D10, automatic point-to-point connectivity enables the decoder to be connected directly to a DM-NVX-E10 to stream video and audio.

By default, point-to-point mode automatically detects whether an encoder is connected directly to a supported decoder or to a 1000BASE-T switch. Similarly, point-to-point mode automatically detects whether a decoder is connected directly to a supported encoder or to a 1000BASE-T switch. When a direct connection between the encoder and decoder is detected, the devices operate in point-to-point mode without the need for additional configuration. The web interface or a control system can be used to disable point-to-point mode or to enable automatic detection of point-to-point connectivity.

## Device Control via RS-232, IR, and CEC

The DM-NVX-E10 includes COM (RS-232) and IR ports for control of source devices under the management of a control system. Additional control capability is provided by CEC (Consumer Electronics Control) over the HDMI connection. Under the management of a control system, the DM-NVX-E10 can control a source device via CEC, potentially eliminating the need for dedicated serial cables or IR emitters.

The DM-NVX-D10 also includes COM (RS-232) and IR ports for control of devices under the management of a control system. Additional control capability is also provided by CEC over the HDMI connection. Under the management of a control system, the DM-NVX-D10 can control the display device via CEC, potentially eliminating the need for dedicated serial cables or IR emitters. The COM port, IR port, and CEC over the HDMI output can also enable the display device to be turned on or off automatically without the use of a control system.

## Web-Based Setup

Setup of the DM NVX device is accomplished by using a web browser. Full control and monitoring of the device is enabled through integration with a control system or with a DM NVX Director® virtual switching appliance.

## Streamlined Management Using DM NVX Director Virtual Switching Appliances

Use of a DM NVX Director virtual switching appliance (DM-NVX-DIR-80, DM-NVX-DIR-160, or DM-NVX-DIR-ENT) streamlines the entire configuration and control process. A DM NVX Director appliance provides a central point of management and enables the creation of multiple virtual matrix switchers through one easy-to-use web-based portal.

## Compact, Surface-Mountable Design

The DM NVX devices mount conveniently to a flat surface or rack rail. The DM-NVX-E10 fits easily beneath a tabletop or inside a lectern, AV cart, or equipment cabinet. The DM-NVX-D10 fits easily behind a flat panel display, above a ceiling-mounted projector, or inside an AV cart or equipment cabinet. All connectors and LED indicators are positioned on the front and rear of the devices, offering optimal access and visibility for a clean, serviceable installation. Power is provided via PoE or an optional power pack (sold separately).

*For additional information about DM NVX technology and the DM NVX product family, refer to the DM NVX web page at www.crestron.com/nvx.*

# Physical Description

This section provides information about the front and rear panels of the DM-NVX-E10 and DM-NVX-D10.

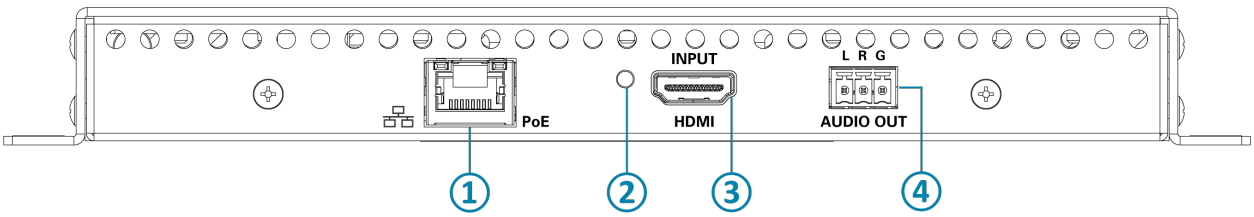
## DM-NVX-E10

The front and rear panels of the DM-NVX-E10 provide connectors, controls, and indicators as shown in the following sections.

### Front Panel

The following illustration shows the front panel of the DM-NVX-E10.

**DM-NVX-E10 Front Panel**




① **Ethernet Port:** 100BASE-TX/1000BASE-T PoE PD (powered device) port for connection to a PoE compliant Gigabit Ethernet switch or third-party PoE PSE;
Green LED, lights to indicate that an Ethernet link is established;
Amber LED, lights to indicate Ethernet activity

② **HDMI INPUT LED:** Green LED, lights to indicate that a sync is detected at the HDMI input

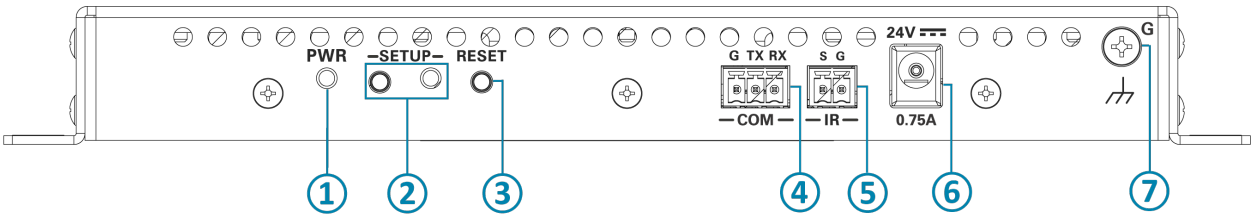
③ **HDMI INPUT Port:** HDMI digital audio/video input port for connection to an audio/video source device;
DVI and Dual-Mode DisplayPort interface compatible with the use of the appropriate adapter or interface cable

④ **AUDIO OUT Port:** Unbalanced stereo line-level audio output port for connection to an analog audio output device, functional only when the DM NVX device is receiving a 2-channel stereo input signal

## Rear Panel

The following illustration shows the rear panel of the DM-NVX-E10.

**DM-NVX-E10 Rear Panel**




1. **PWR LED:** Lights when power is being supplied via PoE or the optional power pack (sold separately). Amber indicates that the device is booting. Green indicates that the device is operational.
2. **SETUP Push Button and LED:** Red LED, lights when the **SETUP** push button is pressed and times out automatically

   > **NOTE:** The **SETUP** button can be used to restore the device to factory default settings (refer to Using the SETUP Button for information).

3. **RESET Push Button:** Recessed push button, reboots the device
4. **COM Port:** Bidirectional RS-232 port for connection to an RS-232 device
5. **IR Port:** IR output/serial port for connection to an IR controllable device (Crestron IRP2 emitter sold separately)
6. **24V 0.75A Power Connector:** 24 VDC power input for connection to optional PW-2407WU power pack (sold separately)
7. **Ground:** Chassis ground lug for connection to building steel

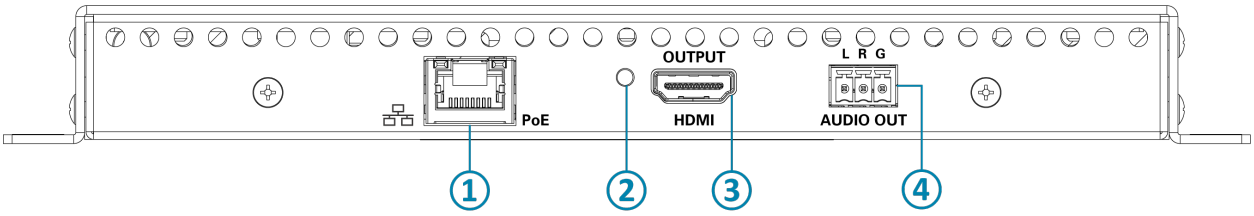
# DM-NVX-D10

The front and rear panels of the DM-NVX-D10 provide connectors, controls, and indicators as shown in the following sections.

## Front Panel

The following illustration shows the front panel of the DM-NVX-D10.

**DM-NVX-D10 Front Panel**




① **Ethernet Port:** 100BASE-TX/1000BASE-T PoE PD (powered device) port for connection to a PoE compliant Gigabit Ethernet switch or third-party PoE PSE
Green LED, lights to indicate that an Ethernet link is established
Amber LED, lights to indicate Ethernet activity

② **HDMI OUTPUT LED:** Green LED, lights to indicate that a video signal is being transmitted at the HDMI output

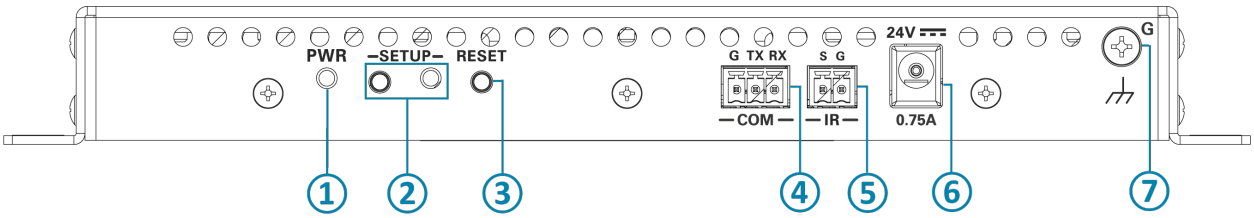
③ **HDMI OUTPUT Port:** HDMI digital audio/video output for connection to a display device; DVI compatible with the use of the appropriate adapter or interface cable

④ **AUDIO OUT Port:** Unbalanced stereo line-level audio output for connection to an audio output device, functional only when the DM NVX device is receiving a 2-channel stereo input signal

## Rear Panel

The following illustration shows the rear panel of the DM-NVX-D10.

**DM-NVX-D10 Rear Panel**




1. **PWR LED:** Indicates that power is being supplied via PoE or the optional power pack (sold separately). Amber indicates that the device is booting. Green indicates that the device is operational.
2. **SETUP Push Button and LED:** Red LED, indicates that the **SETUP** push button is pressed and times out automatically.

   > **NOTE:** The **SETUP** button can be used to restore the device to factory default settings (refer to Using the SETUP Button for information).

3. **RESET Push Button:** Recessed push button, reboots the device
4. **COM Port:** Bidirectional RS-232 port for connection to RS-232 device
5. **IR Port:** IR output/serial port for connection to IR controllable device (Crestron IRP2 emitter sold separately)
6. **24V 0.75A Power Connector:** 24 VDC power input for connection to optional PW-2407WU power pack (sold separately)
7. **Ground:** Chassis ground lug for connection to building steel

# Specifications

For product specifications, refer to the following product pages on the Crestron website:

- DM-NVX-E10
- DM-NVX-D10

# Installation

For installation information, refer to the DM-NVX-E10 and DM-NVX-D10 Quick Start on the Crestron website.

# Configuration

**NOTE:** Prior to configuration, ensure that the latest firmware is running on the device. For instructions to update the firmware, refer to Updating Firmware.

The DM-NVX-E10 and DM-NVX-D10 provide a built-in web interface that enables viewing of device status and configuration of the device.

This section provides information about the following:

- Accessing the web interface
- Navigating the web interface
- Saving configuration changes
- Viewing status information
- Configuring setup and operational settings
- Configuring security settings
- Configuring IEEE 802.1X settings

# Accessing the Web Interface

The following table lists the supported operating systems and corresponding web browsers that can be used to access the web interface.

**Supported Operating Systems and Corresponding Web Browsers**

| Operating System | Supported Web Browser |
|---|---|
| Windows® operating system | Chrome™ web browser, version 96.0.4664.110 or later |
| | Firefox® web browser, version 94.0.2 or later |
| | Microsoft Edge® web browser, version 96.0.1054.62 or later |
| macOS® operating system | Safari® web browser, version 14.0.3 or later |

To access the web interface:

1. Using the Device Discovery tool in the Crestron Toolbox™ software, find the IP address of the DM NVX device.
2. Open a web browser.

3. Go to the IP address of the DM NVX device.

   **NOTE:** If an IPv6 address is used to access the web interface, brackets must enclose the address that is being entered, for example:

   ```
   https://[2600:800:e37f::2e]/
   ```

   If the IPv6 address is a link-local address, the zone ID with a % delimiter must also be entered, for example:

   ```
   https://[fe80::86bb:69ff:fecf:7860%eth0]/
   ```

   The default zone ID for DM NVX devices is **eth0**.

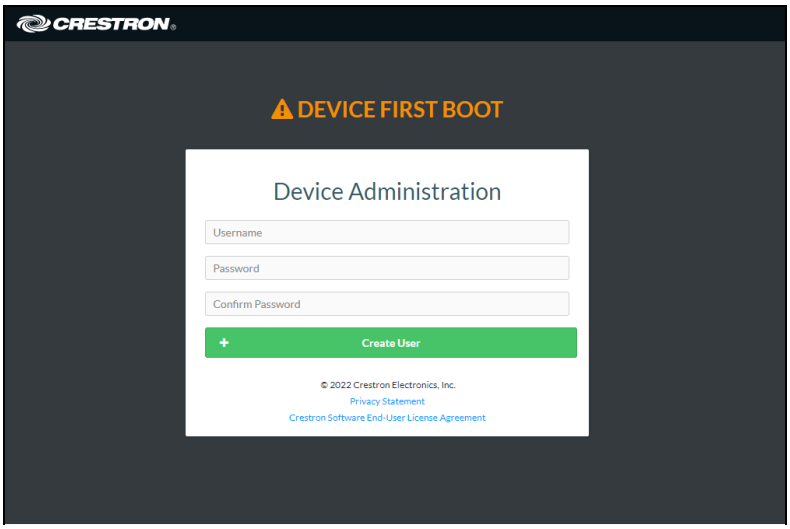
   For additional IPv6 information related to DM NVX devices, refer to Online Help Answer ID 1001763.

   The Device Administration page opens:

   - If no user account has been created, continue with step 4 to create an account.
   - If an account has already been created, omit step 4 and proceed to step 5.

4. If no user account has been created, create an account as indicated on the Device Administration page.

   **Device Administration Page - Create User**

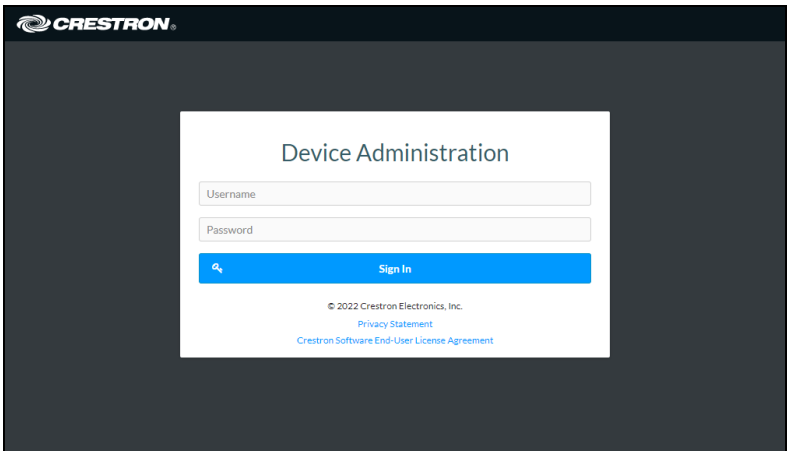
   
   

   a. In the **Username** text box, enter a username. The username is not case sensitive.
   b. In the **Password** text box, enter a password using a minimum of 8 characters. The password is case sensitive.
   c. In the **Confirm Password** text box, reenter the password for confirmation.
   d. Click **Create User**.

      The Device Administration page reopens. Continue with step 5.

5. Sign in to the device as indicated on the Device Administration page.

**Device Administration Page - Sign In**

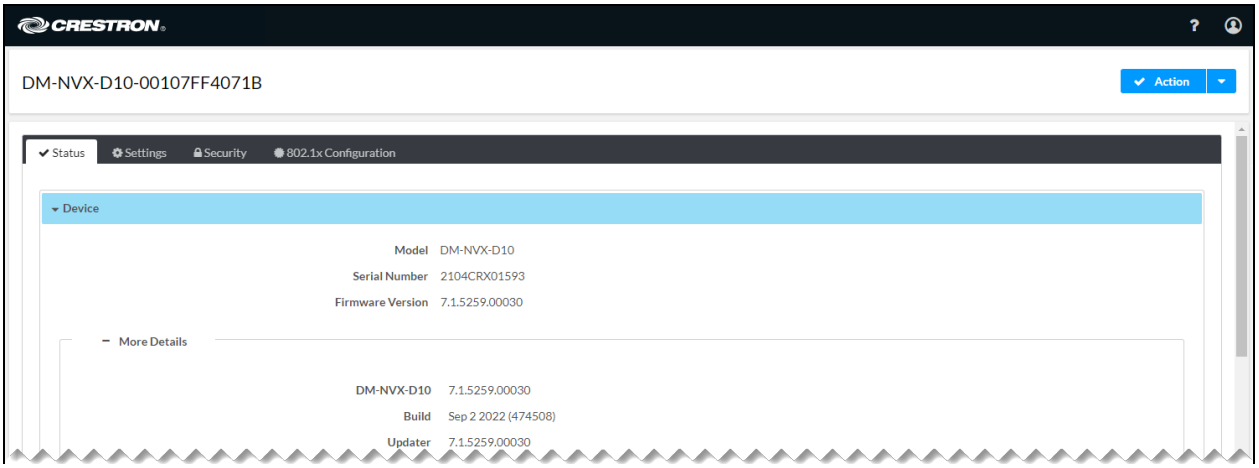



   a. In the **Username** text box, enter the username. The user name is not case sensitive.
   b. In the **Password** text box, enter the password. The password is case sensitive.
   c. Click **Sign In**. The web interface opens.

# Navigating the Web Interface

After signing in to the web interface, the web interface appears as shown in the sample screen below.

**Web Interface (Sample DM-NVX-D10 Screen Shown)**




The web interface provides the following navigation tabs:

- Status (refer to Viewing Status Information for information)
- Settings (refer to Configuring Setup and Operational Settings for information)
- Security (refer to Configuring Security Settings for information)
- 802.1x Configuration (refer to Configuring IEEE 802.1X Settings for information)

In addition to the navigation tabs, an **Action** menu is provided in the upper-right corner of the web interface. The **Action** menu enables configuration changes to be saved (refer to Saving Configuration Changes for information).

The **Action** menu also enables the following device management functions to be performed:

- Rebooting the device
- Restoring factory default settings
- Updating firmware
- Downloading device logs
- Managing certificates
- Managing EDIDs (encoder only)

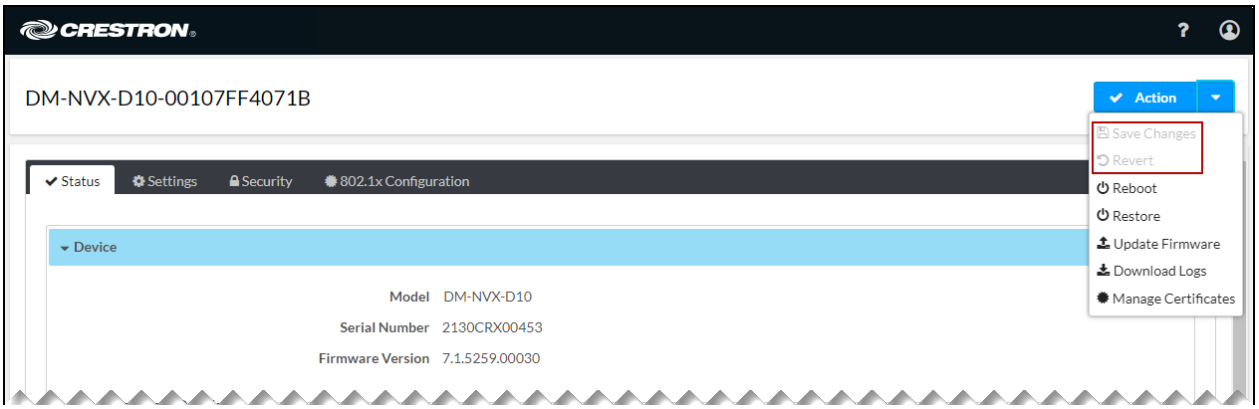
# Saving Configuration Changes

Changes to configuration settings in the **Settings**, **Security**, and **802.1x Configuration** tabs are either saved automatically or must be saved manually. Sections of the web interface in which changes are saved automatically are enclosed by a green rectangle and include the word **Autosaved** next to the configuration section name.

**Example of Configuration Changes Automatically Saved**

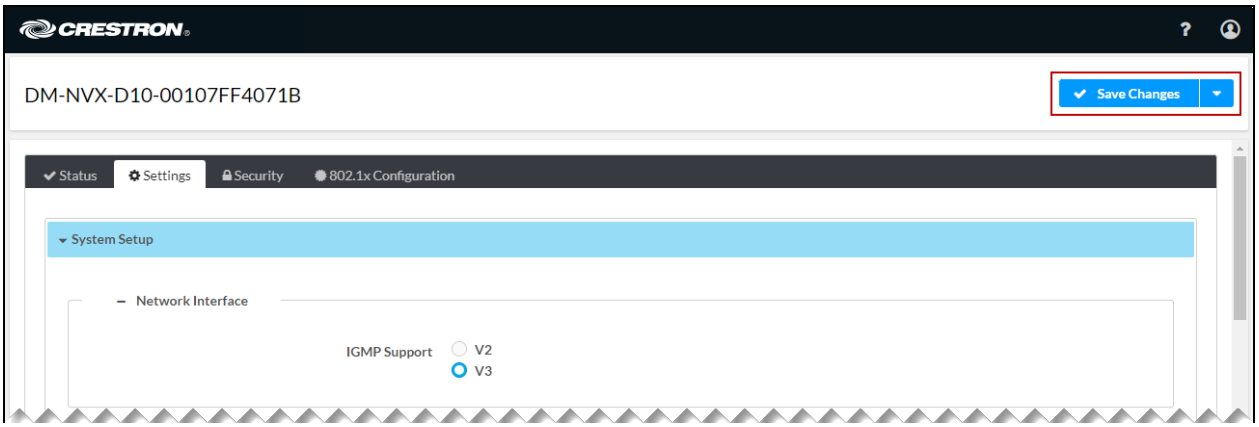

Settings that must be saved manually can be saved by using the **Action** menu of the web interface. By default, the **Action** menu provides **Save Changes** and **Revert** (undo) menu items that are disabled (grayed out) prior to configuration settings being changed.

**Action Menu - Save Changes and Revert Menu Items Disabled**



After one or more configuration settings are changed, the **Save Changes** menu item is enabled.

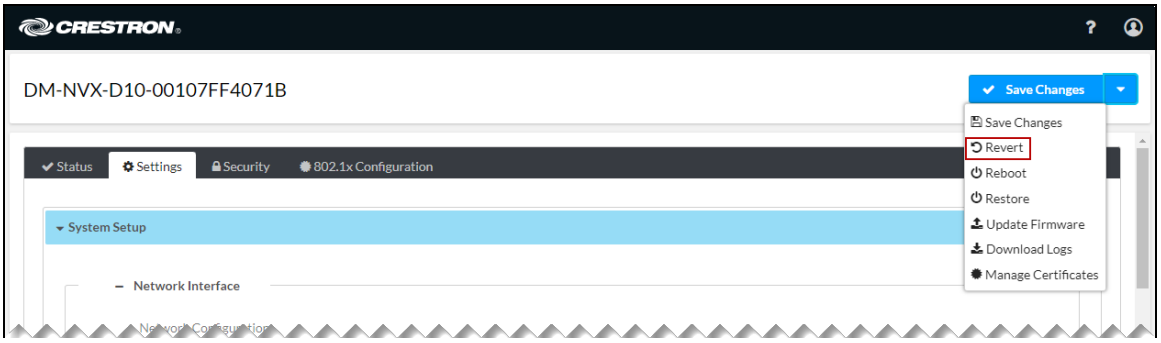
**Action Menu - Save Changes Menu Item Enabled**




Do either of the following:

- To save one or more configuration changes, click **Save Changes**.
- To undo the newly entered configuration changes and revert to the previously saved settings, click the drop-down arrow to the right of the **Save Changes** menu item and click **Revert**.

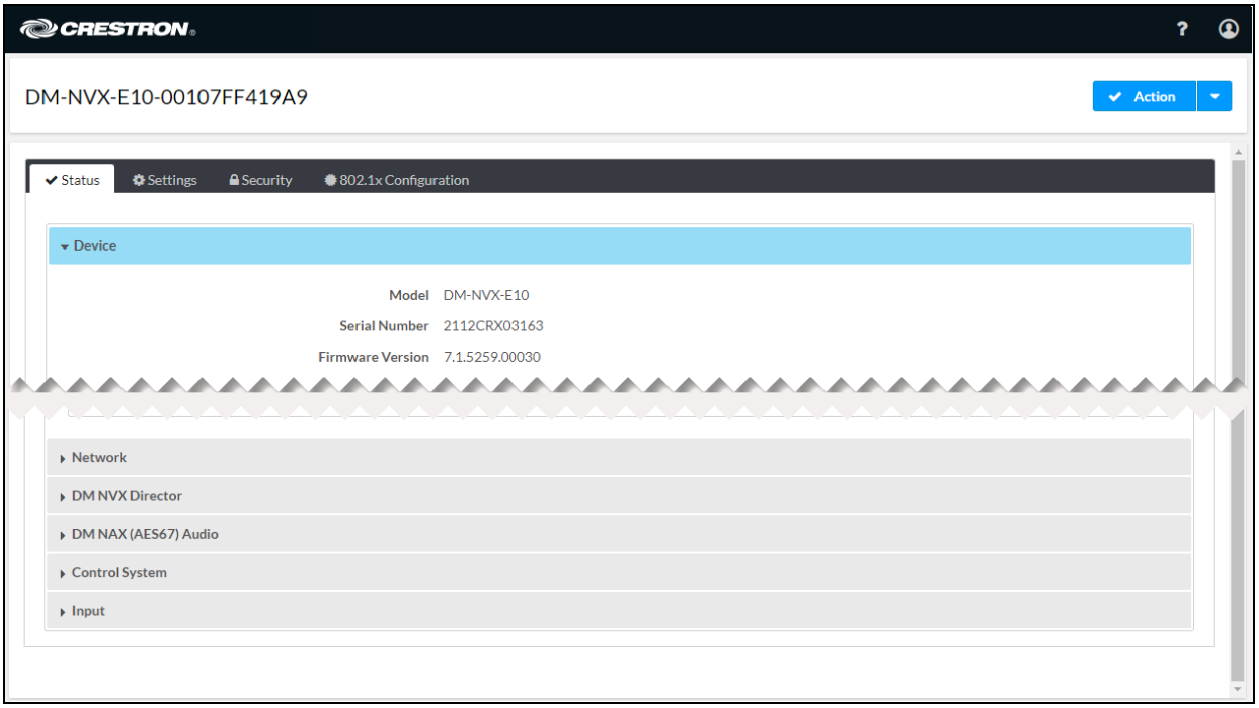
  **Action Menu - Revert Menu Item Enabled**



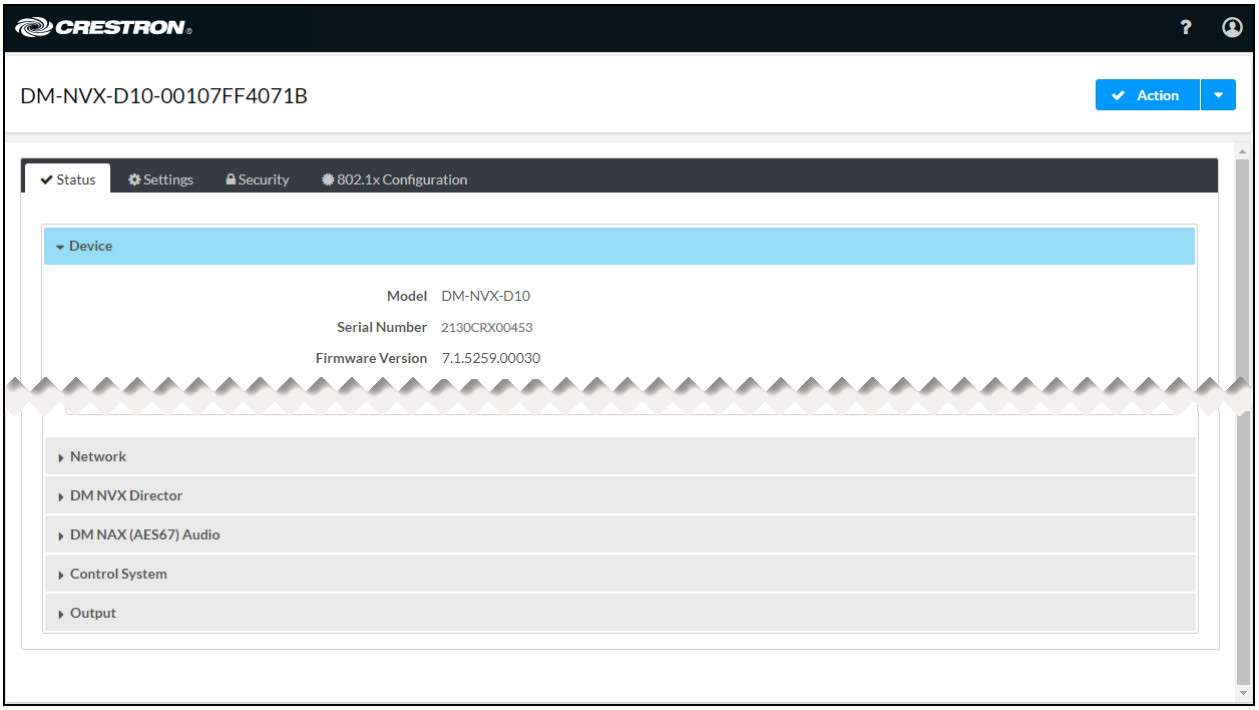
# Viewing Status Information

Click the **Status** tab to view information about the DM NVX device. By default, the **Status** tab is displayed after the web interface is accessed. The **Status** tab varies depending on whether the DM NVX device is an encoder or decoder.

### Status Tab for DM-NVX-E10



### Status Tab for DM-NVX-D10




The **Status** tab consists of the following sections:

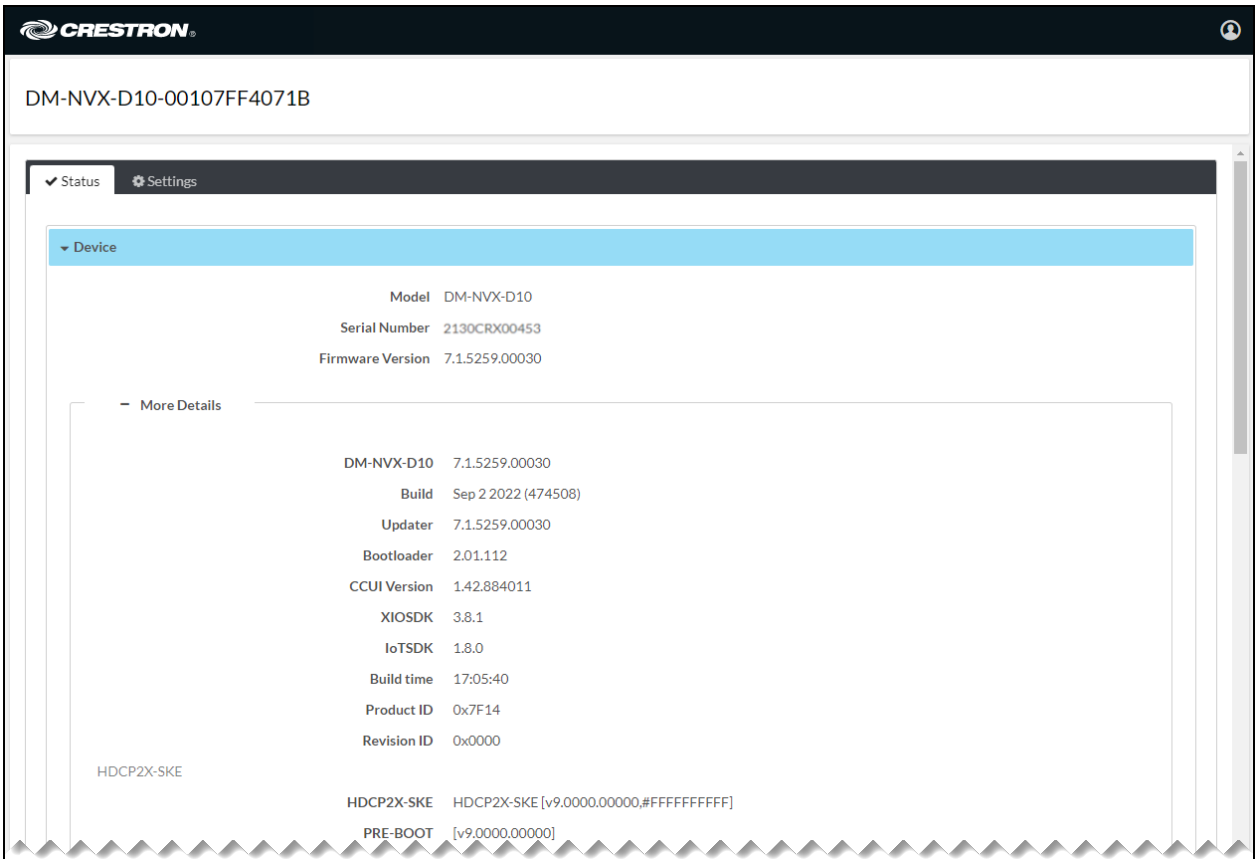
- Device
- Network
- DM NVX Director
- DM NAX (AES67) audio
- Control system
- Input (encoder only)
- Output (decoder only)

To open or close any section of the **Status** tab, click the corresponding section name.

# Device

By default, the **Device** section is displayed when the **Status** tab opens.

**Status Tab - Device (Sample DM-NVX-D10 Screen Shown)**



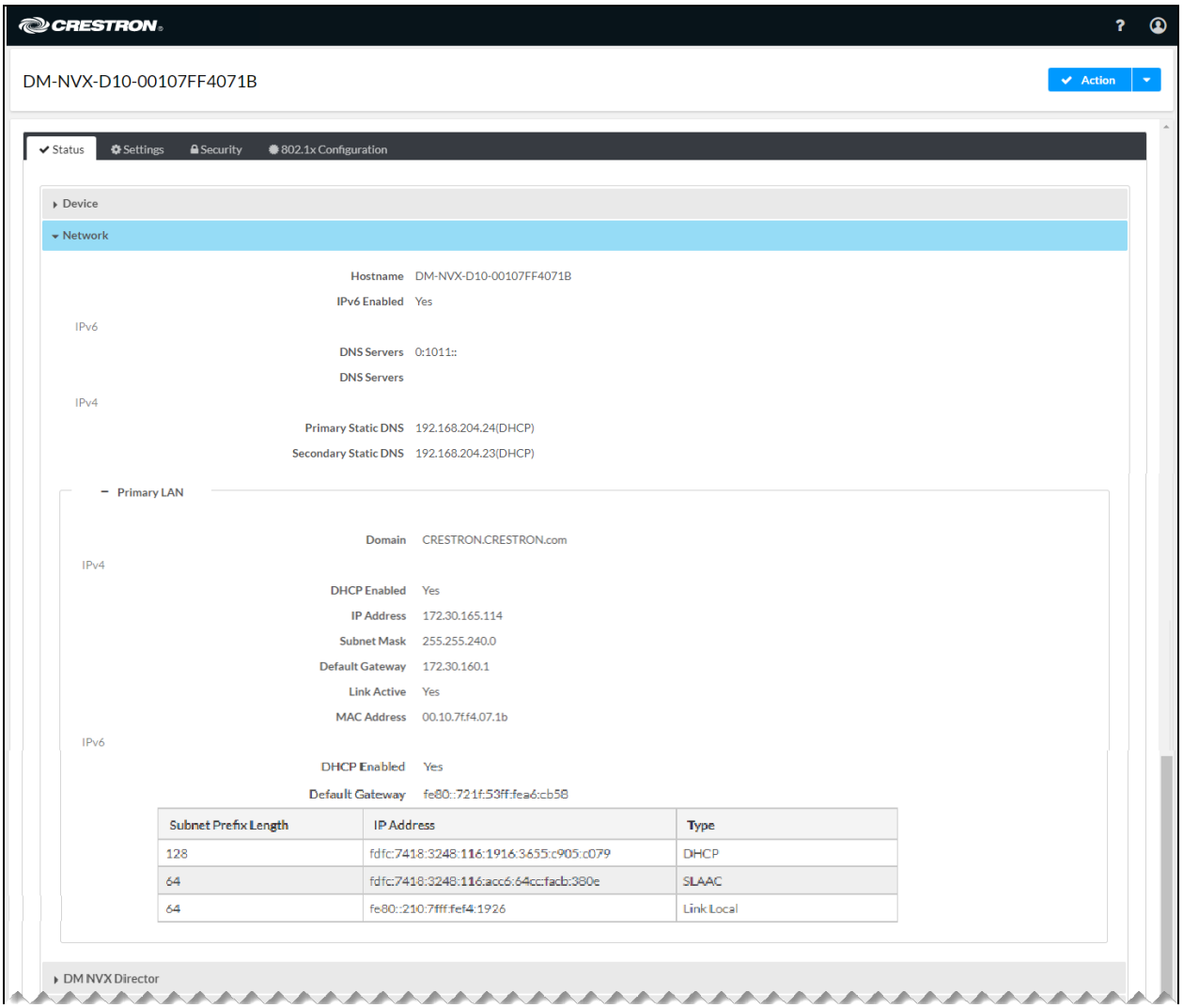

The **Device** section displays general information such as the model name, serial number, and firmware version of the device.

By default, the **More Details** section is open, displaying additional information about the device. To close the section, click **More Details**.

# Network

To view network-related information, open the **Network** section of the **Status** tab.

**Status Tab - Network (Sample DM-NVX-D10 Screen Shown with IPv6 Enabled)**




The **Network** section displays the hostname of the DM NVX device and indicates whether IPv6 is enabled (**Yes** or **No**). If IPv6 is enabled, the primary and secondary static DNS IP addresses are displayed. For IPv4, the primary and secondary static DNS IP addresses are also displayed.

By default, the **Primary LAN** section is open, displaying additional details about the network. Details include the domain name and information related to IPv4. If IPv6 is enabled, information related to IPv6 is also displayed.

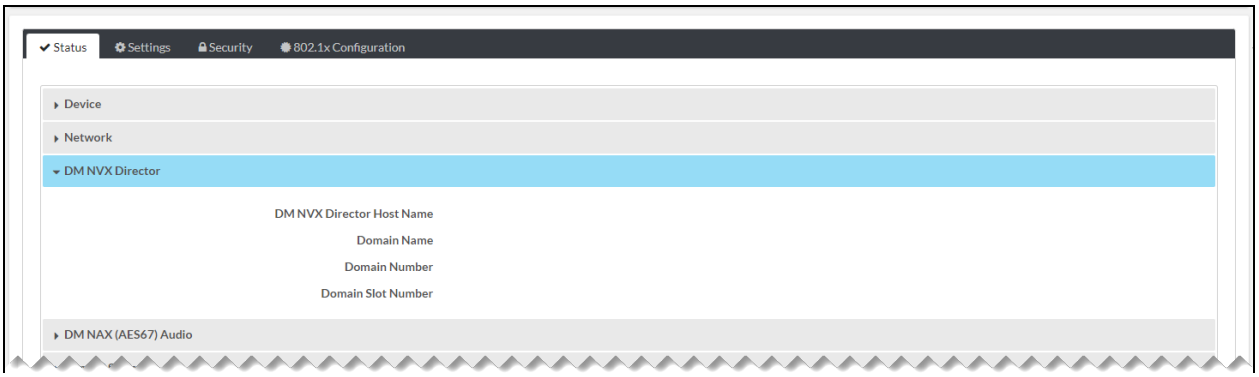
> **NOTE:** For IPv6 information related to DM NVX devices, refer to Online Help Answer ID 1001763.

To close the **Primary LAN** section, click **Primary LAN**.

# DM NVX Director Virtual Switching Appliance

To view information about the DM NVX Director® virtual switching appliance that is managing the DM NVX device, open the **DM NVX Director** section of the **Status** tab.

**Status Tab - DM NVX Director**

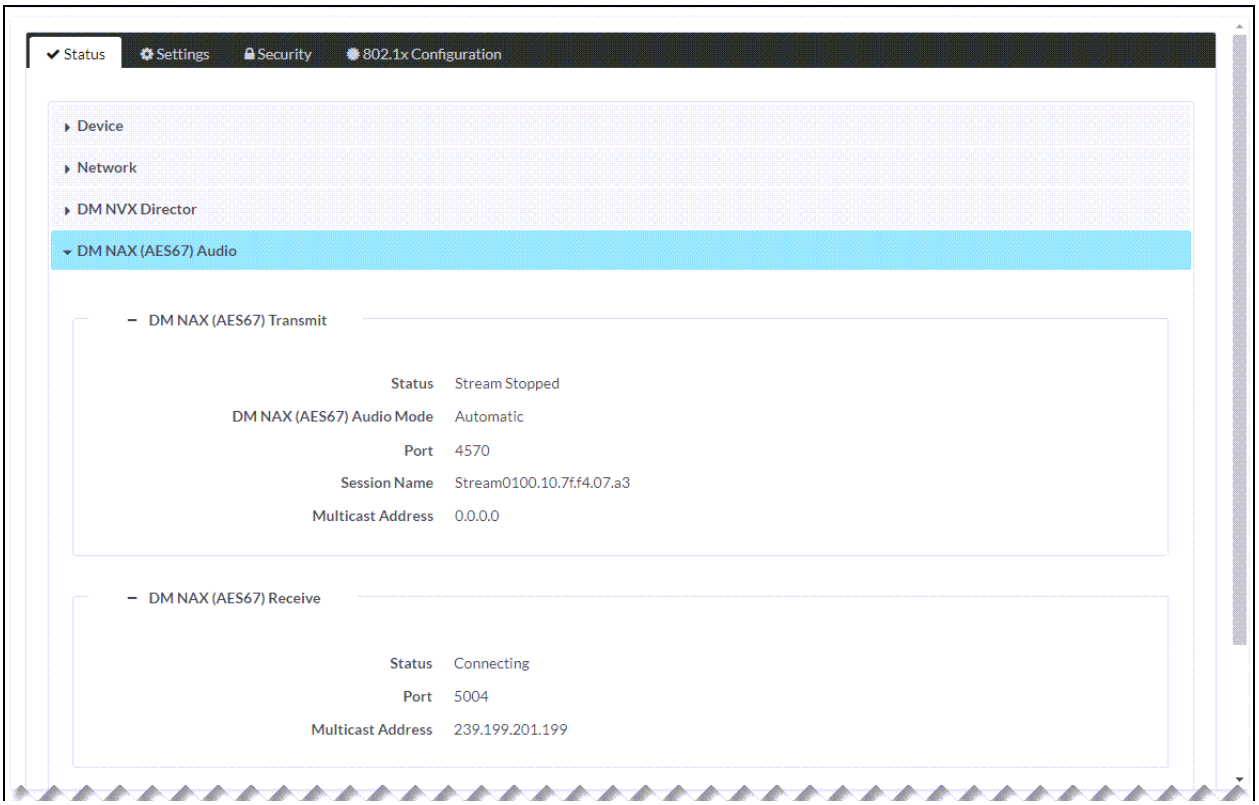



The **DM NVX Director** section displays the DM NVX Director host name, domain name, domain number, and domain slot number to which the DM NVX device is assigned.

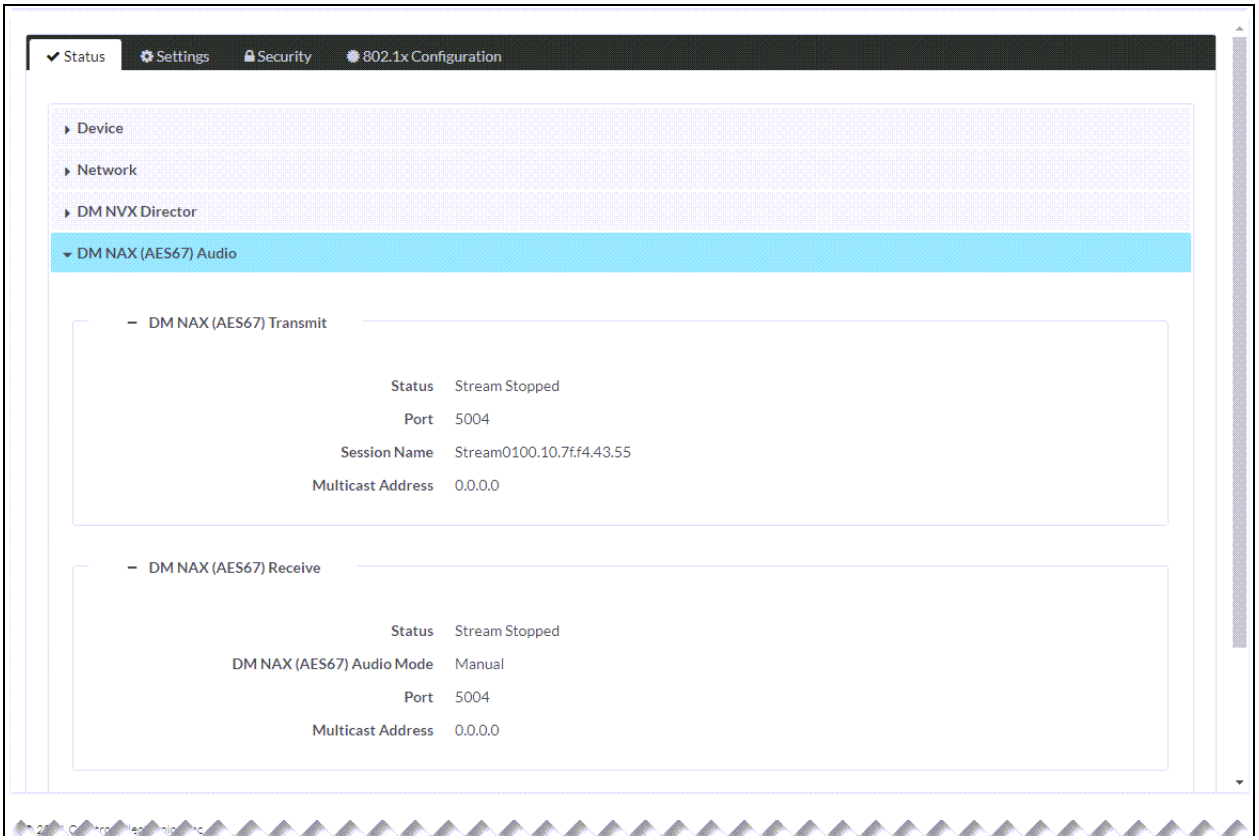
# DM NAX (AES67) Audio

To view information about DM NAX™ (AES67) audio, open the **DM NAX (AES67) Audio** section of the **Status** tab. The **DM NAX (AES67) Audio** section varies depending on whether the DM NVX device is an encoder or decoder.

**Status Tab - DM NAX (AES67) Audio for Encoder**



### Status Tab - DM NAX (AES67) Audio for Decoder

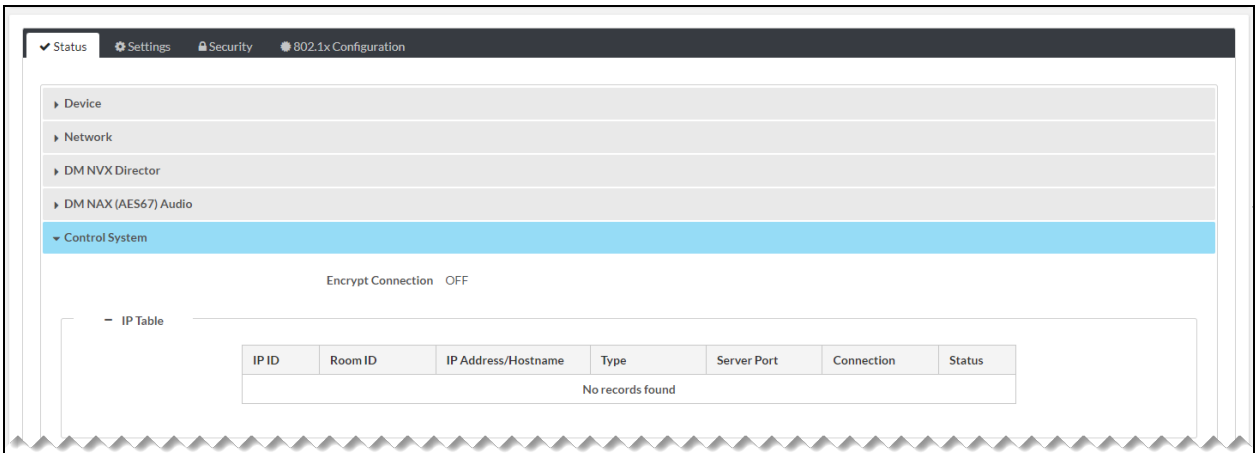



The **DM NAX (AES67) Audio** section displays information about the transmit and receive streams.

# Control System

To view control system information, open the **Control System** section of the **Status** tab.

**Status Tab - Control System**

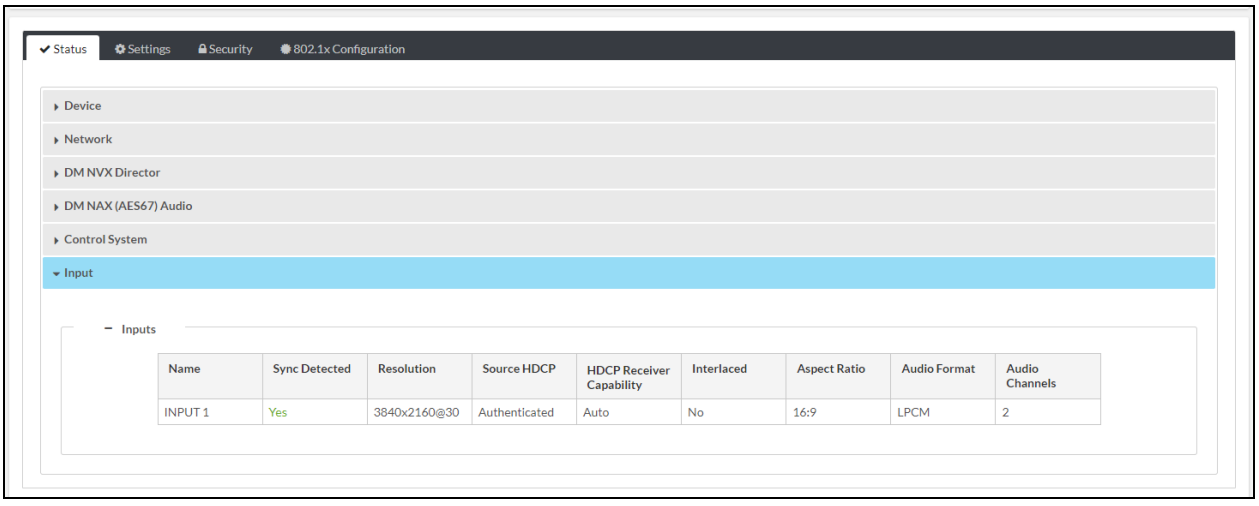



The **Control System** section displays information about whether the connection to the control system is encrypted and information about the IP table.

# Input (Encoder Only)

To view information about the HDMI input on the DM NVX encoder, open the **Input** section of the **Status** tab.

**Status Tab - Input (Encoder Only)**

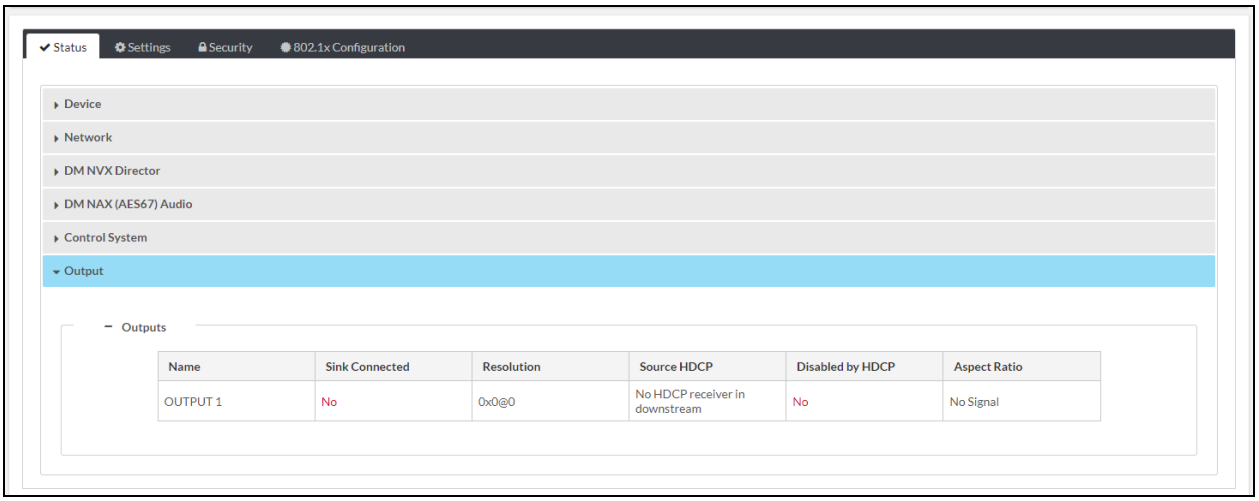



The **Input** section displays the input name and indicates whether a signal is detected at the input. Information about the video and audio input signal is also provided.

# Output (Decoder Only)

To view information about the HDMI output on the DM NVX decoder, open the **Output** section of the **Status** tab.

**Status Tab - Output (Decoder Only)**

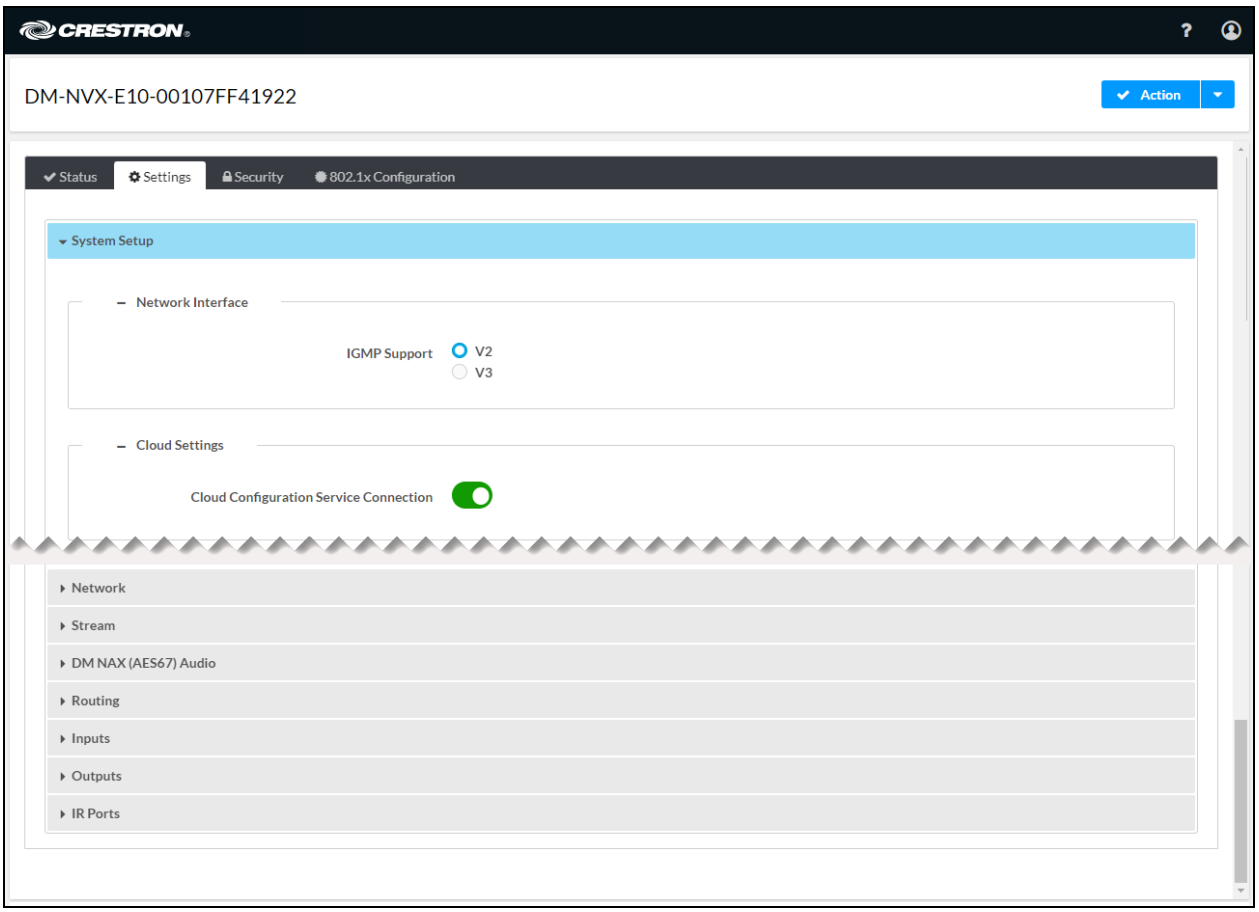



The **Output** section displays the output name and whether a sink (display device) is connected to the output. Information about the HDMI output signal is also provided.

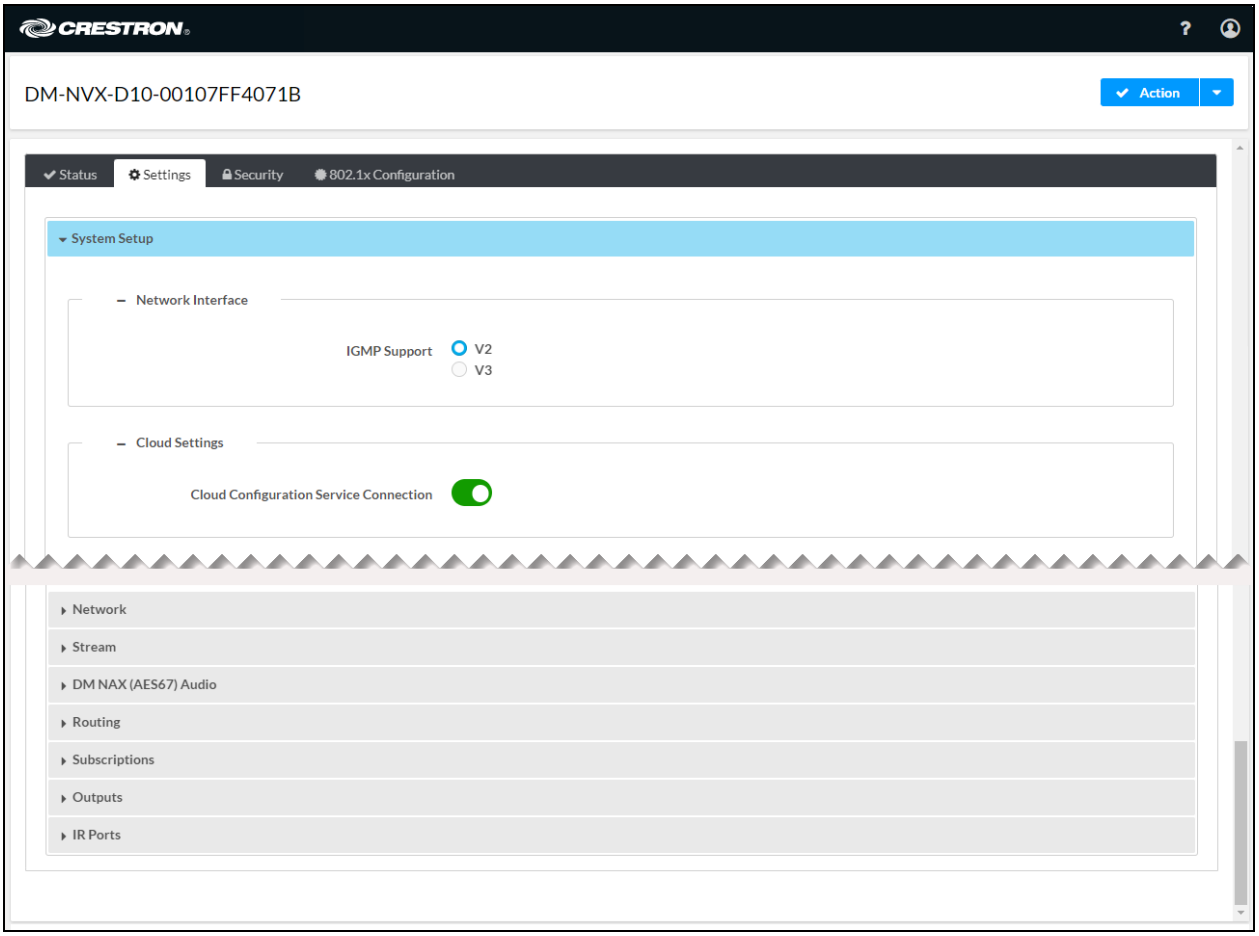
# Configuring Setup and Operational Settings

Click the **Settings** tab to configure setup and operational settings. The **Settings** tab varies depending on whether the DM NVX device is an encoder or decoder.

### Settings Tab for DM-NVX-E10



### Settings Tab for DM-NVX-D10




The **Settings** tab consists of the following sections:

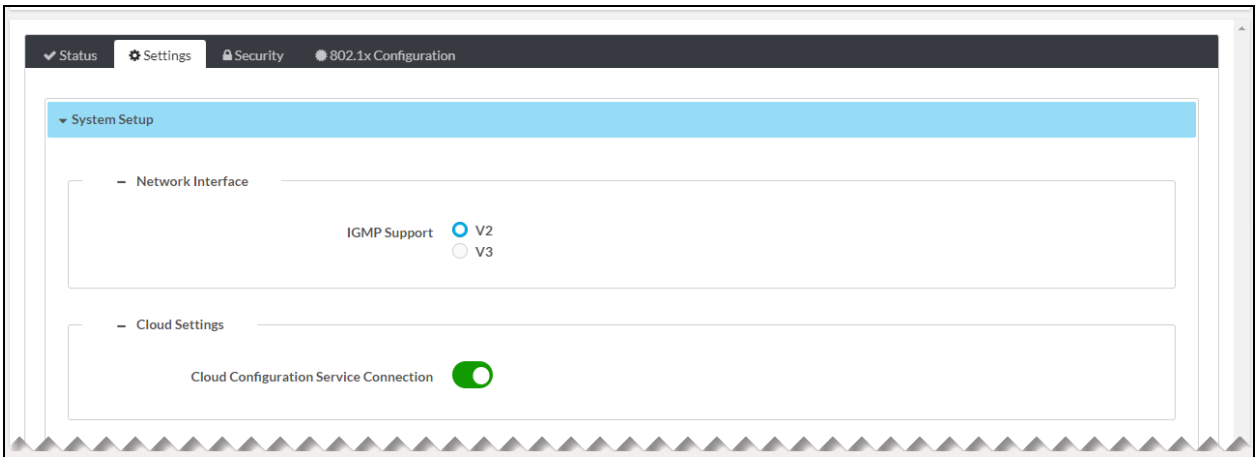
- System setup
- Network
- Stream
- DM NAX (AES67) audio
- Subscriptions (decoder only)
- Routing
- Inputs (encoder only)
- Outputs
- IR Ports

To open or close any section of the **Settings** tab, click the corresponding section name.

# System Setup

By default, the **System Setup** section is displayed when the **Settings** tab opens.

**Settings Tab, System Setup**




**System Setup** consists of the following sections:

- Network interface
- Cloud settings
- RS-232 port settings
- Auto update
- Date/time
- Discovery config
- Control system
- Point-to-point control

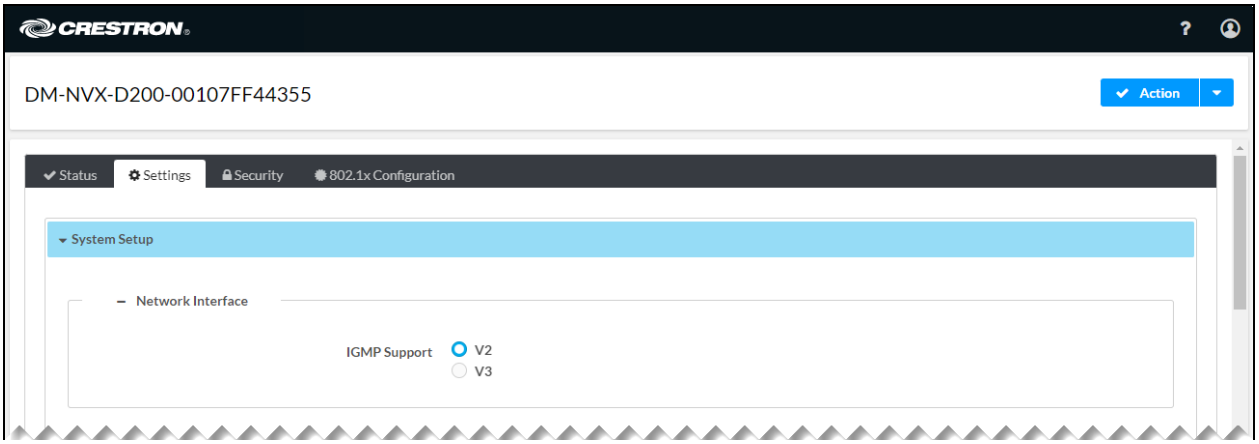
By default, the configuration items within each section are displayed. To close or reopen a section, click the section name.

## Network Interface

In the **Settings** tab, configure the IGMP version in the **Network Interface** section of **System Setup**.

> **NOTE:** For information about IGMP interoperability with DM NVX devices, refer to the Appendix.

Settings Tab - System Setup, Network Interface



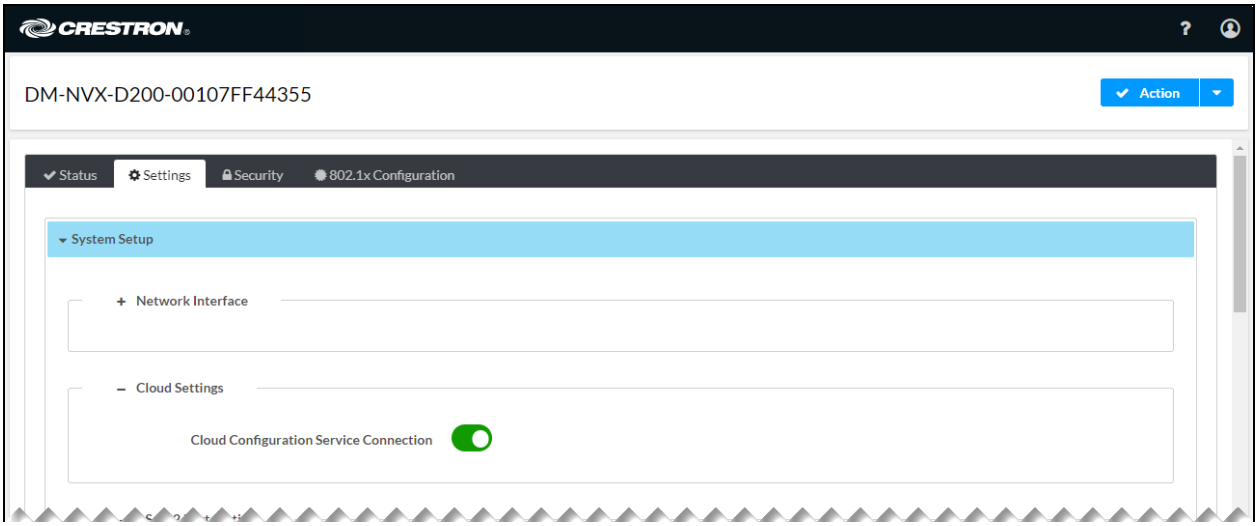

Select the desired **IGMP Support** version, **V2** or **V3**, by clicking the corresponding radio button. The default setting is **V2**.

> **NOTE:** When the IGMP version is changed, the DM NVX device must be rebooted in order for the change to take effect.

## Cloud Settings

In the **Settings** tab, enable or disable connection to the XiO Cloud® service in the **Cloud Settings** section of **System Setup**.

**Settings Tab - System Setup, Cloud Settings**



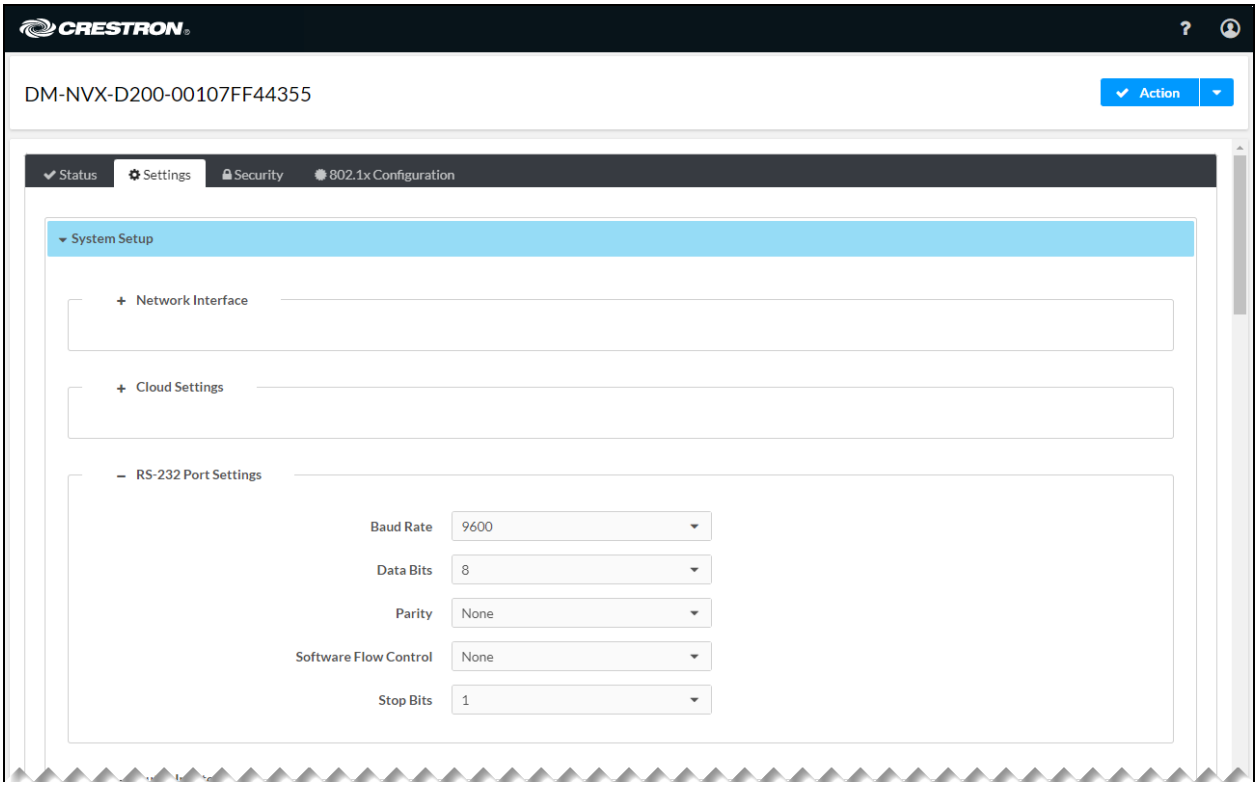

By default, the **Cloud Configuration Service Connection** toggle switch is in the On position, enabling connection to the XiO Cloud service. To disable the connection, set the toggle switch in the Off position.

> **NOTE:** For information about the XiO Cloud service, refer to the XiO Cloud Provisioning and Management Service User Guide.

## RS-232 Port Settings

In the **Settings** tab, configure RS-232 port settings in the **RS-232 Port Settings** section of **System Setup**.

**Settings Tab - System Setup, RS-232 Port Settings**




Refer to the configuration guidelines that follow.

- **Baud Rate:** In the drop-down list, select the desired baud rate in bits per second (bps). Available selections are:

  **600**
  **1200**
  **2400**
  **4800**
  **9600** (default setting)
  **14400**
  **19200**
  **38400**
  **57600**
  **115200**

- **Data Bits:** In the drop-down list, select the number of data bits: **7** or **8**. The default setting is **8**.
- **Parity:** In the drop-down list, select **None**, **Odd**, or **Even**. The default setting is **None**.

- **Software Flow Control:** In the drop-down list, select **None** or **XON/XOFF**. The default setting is **None**.
- **Stop Bits:** In the drop-down list, select **1** or **2**. The default setting is **1**.

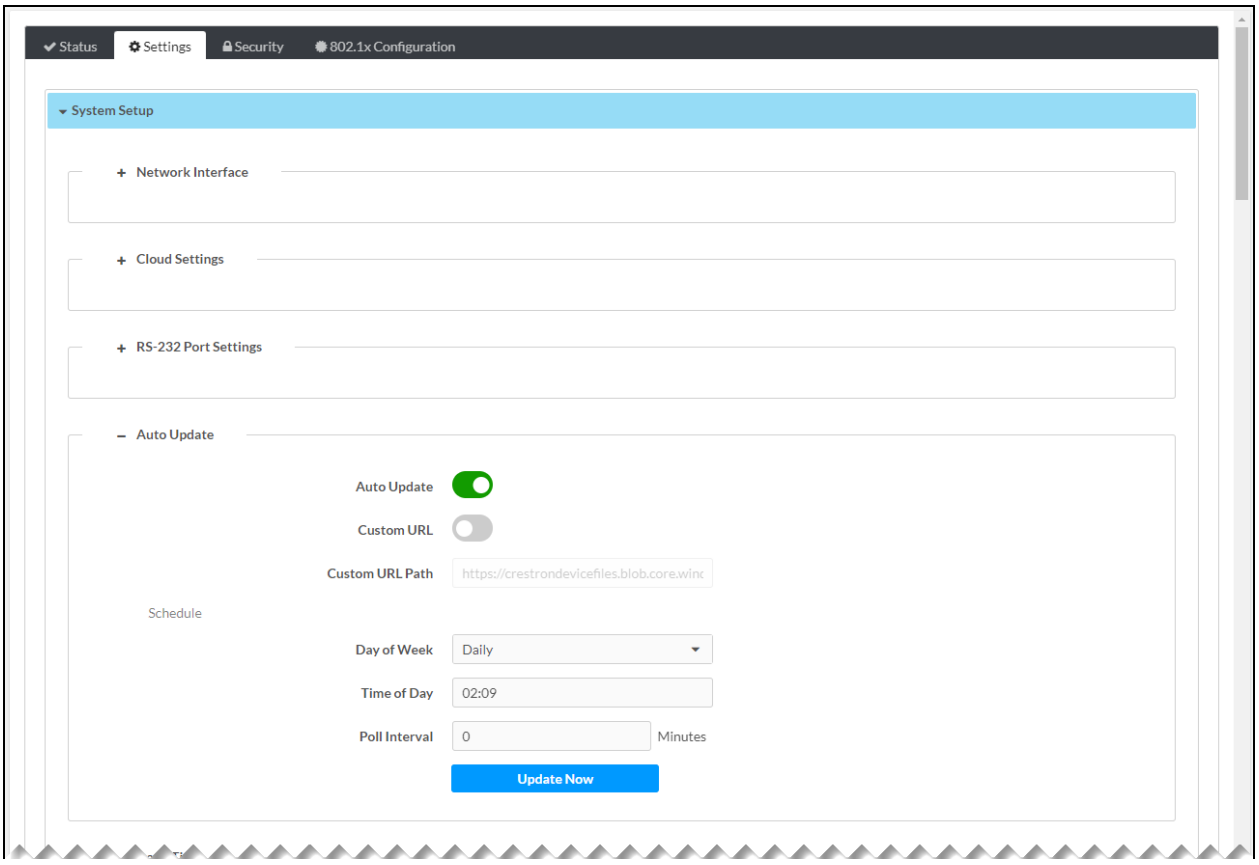
## Auto Update

A DM NVX device can be configured to be updated automatically with the latest firmware at scheduled intervals.

> **NOTE:** Before configuring automatic firmware update using the web interface, use the Crestron Auto Update tool to generate a manifest file (*.mft). The file is placed on an FTP or SFTP server and will be used in the automatic firmware update process.

In the **Settings** tab of the web interface, configure automatic firmware update in the **Auto Update** section of **System Setup**.

**Settings Tab - System Setup, Auto Update**




Refer to the configuration guidelines that follow.

- **Auto Update:** By default, **Auto Update** is enabled (the toggle switch is set in the On position). When enabled, automatic firmware update can be configured.

- **Custom URL:** By default, **Custom URL** is disabled (the toggle switch is set in the Off position). When disabled, the server URL will default to the standard Crestron update server.
- **Custom URL Path:** (Applicable when **Custom URL** is enabled) Enter the path to the manifest file in the following FTP or SFTP URL format:

  `ftp://username:password@host:port/path/filename`

  or

  `sftp://username:password@host:port/path/filename`

  where:

  - *username* is the username on the FTP or SFTP server
  - *password* is the password for the username
  - *host* is the fully qualified domain name or IP address of the FTP or SFTP server
  - *port* is the connection port on the host

    > **NOTE:** The default FTP port number is 21. The default SFTP port number is 22. Entry of a port number is necessary only if the port number differs from the default value of 21 or 22.

  - *path* is the path to the manifest file
  - *filename* consists of the name and extension (.mft) of the manifest file

**Schedule**

Set a schedule for the automatic firmware update by doing either of the following:

- Select the desired day and time:
  - **Day of Week:** In the drop-down list, select one of the following: **None**, **Daily**, **Sunday**, **Monday**, **Tuesday**, **Wednesday**, **Thursday**, **Friday**, or **Saturday**. The default setting is **Daily**.
  - **Time of Day:** Enter the desired time of day in 24-hour format.
- Set the **Poll Interval** at which the DM NVX device will poll the server for a firmware update. Enter a value from **60** to **65535** minutes The default setting is **0**, which disables the poll interval.

Clicking **Update Now** causes the firmware to be updated at the current time; however, the schedule that is set in the **Schedule** section remains in effect.

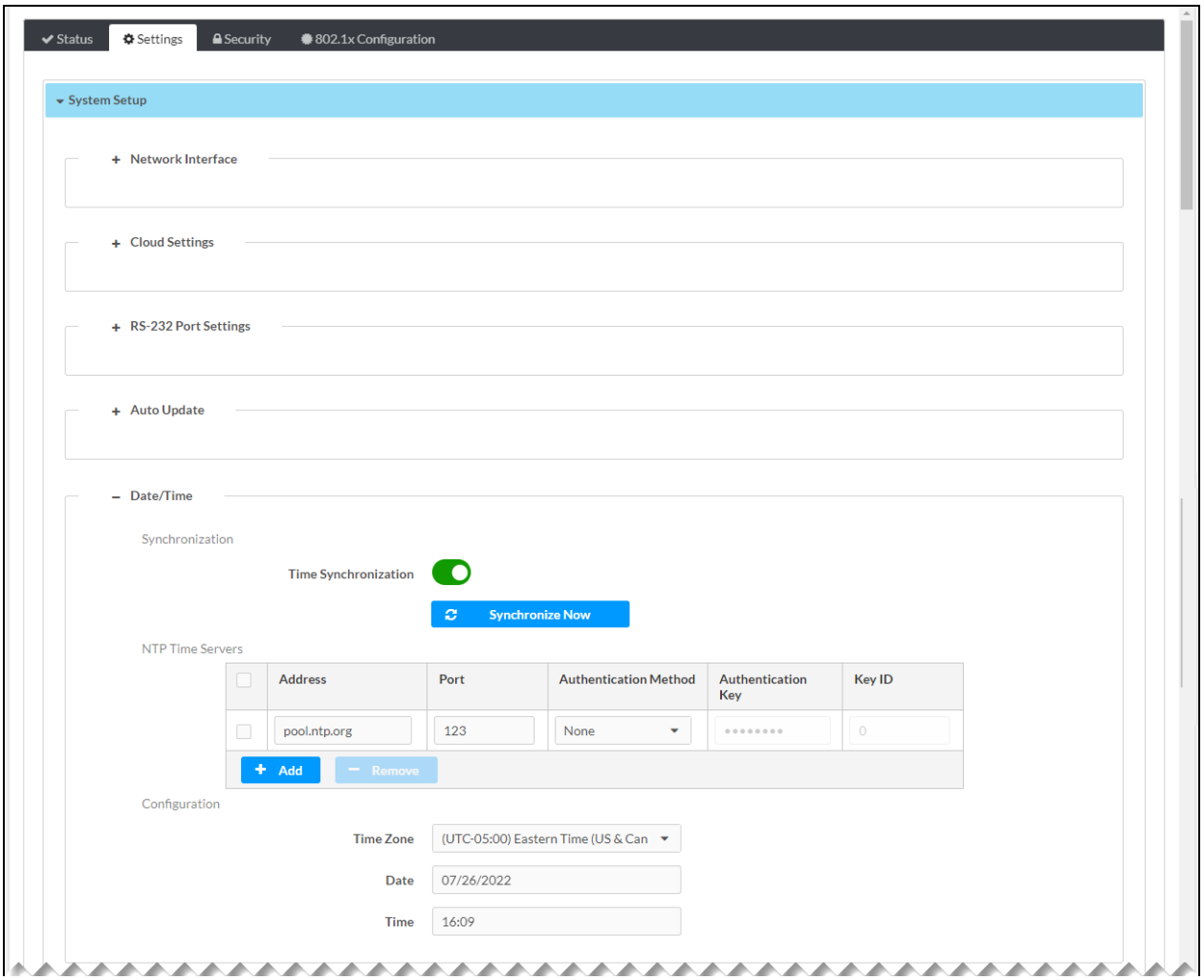
To disable automatic firmware update, set the **Auto Update** toggle switch in the Off position.

## Date/Time

A DM NVX device can be configured for date and time synchronization with up to three NTP (Network Time Protocol) servers.

In the **Settings** tab, configure date and time synchronization in the **Date/Time** section of **System Setup**.

**Settings Tab - System Setup, Date/Time**




Refer to the configuration guidelines that follow.

### Synchronization

**Time Synchronization:** By default, **Time Synchronization** is enabled (the toggle switch is set in the On position). To disable date and time synchronization with one or more NTP servers, set the **Time Synchronization** toggle switch in the Off position.

If **Time Synchronization** is enabled, click the **Synchronize Now** button after entering one or more NTP servers in the **NTP Time Servers** table and configuring time and date information in the **Configuration** section below the table.

### NTP Time Servers

(Applicable when **Time Synchronization** is enabled) In the **NTP Time Servers** table, assign NTP servers. The default NTP server is **pool.ntp.org** with a port number of **123** and no authentication method (**None**). The default NTP server can be changed if desired as discussed below.

To add additional servers, click the **Add** button. Up to three NTP servers are supported: one primary server and two secondary servers.

For each NTP server that is added, assign the following settings:

- **Address:** In the text box, enter the IP address or hostname of the NTP server. The default NTP server address of **pool.ntp.org** can be used or changed if desired.
- **Port:** In the text box, enter the port number of the NTP server. The default NTP server, **pool.ntp.org**, is assigned port **123**, which can be used or changed if desired.
- **Authentication Method:** In the drop-down list, select **None**, **SHA1**, or **SHA256**. The setting of **SHA1** or **SHA256** provides secure NTP MAC authentication. The default NTP server, **pool.ntp.org**, is assigned **None**, which can be used or changed if desired.
- **Authentication Key:** (Applicable when **SHA1** or **SHA256** is assigned as the authentication method) In the text box, enter the pre-shared key between the DM NVX device (NTP client) and the NTP server.
- **Key ID:** (Applicable when **SHA1** or **SHA256** is assigned as the authentication method) In the text box, enter the pre-shared key index between the DM NVX device (NTP client) and the NTP server. Valid values range from **1** to **65535**.

To delete an NTP server, select the corresponding check box and click the **Remove** button. To select and delete all NTP servers listed in the table, select the check box in the topmost row of the first column and click the **Remove** button.

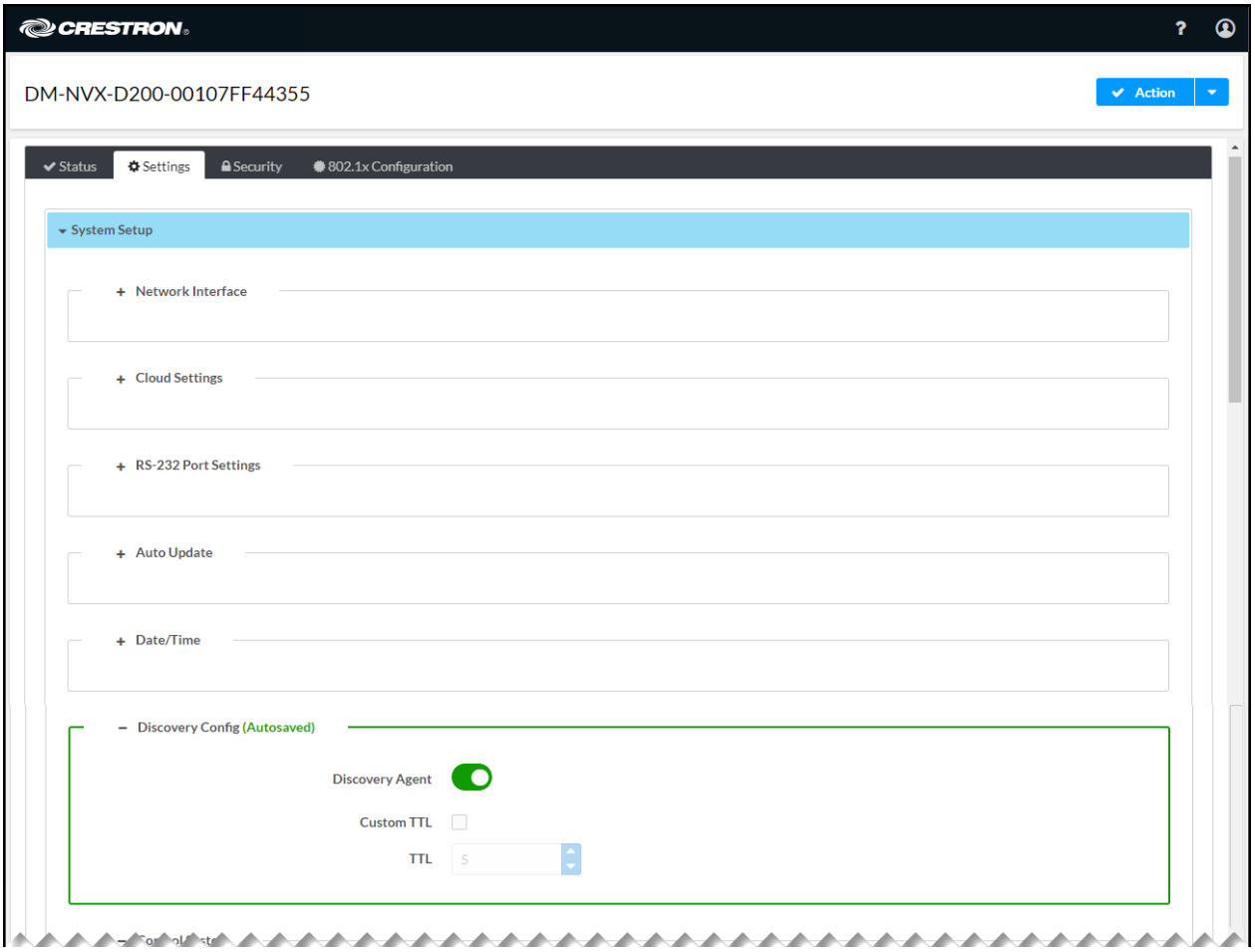
### Configuration

- **Time Zone:** In the drop-down list, select the applicable time zone. The default setting is **(UTC - 05:00) Eastern Time (US & Canada)**.
- **Date:** In the **Date** pop-up dialog box, select the current month, year, and day.
- **Time:** In the **Time** pop-up scroll box, enter the current time in 24-hour format.

## Discovery Config

In the **Settings** tab, configure device discovery parameters in the **Discovery Config** section of **System Setup**.

**Settings Tab - System Setup, Discovery Config**




Refer to the configuration guidelines that follow.

> **NOTE:** When changes are made to the **Discovery Config** section, the changes are automatically saved.

- **Discovery Agent:** By default, **Discovery Agent** is enabled (the toggle switch is set in the On position). When enabled, DM NVX encoders can be discovered for subscription to a decoder in order to stream video and audio. The encoders are listed in the **Available Streams** list in the Subscriptions section of the **Settings** tab.

  To disable **Discovery Agent** for reasons such as security, set the toggle switch in the Off position.

- **Custom TTL:** Multicast TTL provides the ability to limit or extend the hop limit of a DM NVX stream that traverses routers. In IPv4 multicasting, routers have a TTL threshold assigned to each interface. Only multicast packets with a TTL greater than the threshold of the interface are forwarded.

  The default multicast TTL setting is **5**. To assign a different value:

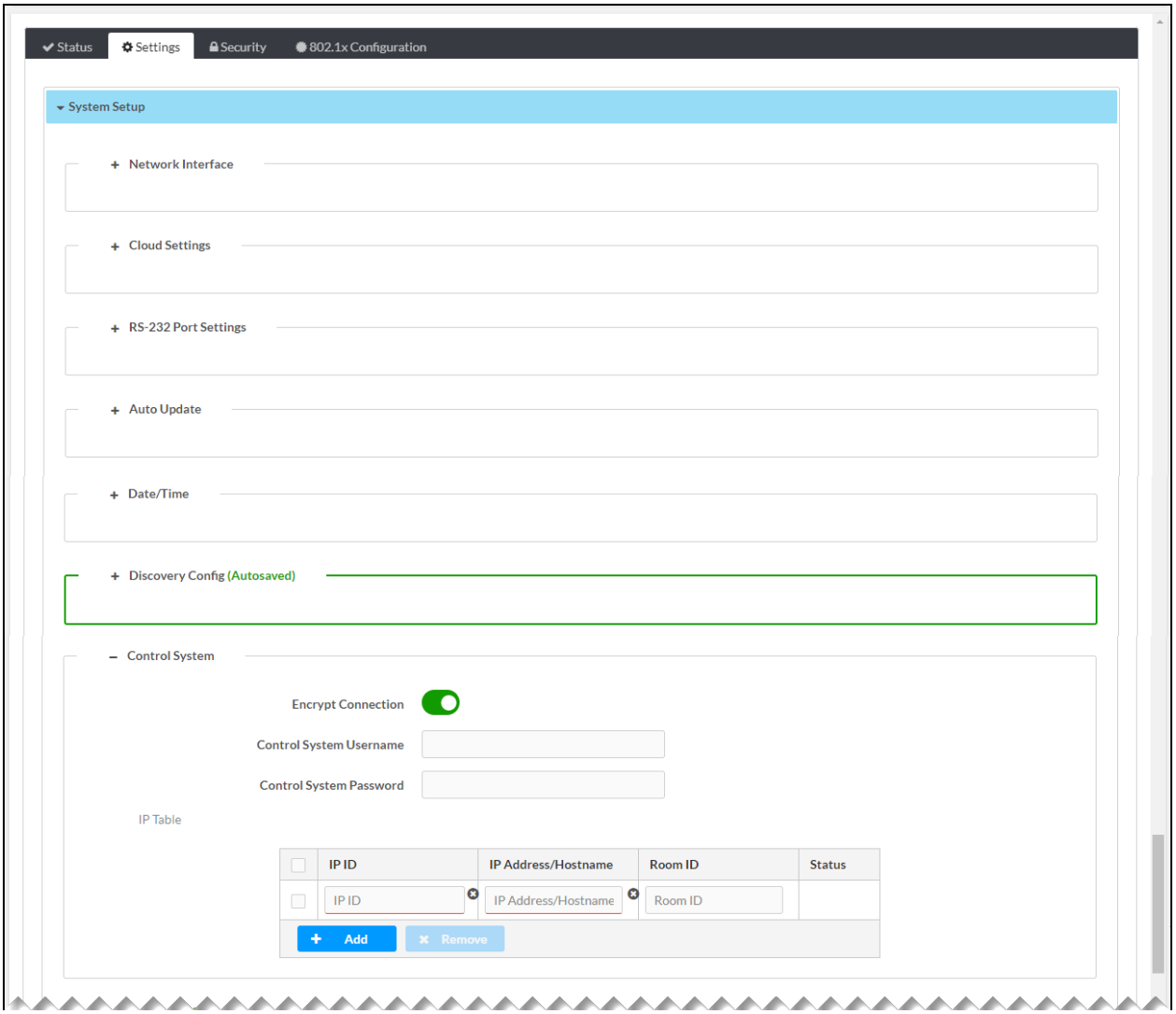
  1. Select the **Custom TTL** check box.
  2. In the **TTL** scrollable text box, enter or select the desired value. Valid values range from **1** to **255**.

  > **NOTE:** Deselecting the **Custom TTL** check box returns the TTL value to **5**, which is the default setting.

## Control System

In the **Settings** tab, configure connection to up to 16 control systems in the **Control System** section of **System Setup**.

**Settings Tab - System Setup, Control System**




Refer to the configuration guidelines that follow.

- **Encrypt Connection:** By default, **Encrypt Connection** is disabled (the toggle switch is in the Off position). To enable an encrypted connection between the control system and the DM NVX device, set the toggle switch in the On position.
- **Control System Username:** (Applicable when **Encrypt Connection** is enabled) Enter a username that is to be used to sign in to the control system.
- **Control System Password:** (Applicable when **Encrypt Connection** is enabled) Enter a password that is to be used to sign in to the control system.

### IP Table

In the IP table, add up to 16 control systems by doing the following:

1. Click the **Add** button.
2. Assign the following settings:
    - **IP ID:** In the text box, enter the IP ID of the DM NVX device. Valid values range from **03** to **FE** in hexadecimal notation.
    - **IP Address/Hostname:** In the text box, enter the IP address or hostname of the control system.
    - **Room ID:** (Optional) Enter the room ID.

    **Status** indicates whether the control system is **ONLINE** or **OFFLINE**.

> **NOTE:** To delete a control system listed in the table, select the corresponding check box and click the **Remove** button. To select and delete all control systems, select the topmost check box in the first column of the table and click the **Remove** button.

## Point-to-Point Control

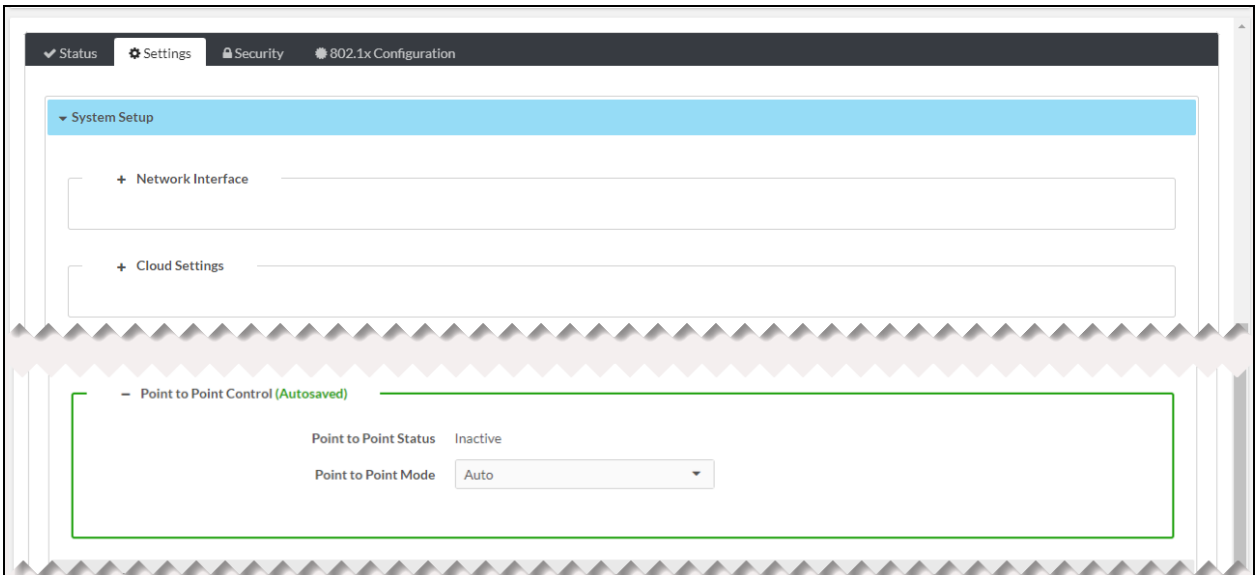
Point-to-point control specifies whether a point-to-point connection between a DM NVX encoder and DM NVX decoder is to be automatically detected. In addition, the status of the point-to-point connection can be viewed.

**NOTES:**

- The DM-NVX-E10 can be connected to a DM-NVX-D10, DM-NVX-D20, or DM-NVX-D200 for automatic point-to-point connectivity.
- The DM-NVX-D10 can be connected to a DM-NVX-E10 for automatic point-to-point connectivity.

In the **Settings** tab, configure point-to-point control or view the point-to-point status in the **Point-to-Point Control** section of **System Setup**.

**Settings Tab - System Setup, Point-to-Point Control**




Refer to the configuration guidelines that follow.

- **Point-to-Point Status:** Indicates the status of point-to-point connectivity between a DM NVX encoder and DM NVX decoder as **Active** or **Inactive**.
- **Point-to-Point Mode:** In the drop-down list, select either of the following:
  - **Auto:** (Default setting) A 1000BASE-T port of a DM NVX encoder detects a direct connection to a DM NVX decoder or a connection to a 1000BASE-T switch. Similarly, a 1000BASE-T port of a DM NVX decoder detects a direct connection to a DM NVX encoder or a connection to a 1000BASE-T switch. If a direct connection between an encoder and decoder is detected, point-to-point mode is automatically enabled.

    When point-to-point mode is enabled, no additional configuration is required for the

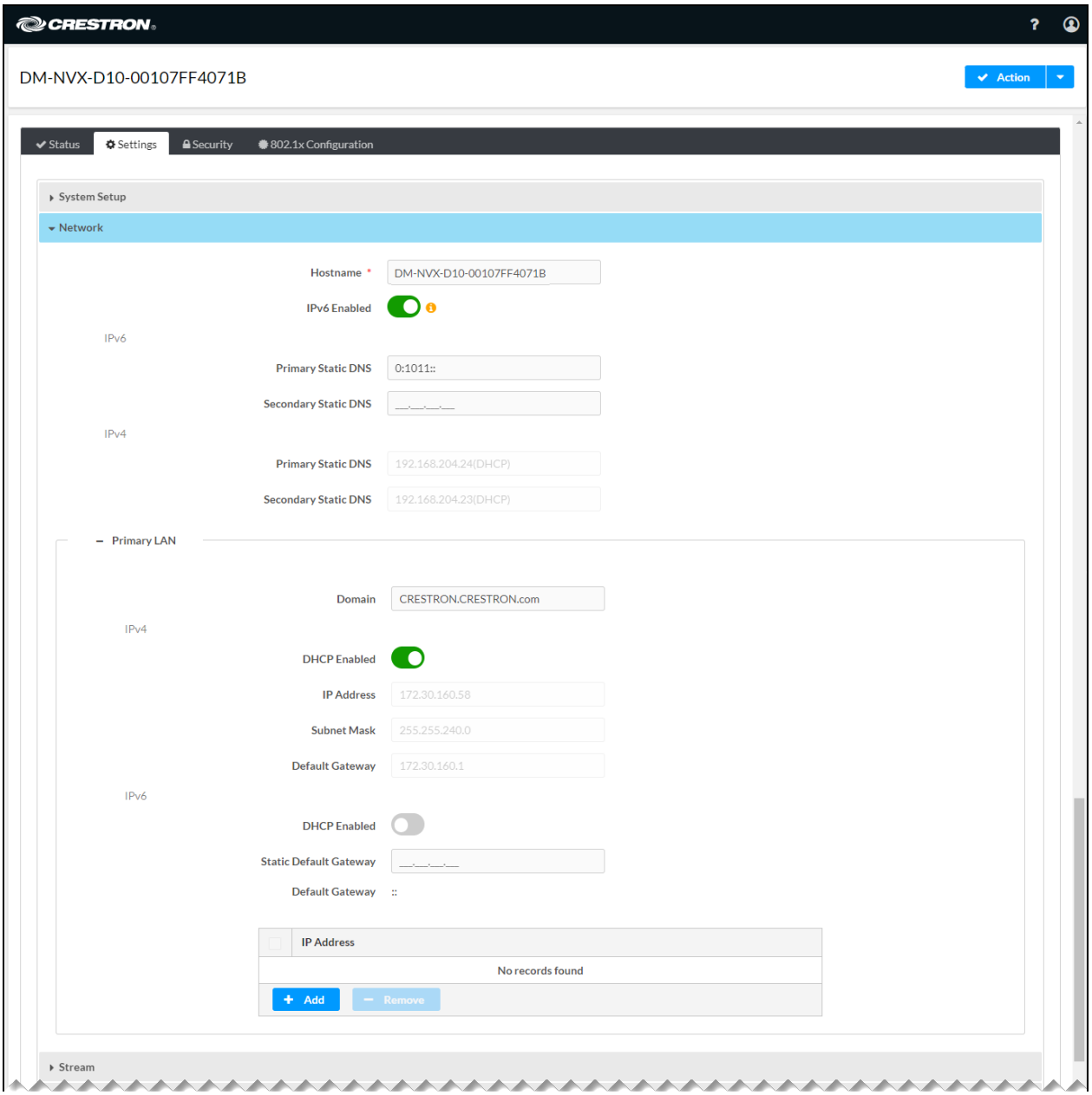
encoder or decoder to operate in point-to-point mode.

- **Disable:** Disables point-to-point mode

# Network

To configure network settings, open the **Network** section of the **Settings** tab.

**Settings Tab - Network (Sample DM-NVX-D10 Screen Shown)**




Refer to the configuration guidelines that follow.

- **Hostname:** Specifies the hostname that identifies the DM NVX device on the network. The hostname is restricted to the letters **a** to **z** (not case sensitive), the digits **0** to **9**, and the hyphen.

  The default hostname consists of the model name followed by a hyphen and the MAC address of the device. For example, if the model name is DM-NVX-D10 and the MAC address is 00.10.7f.f4.07.1b, the default hostname is **DM-NVX-D10-00107FF4071B**.
- **IPv6 Enabled:** By default, IPv6 is disabled (the toggle switch is set in the Off position). To enable IPv6, set the toggle switch in the On position.

  > NOTES:
  > - Enabling or disabling IPv6 requires a reboot of the DM NVX device in order for the change to take effect.
  > - IPv6 must be enabled in order for an IPv6 address to provide access to the DM NVX web interface.
  > - IPv4 is automatically enabled. If IPv6 is enabled, both IPv4 and IPv6 can be used simultaneously.
  > - For additional IPv6 information related to DM NVX devices, refer to Online Help Answer ID 1001763.

- **IPv6:** (Applicable when IPv6 is enabled) Enter the following:
  - **Primary Static DNS:** Specifies the IPv6 address of the primary static DNS server.
  - **Secondary Static DNS:** Specifies the IPv6 address of the secondary static DNS server.
- **IPv4:** (Applicable when DHCP is disabled for IPv4) Enter the following:
  - **Primary Static DNS:** Specifies the IPv4 address of the primary static DNS server.
  - **Secondary Static DNS:** Specifies the IPv4 address of the secondary static DNS server.

In the **Primary LAN** section, configure network settings for IPv4 and also for IPv6 if enabled.

- **Domain:** Specifies a domain name for the DM NVX device web interface.
- For **IPv4**, configure the following:
  - **DHCP Enabled:** By default, DHCP is enabled (the toggle switch is set in the On position).

    When DHCP is enabled, the IPv4 address of the DM NVX device is assigned by a DHCP server on the network for a predetermined period of time.

    > **NOTE:** If a DHCP server does not exist on the network, the IPv4 address defaults to a link-local address in the 169.254.*xxx.xxx* range (refer to RFC 3927 for detailed information about link-local addressing).

    To disable DHCP, set the toggle switch in the Off position.

> **NOTE:** Disabling or enabling DHCP requires a reboot of the device in order for the change to take effect.

- **IP Address:** (Applicable when **DHCP Enabled** is disabled) Enter a unique static IPv4 address for the DM NVX device.
- **Subnet Mask:** (Applicable when **DHCP Enabled** is disabled) Enter the IPv4 subnet mask that is set on the network.
- **Default Gateway:** (Applicable when **DHCP Enabled** is disabled) Enter the IPv4 address that is to be used as the default gateway.

- If **IPv6** is enabled, configure the following:
  - **DHCP Enabled:** By default, DHCP is enabled (the toggle switch is set in the On position).

    When DHCP is enabled, the IPv6 address of the DM NVX device is assigned by a DHCP server on the network for a predetermined period of time.

    > **NOTE:** Unlike IPv4, an IPv6 link-local address is always active regardless of whether a DHCP server exists on the network. The IPv6 link-local address is based on the MAC address of the device; therefore, the address is unique and does not change.

    To disable DHCP, set the toggle switch in the Off position.

    > **NOTE:** Disabling or enabling DHCP requires a reboot of the device in order for the change to take effect.

  - **Static Default Gateway:** (Applicable when **DHCP Enabled** is disabled) Enter the static IPv6 address that is to be used as the default gateway.
  - **Default Gateway:** (Applicable when **DHCP Enabled** is enabled) Displays the default gateway IPv6 address received from the DHCP server.
  - In the **IP Address** table, enter up to 10 static IPv6 addresses. For each IPv6 address, do the following:

    Click the **Add** button, and then enter the IPv6 address in the **IP Address** text box of the row. The **Copy** ( ) icon following the address can be used to automatically copy the address on an as-needed basis.

    A slash (/) follows the **Copy** icon. The slash indicates slash notation, also referred to as CIDR (Classless Inter-Domain Routing) notation. For an IPv6 network, slash notation represents the network identifier prefix. The prefix is expressed as a slash followed by the prefix size.

    In the scrollable text box following the slash, enter or select the prefix size, which is a decimal number ranging from **1** to **128**.

  To remove one or more IPv6 addresses from the table, select the check box to the left of the IPv6 addresses and then click the **Remove** button. To remove all IPv6 addresses from

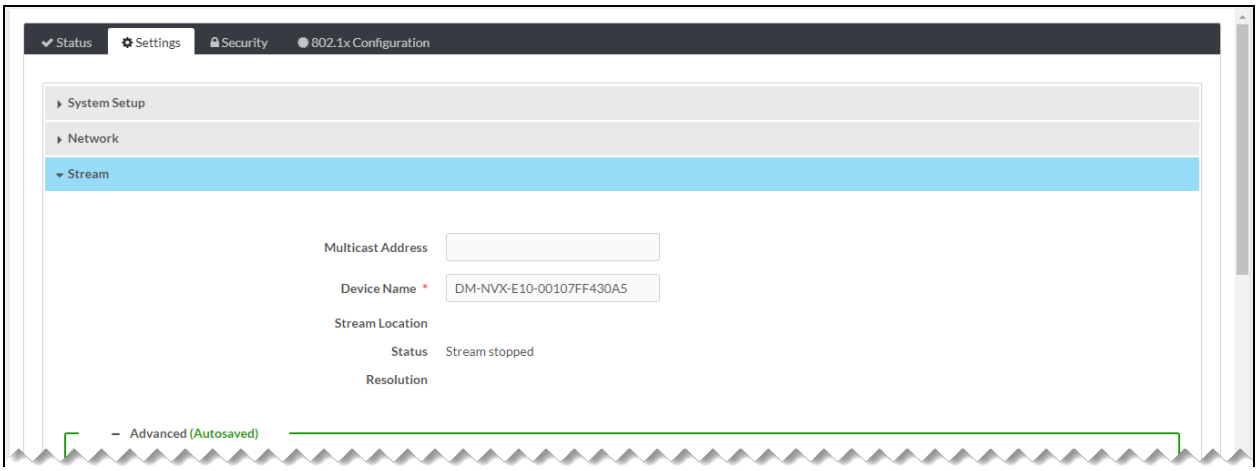
the table, select the topmost check box to the left of the **IP Address** heading of the table. All check boxes for all IPv6 addresses are automatically selected. Click **Remove**.

# Stream

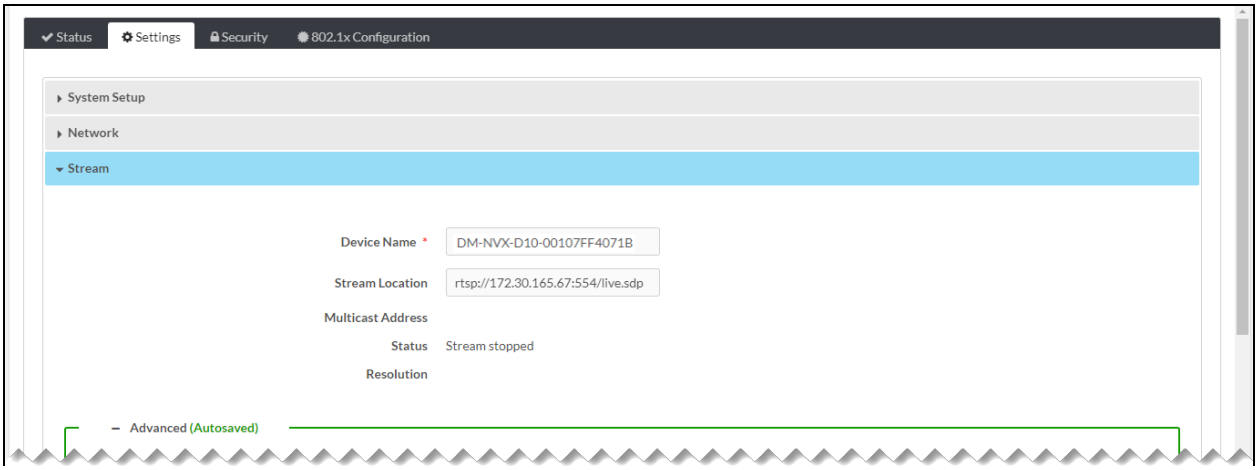
To configure stream settings, open the **Stream** section of the **Settings** tab.

The **Stream** section varies depending on whether the DM NVX device is an encoder or decoder.

**Settings Tab - Stream (Encoder Shown)**




**Settings Tab - Stream (Decoder Shown)**




Refer to the configuration guidelines that follow.

- **Multicast Address:** (Encoder only) Enter the primary multicast IP address for IPv4 or IPv6.

  For IPv4, use an even-numbered IP address ranging between 224.0.2.0 and 239.255.255.254 excluding 239.255.255.250. The stream is sent to this multicast address.

  For IPv6, refer to the following table for IPv6 multicast address scopes and the associated ranges for multicast addresses.

  **IPv6 Multicast Address Scopes and Associated Multicast Ranges**

| Multicast Address Scope | Associated Multicast Ranges |
|---|---|
| Link-Local scope | FF12, FF32, FF52, FF72 |
| Admin-Local scope | FF14, FF34, FF54, FF74 |
| Site-Local scope | FF15, FF35, FF55, FF75 |
| Organization-Local scope | FF18, FF38, FF58, FF78 |
| Global scope | FF1E, FF3E, FF5E, FF7E |

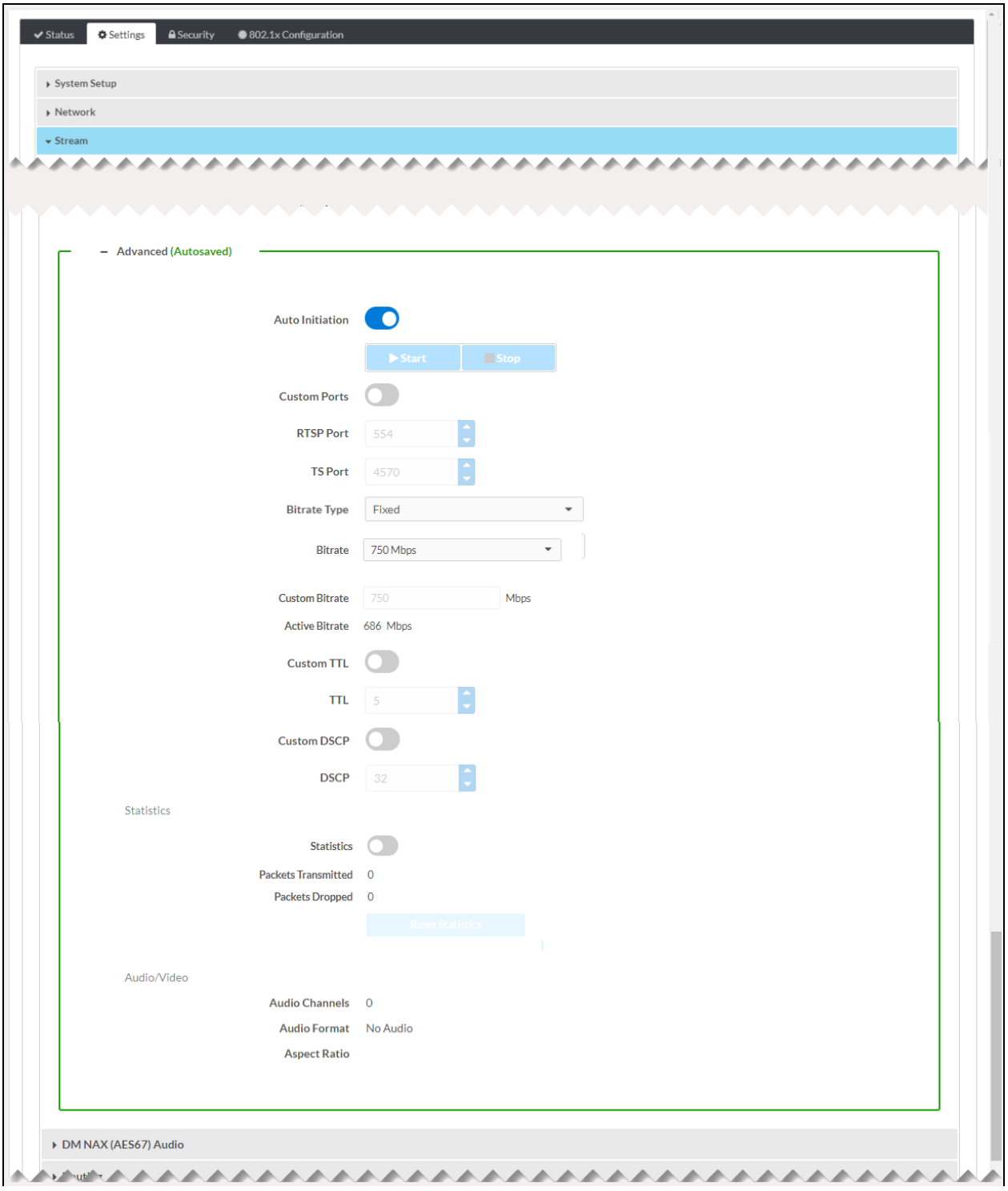
  > **NOTE:** IPv6 multicast addresses that do not correspond to the ranges listed in the table above will result in an **Invalid Multicast Address** error message.

- **Device Name:** Enter a name for the DM NVX device. By default, the device name is the model name followed by a hyphen and the MAC address of the device.
- **Stream Location:** For a DM NVX encoder, **Stream Location** is read only and displays the RTSP (Real Time Streaming Protocol) URL of the encoder.

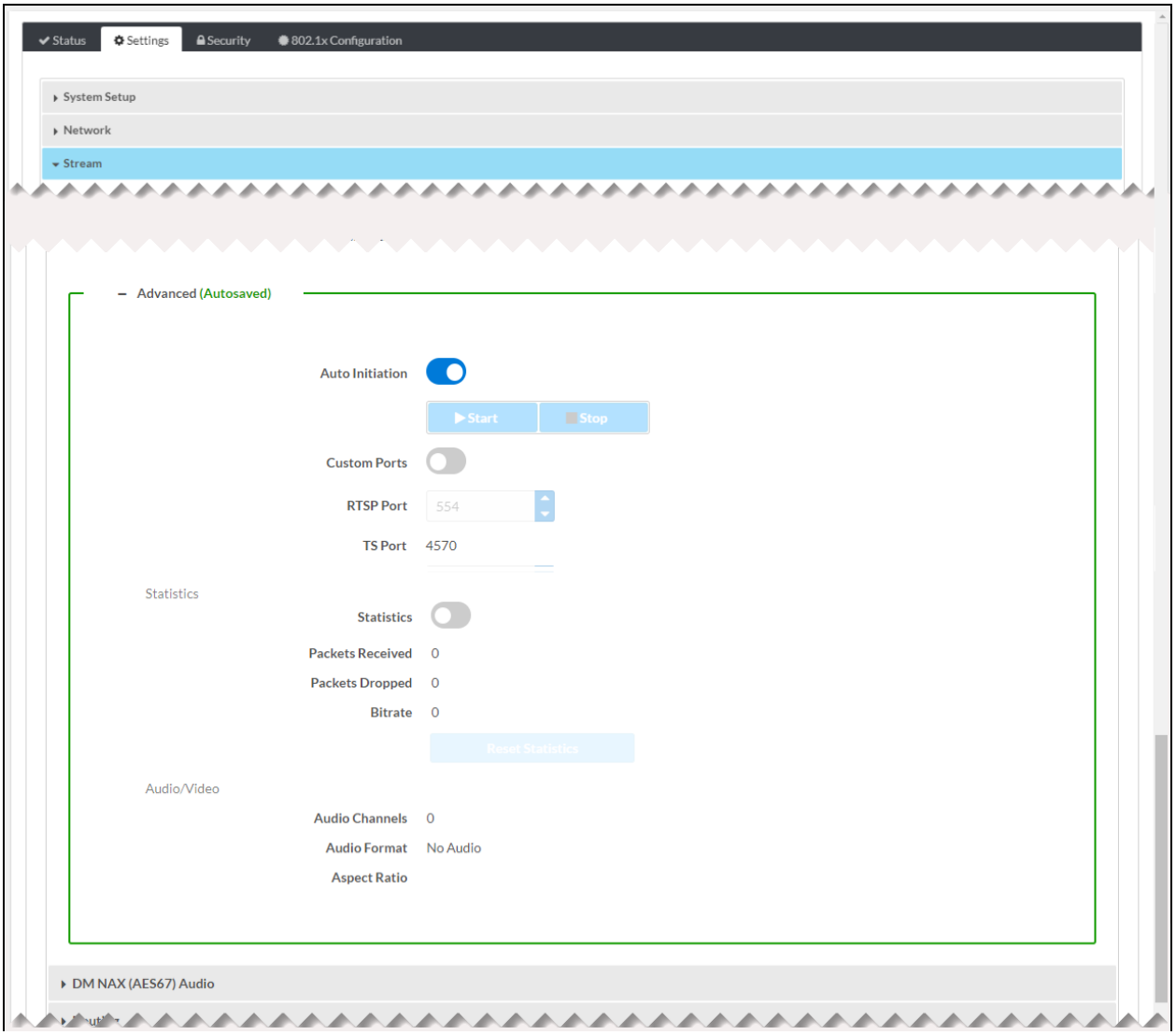
  For a DM NVX decoder, enter the RTSP URL to which the decoder can connect. The RTSP URL must not exceed 255 characters.
- **Multicast Address:** (Decoder only) Displays the primary multicast address set for the encoder
- **Status:** Displays the status of the stream: **Stream Stopped**, **Stream Started**, or **Connecting**.
- **Resolution:** Displays the video resolution being used for the video stream.

The **Advanced** section for stream configuration varies depending on whether the DM NVX device is an encoder or decoder.

### Settings Tab - Stream, Advanced (Encoder Shown)



### Settings Tab - Stream, Advanced (Decoder Shown)



In the **Advanced** section, configure the following stream settings:

> **NOTE:** When changes are made in the **Advanced** section, the changes are saved automatically.

- **Auto Initiation:** By default, **Auto Initiation** is enabled (the toggle switch is set in the On position). The stream automatically starts when the proper stream configuration settings are assigned.

  To disable **Auto Initiation**, set the toggle switch in the Off position. To start the stream, press the **Start** button. To stop the stream, press the **Stop** button.

- **Custom Ports:** By default, **Custom Ports** is disabled (the toggle switch is set in the Off position). To enable **Custom Ports**, set the toggle switch in the On position.

  When **Custom Ports** is enabled, the following port numbers can be changed as required using the scrollable text boxes:

  - **RTSP Port:** Enter an RTSP port number. Valid values range from **1** to **65535**. The default RTSP port number is **554**.
  - **TS Port:** For a DM NVX encoder, enter a TS (transmit stream) UDP port number. The value must be an even number ranging between **2** and **65534**. The default TS port number is **4570**.

    For a DM NVX decoder, the TS port number is read only and is always set to the TS port number of the encoded stream.

- (DM NVX encoder only) Configure the following:
  - **Bitrate Type:** In the drop-down list, select **Fixed** or **Adaptive**:
    - If **Fixed** is selected, set the Constant Bit Rate (CBR) of the stream in the **Bitrate** drop-down list.

      > **NOTE:** For 4K60 video, the minimum bit rate is 350 Mbps. A bit rate below 350 Mbps may display a black screen.

      Available selections are **200 Mbps**, **250 Mbps**, **300 Mbps**, **350 Mbps**, **400 Mbps**, **450 Mbps**, **500 Mbps**, **550 Mbps**, **600 Mbps**, **650 Mbps**, **700 Mbps**, **750 Mbps**, **800 Mbps**, **850 Mbps**, **900 Mbps**, **950 Mbps**, and **Custom**.

      If **Custom** is selected, enter the desired bit rate in the **Custom Bitrate** text box. Valid values range from **200** to **950** Mbps.
    - If **Adaptive** is selected, the DM NVX encoder automatically sets a fixed bit rate based on the input resolution of the stream. For example, the adaptive bit rate for a common resolution such as 1920x1080p@60Hz (1080p60) would automatically be set to 400 Mbps. Adaptive bit rate makes better use of the available bandwidth than manually selecting a **Fixed** bit rate.

      The following table lists common resolutions and the associated adaptive bit rate.

      **Resolution and Associated Adaptive Bit Rate Setting**

| Resolution | Pixels per Second | Adaptive Bit Rate (Mbps) |
|---|---|---|
| 720x480@60 Hz (480p60) | 20,736,000 | 302.777778 |
| 1280x720@50 Hz (720p50) | 46,080,000 | 326.543210 |
| 1280x720@60 Hz (720p60) | 55,296,000 | 335.185185 |
| 1920x1080@50 Hz (1080p50) | 103,680,000 | 380.555556 |
| 1920x1080@60 Hz (1080p60) | 124,416,000 | 400 |

  - **Active Bitrate:** Indicates the active bit rate of the stream
  - **Custom TTL:** Multicast TTL provides the ability to limit or extend the hop limit of a DM NVX stream that traverses routers. In IPv4 multicasting, routers have a TTL threshold assigned to each interface. Only multicast packets with a TTL greater than the threshold of the interface are forwarded.

    By default, **Custom TTL** is disabled (the toggle switch is set in the Off position). To enable **Custom TTL**, set the toggle switch in the On position.
  - **TTL:** (Applicable when **Custom TTL** is enabled) In the scrollable text box, set the desired TTL value. Values range from **1** to **255**. The default setting is **5**.

    > **NOTE:** Disabling **Custom TTL** returns the TTL value to the default setting.

- **Custom DSCP:** To implement Quality of Service (QoS), IP networks use the DSCP (Differentiated Services Code Point) value. Within an IP packet header, the DSCP defines a value from 0 to 63 that maps to a certain traffic classification. Based on IT department policies, DSCP values are used within a network to determine the treatment of packets in router queues, the routes of traffic flows, and per-hop behavior.

  By default, the **Custom DSCP** toggle switch is set in the Off position. To enable the functionality, set the toggle switch in the On position.
- **DSCP:** (Applicable when **Custom DSCP** is enabled) In the scrollable text box, set the desired DSCP value only if required by IT department policies. Values range from **0** to **63**. By default, DSCP is set to **32**.

  > **NOTE:** Disabling **DSCP** returns the DSCP value to the default setting.

### Statistics

By default, **Statistics** is disabled. To enable **Statistics**, set the toggle switch in the On position.

When **Statistics** is enabled, the following stream statistics are displayed:

- **Packets Transmitted:** (Encoder only) Displays the number of packets transmitted
- **Packets Received:** (Decoder only) Displays the number of packets received
- **Packets Dropped:** Displays the number of packets dropped
- **Bitrate:** (Decoder only) Displays the bit rate of the received stream

To reset stream statistics, click the **Reset Statistics** button.

### Audio/Video

The **Audio/Video** section displays the following information about the stream:

- **Audio Channels:** Displays the number of audio channels being transmitted by an encoder or received by a decoder
- **Audio Format:** Displays the audio format: **PCM**, **LPCM**, **LBR**, or **HBR**. If no audio exists, **No audio** is displayed.
- **Aspect Ratio:** Displays the aspect ratio of the video. If no video exists, **No Signal** is displayed.

# DM NAX (AES67) Audio

DM NAX™ audio over IP supports the AES67 standard. The selected audio source is transmitted as a 2-channel AES67 audio stream while another 2-channel AES67 audio stream is received from a Crestron DSP or other third-party device. For the DM-NVX-D10, the AES67 audio stream that is received can be combined with the video signal and then output via the HDMI output and analog audio output. For the DM-NVX-E10, the received AES67 audio stream can be output via the analog audio output.

> **NOTE:** An AES67 audio stream that is received by an endpoint cannot be transmitted from that endpoint.

To configure DM NAX (AES67) audio settings, open the **DM NAX (AES67) Audio** section of the **Settings** tab.

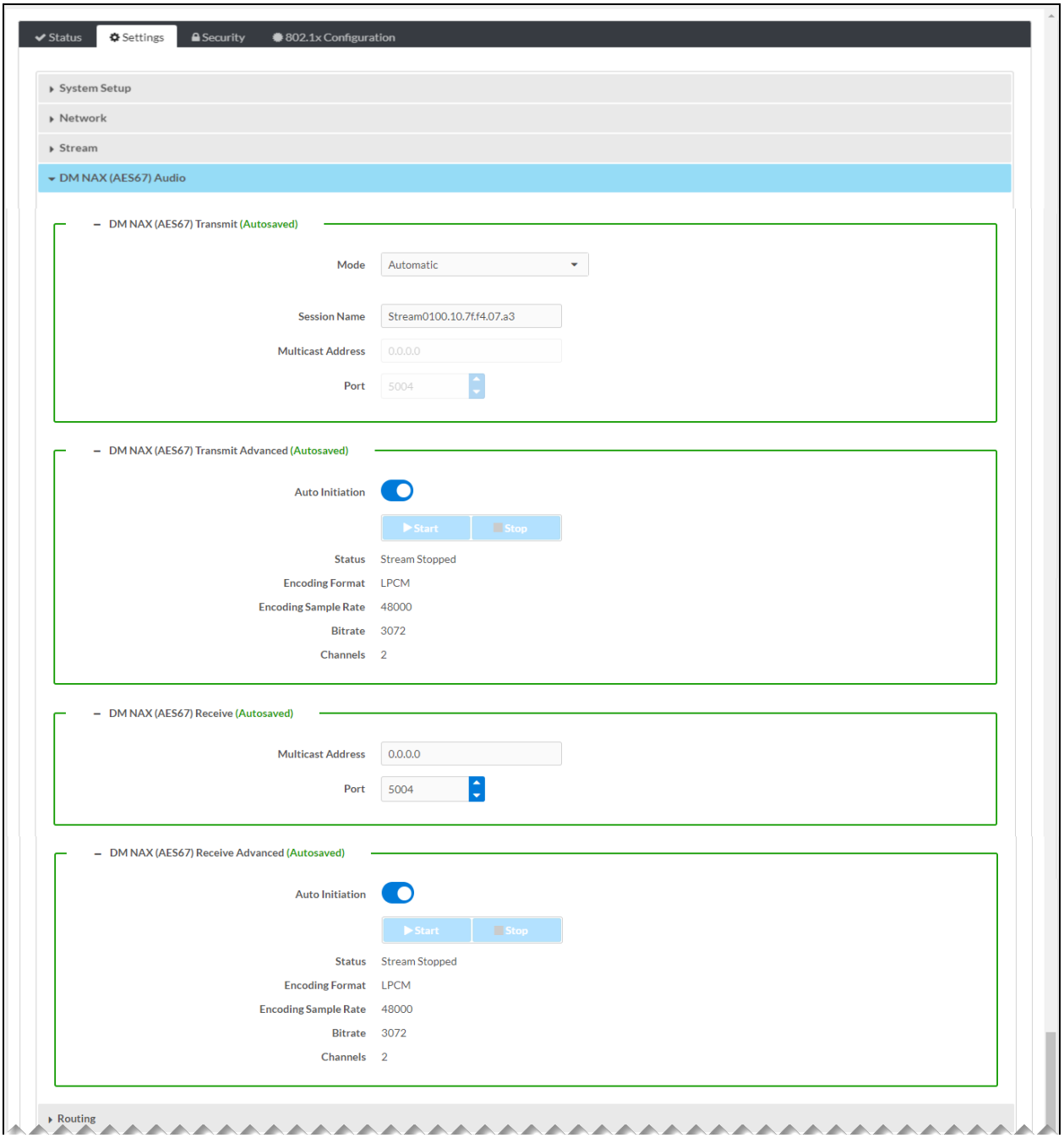
The **DM NAX (AES67) Audio** section varies depending on whether the DM NVX device is an encoder or decoder. Refer to Configuring DM NAX Audio for an Encoder or Configuring DM NAX Audio for a Decoder as appropriate.

> **NOTE:** Routing of DM NAX (AES67) signals must be configured in the **Routing** section of the **Settings** tab (refer to Routing for information).

## Configuring DM NAX Audio for an Encoder

A sample screen of the **DM NAX (AES67) Audio** section for a DM NVX encoder is shown below.

**Settings Tab - DM NAX (AES67) Audio (Encoder Shown)**




Refer to the configuration guidelines that follow.

> **NOTE:** When changes are made to DM NAX (AES67) audio settings, the changes are automatically saved.

## DM NAX (AES67) Transmit (Encoder)

- **Mode:** In the drop-down list, select one of the following:
  - **Automatic:** (Default setting) Adds 1 to the outgoing video stream multicast address. For example, if the video multicast address is 239.8.0.0, the DM NAX (AES67) multicast address is automatically set to 239.8.0.1.
  - **Disabled:** Disables the AES67 stream.
  - **Manual:** Enables a multicast address and port number to be entered in the **Multicast Address** and **Port** text boxes.
- **Session Name:** In the text box, enter a name to identify the AES67 transmit stream.
- **Multicast Address:** (Applicable when **Mode** is set to **Manual**) In the text box, enter the multicast address.
- **Port:** (Applicable when **Mode** is set to **Manual**) In the scrollable text box, enter or select the desired port number. The default port number is **4570**.

## DM NAX (AES67) Transmit Advanced (Encoder)

- **Auto Initiation:** By default, **Auto Initiation** is enabled (the toggle switch is set in the On position). The stream automatically starts when the proper configuration settings are assigned.

  To disable **Auto Initiation**, set the toggle switch in the Off position. To start the stream, press the **Start** button. To stop the stream, press the **Stop** button.
- **Status:** Displays the status of the stream: **Stream Stopped**, **Stream Started**, or **Connecting**.
- **Encoding Format:** Displays the encoding format of the stream as **LPCM**.
- **Encoding Sample Rate:** Displays the encoding sample rate of the stream in hertz (Hz), for example, 48000 Hz (48 kHz). A value of **0** indicates no stream.
- **Bitrate:** Displays the bit rate of the stream in bps (bits per second), for example, 3072 bps. A value of **0** indicates no stream.
- **Channels:** Displays the number of AES67 audio channels as **2**. A value of **0** indicates no stream.

## DM NAX (AES67) Receive (Encoder)

- **Multicast Address:** In the text box, enter the multicast address.
- **Port:** In the scrollable text box, enter or select the desired port number. The default port number is **5004**.

## DM NAX (AES67) Receive Advanced (Encoder)

- **Auto Initiation:** By default, **Auto Initiation** is enabled (the toggle switch is set in the On position). The stream automatically starts when the proper configuration settings are assigned.

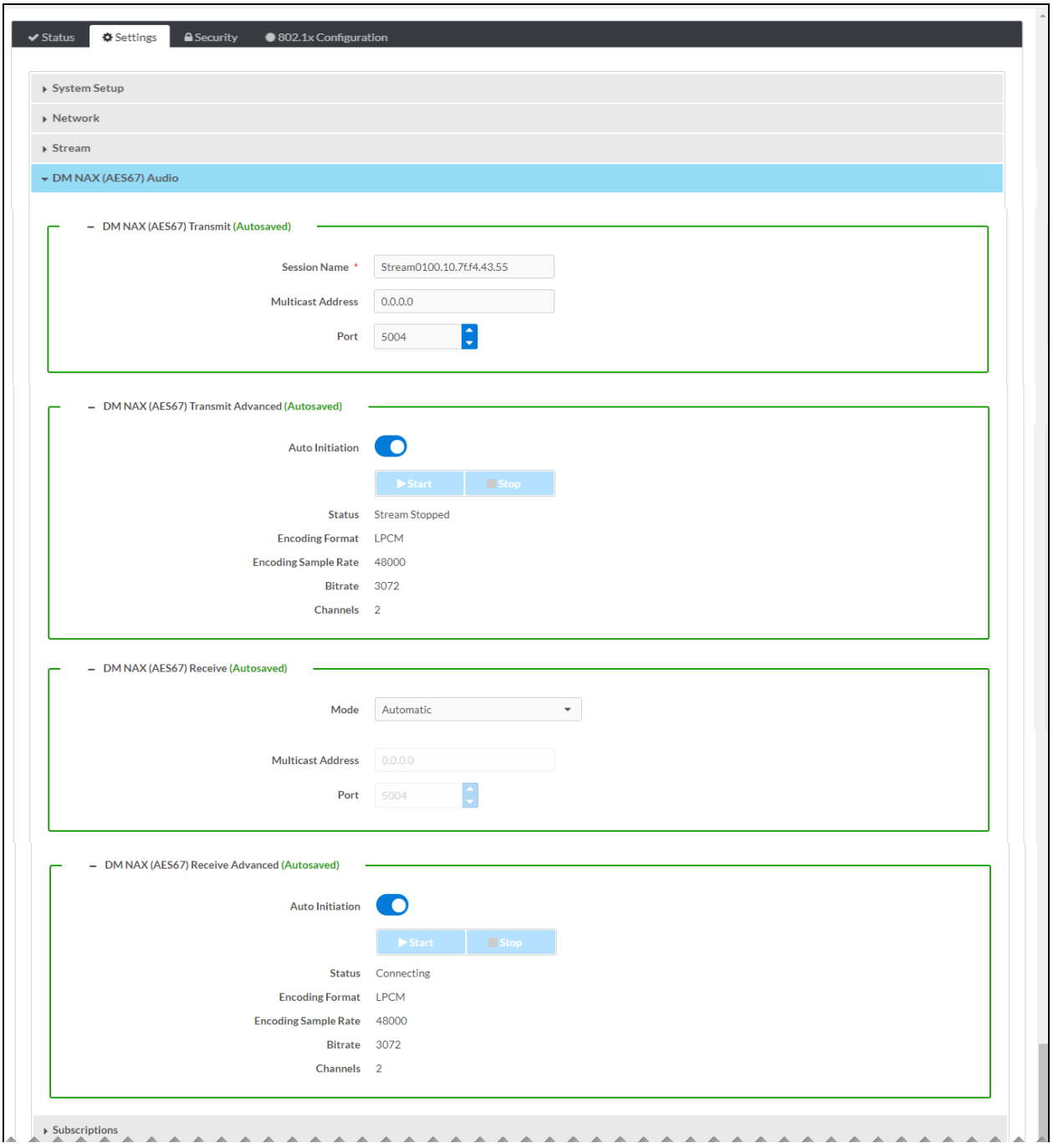
  To disable **Auto Initiation**, set the toggle switch in the Off position. To start the stream, press the **Start** button. To stop the stream, press the **Stop** button.

- **Status:** Displays the status of the stream, for example, **Stream Stopped**, **Stream Started**, or **Connecting**.
- **Encoding Format:** Displays the encoding format of the stream as **LPCM**.
- **Encoding Sample Rate:** Displays the encoding sample rate of the stream in hertz (Hz), for example, 48000 Hz (48 kHz). A value of **0** indicates no stream.
- **Bitrate:** Displays the bit rate of the stream in bps (bits per second), for example, 3072 bps. A value of **0** indicates no stream.
- **Channels:** Displays the number of AES67 audio channels as **2**. A value of **0** indicates no stream.

## Configuring DM NAX Audio for a Decoder

A sample screen of the **DM NAX (AES67) Audio** section for a DM NVX decoder is shown below.

**Settings Tab - DM NAX (AES67) Audio (Decoder Shown)**




Refer to the configuration guidelines that follow.

## DM NAX (AES67) Transmit (Decoder)

- **Session Name:** In the text box, enter a name to identify the AES67 transmit stream.
- **Multicast Address:** In the text box, enter the multicast address.
- **Port:** In the scrollable text box, enter or select the desired port number. The default port number is **5004**.

## DM NAX (AES67) Transmit Advanced (Decoder)

- **Auto Initiation:** By default, **Auto Initiation** is enabled (the toggle switch is set in the On position). The stream automatically starts when the proper configuration settings are assigned.

  To disable **Auto Initiation**, set the toggle switch in the Off position. To start the stream, press the **Start** button. To stop the stream, press the **Stop** button.

- **Status:** Displays the status of the stream: **Stream Stopped**, **Stream Started**, or **Connecting**.
- **Encoding Format:** Displays the encoding format of the stream as **LPCM**.
- **Encoding Sample Rate:** Displays the encoding sample rate of the stream in hertz (Hz), for example, 48000 Hz (48 kHz). A value of **0** indicates no stream.
- **Bitrate:** Displays the bit rate of the stream in bps (bits per second), for example, 3072 bps. A value of **0** indicates no stream.
- **Channels:** Displays the number of AES67 audio channels as **2**. A value of **0** indicates no stream.

## DM NAX (AES67) Receive (Decoder)

- **Mode:** In the drop-down list, select one of the following:
  - **Automatic:** (Default setting) Adds 1 to the incoming video stream multicast address. For example, if the video multicast address is 239.8.0.0, the DM NAX (AES67) multicast address is automatically set to 239.8.0.1.
  - **Disabled**: Disables the AES67 stream.
  - **Manual:** Enables a multicast address and port number to be entered in the **Multicast Address** and **Port** text boxes.
- **Multicast Address:** (Applicable when **Mode** is set to **Manual**) In the text box, enter the multicast address.
- **Port:** (Applicable when **Mode** is set to **Manual**) In the scrollable text box, enter or select the desired port number. The default port number is **5004**.

## DM NAX (AES67) Receive Advanced (Decoder)

- **Auto Initiation:** By default, **Auto Initiation** is enabled (the toggle switch is set in the On position). The stream automatically starts when the proper configuration settings are assigned.

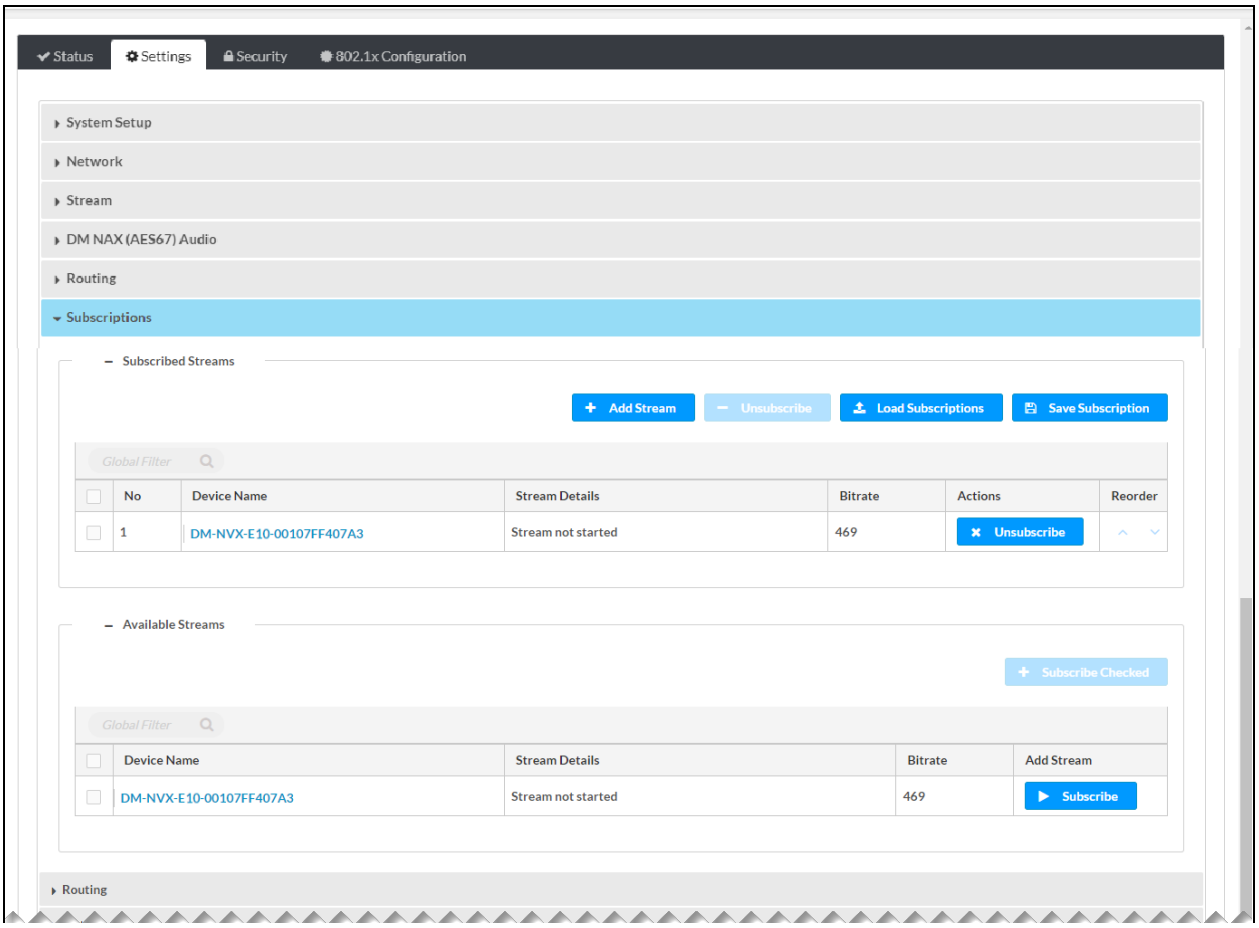
  To disable **Auto Initiation**, set the toggle switch in the Off position. To start the stream, press the **Start** button. To stop the stream, press the **Stop** button.
- **Status:** Displays the status of the stream: **Stream Stopped**, **Stream Started**, or **Connecting**.
- **Encoding Format:** Displays the encoding format of the stream as **LPCM**.
- **Encoding Sample Rate:** Displays the encoding sample rate of the stream in hertz (Hz), for example, 48000 Hz (48 kHz). A value of **0** indicates no stream.
- **Bitrate:** Displays the bit rate of the stream in bps (bits per second), for example, 3072 bps. A value of **0** indicates no stream.
- **Channels:** Displays the number of AES67 audio channels as **2**. A value of **0** indicates no stream.

# Subscriptions (Decoder Only)

Subscription of a DM NVX encoder to a DM NVX decoder sets up Real Time Streaming Protocol (RTSP) negotiation between the decoder and the encoder. When a stream is routed, the DM NVX decoder performs the Internet Group Management Protocol (IGMP) join, which causes the decoder to join the multicast group of the encoder. A maximum of 64 encoders can be subscribed to a single decoder.

To configure subscriptions, open the **Subscriptions** section of the **Settings** tab.

**Settings Tab - Subscriptions (Decoder Only)**



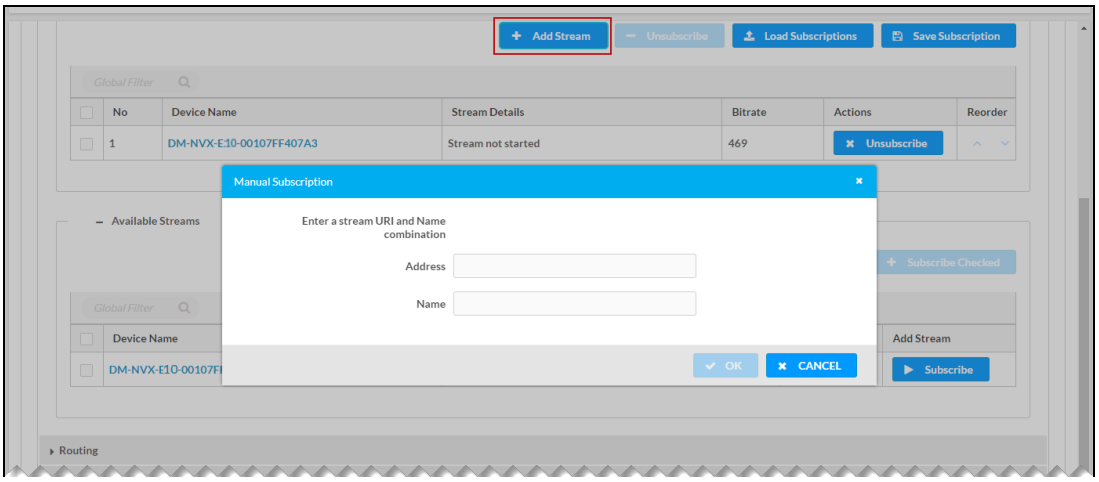

The **Subscribed Streams** and **Available Streams** sections can be used to subscribe encoders to the decoder. The encoders can also be unsubscribed from the decoder.

## Subscribed Streams

The **Subscribed Streams** section provides a table listing encoders that have been subscribed to the decoder. To subscribe additional encoders to the decoder, do any of the following:

- Manually add each encoder for subscription to the decoder as follows:
  1. Click the **Add Stream** button. The Manual Subscription pop-up dialog box opens.

     **Manual Subscription Pop-Up Dialog Box**

  2. Enter the RTSP address and name of the encoder, and then click **OK**.

     The encoder is added to the **Subscribed Streams** table, which shows the number, device name, stream details, and bit rate of the subscribed stream. If a stream has been started, the **Stream Details** column displays the RTSP address of the encoder. If the stream has not been started, the **Stream Details** column indicates **Stream not started**.

     > **NOTE:** Subscribed encoders can be reordered in the list. To do so, click the Move Up or Move Down icon in the **Reorder** column until the encoder appears in the desired location in the list.

- Load one or more subscription lists (*.xml) from a computer as follows:

  > **NOTE:** The default filename of the subscription list is **subscription.xml**.

  1. Click the **Load Subscriptions** button. The **File Upload** pop-up dialog box opens.
  2. Click **Browse**. File Explorer opens.
  3. Navigate to the desired file, select the file, and then click **Open**.
  4. In the **File Upload** dialog box, click the **Load** button. When the file upload process is complete, the **File upload is complete** message appears.
  5. Click **OK** to close the dialog box.
- Subscribe one or more encoders listed in the **Available Streams** table (refer to Available Streams for information).

Each subscribed encoder is added to the **Subscribed Streams** table.

If desired, save the subscribed encoders to a file by clicking the **Save Subscriptions** button. The subscribed encoders are downloaded to a file named **subscription.xml** by default.

To unsubscribe one or more encoders listed in the **Subscribed Streams** table, do any of the following:

- To unsubscribe an encoder on an individual basis, click the corresponding **Unsubscribe** button in the **Actions** column. The encoder is removed from the list.
- To unsubscribe all encoders simultaneously, select the topmost check box in the first column. The check boxes for all encoders in the list are automatically selected. Click the **Unsubscribe** button above the **Subscribed Streams** table.
- To unsubscribe some encoders simultaneously, select the corresponding check boxes in the first column of the **Subscribed Streams** table, and then click the **Unsubscribe** button above the **Subscribed Streams** table.

## Available Streams

The **Available Streams** section provides a table listing available encoders that can be subscribed to the decoder:

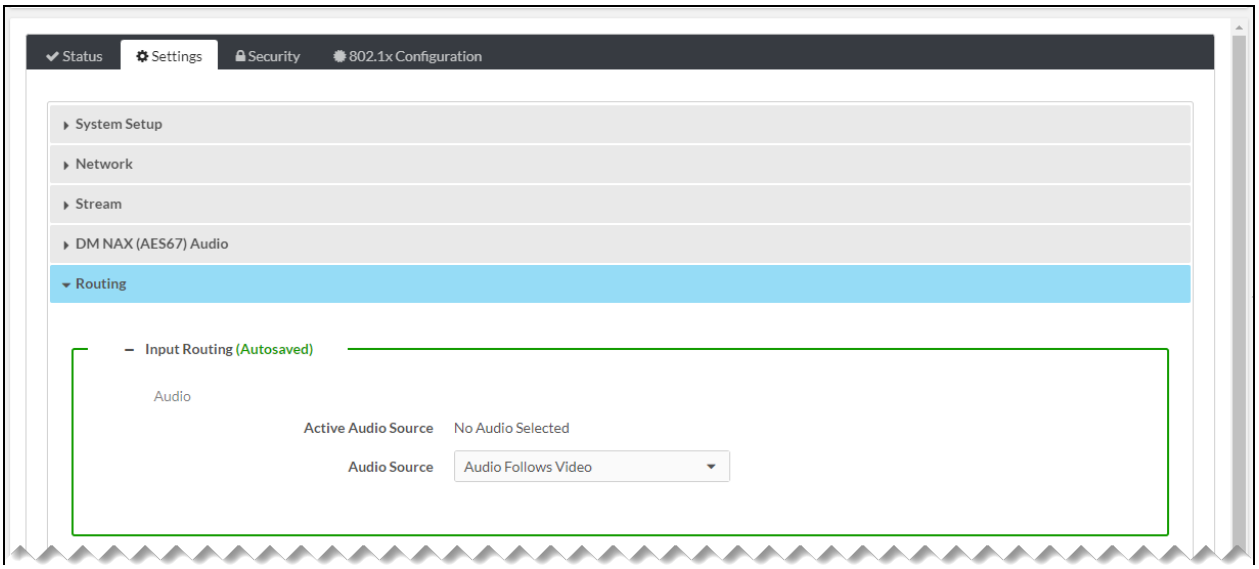
- To subscribe an encoder on an individual basis, click the corresponding **Subscribe** button in the **Add Stream** column.
- To subscribe all encoders simultaneously, select the topmost check box in the first column. The check boxes for all encoders in the list are automatically selected. Click the **Subscribe Checked** button above the **Available Streams** table.
- To subscribe some encoders simultaneously, select the corresponding check boxes in the first column of the **Available Streams** table, and then click the **Subscribe Checked** button above the **Available Streams** table.

The subscribed encoders are added to the **Subscribed Streams** table.

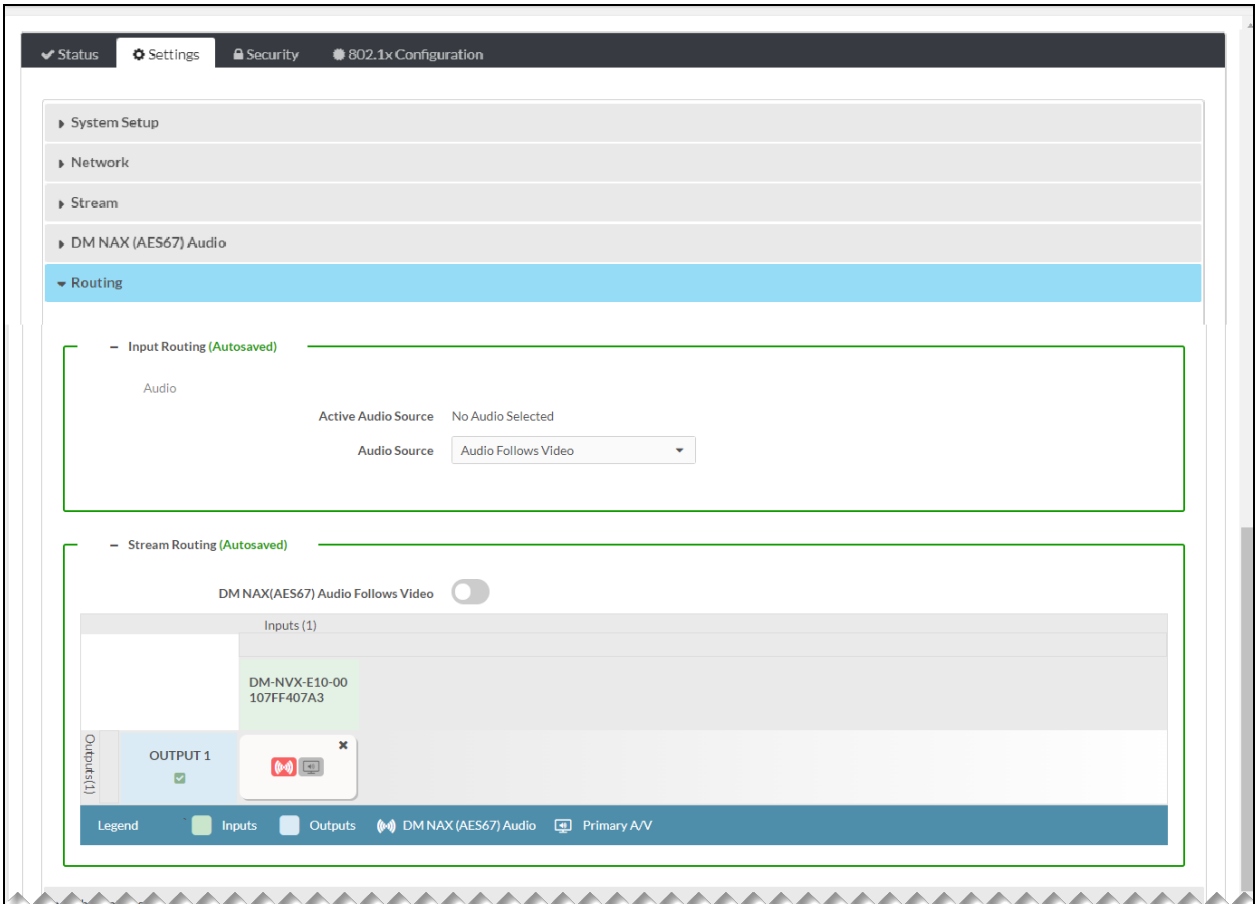
# Routing

To configure routing settings, open the **Routing** section of the **Settings** tab. The Routing section differs depending on whether the DM NVX device is an encoder or decoder.

**Settings Tab - Routing (Encoder Shown)**



**Settings Tab - Routing (Decoder Shown)**




Refer to the configuration guidelines that follow.

## Input Routing

> **NOTE:** When changes are made in the **Input Routing** section, the changes are saved automatically.

### Audio

- **Active Audio Source:** Displays the active audio source as one of the following: **Input 1** (encoder only), **DM NAX (AES67) Audio**, **Primary Stream Only** (decoder only), **Analog Audio** (DM-NVX-E20-2G only), or **No Audio Selected**

- **Audio Source:** In the drop-down list, select the desired audio source:
  - **Audio Follows Video:** The audio signal is always switched with the video signal.
  - **Input 1:** (Encoder only) The audio signal from the input is sent to the network video stream.
  - **Primary Stream Audio:** (Decoder only) The audio signal is combined with the video from the incoming network video stream.
  - **DM NAX (AES67) Audio:** The audio signal is independent of the primary audio/video stream.

## Stream Routing (Decoder Only)

> **NOTE:** When changes are made in the **Stream Routing** section, the changes are saved automatically.

**DM NAX (AES67) Audio Follows Video:** By default, **DM NAX (AES67) Audio Follows Video** is disabled (the toggle switch is set in the Off position). To enable the functionality, set the toggle switch in the On position.

When **DM NAX (AES67) Audio Follows Video** is enabled, DM NAX (AES67) audio is always switched with the video.

**Inputs/Outputs:** The table provides cells identifying the decoder and the subscribed encoders.

> **NOTE:** The Inputs/Outputs table appears only when encoders have been subscribed to the decoder. If no encoders have been subscribed, a message appears indicating that there are no active subscriptions. In order to route video, subscribe encoders to the decoder in the **Subscriptions** section of the **Settings** tab.

In the Inputs/Outputs table, the cell for the decoder is named **OUTPUT 1** by default and is shaded blue. Cells for the DM NVX encoders are shaded green. Icons for each encoder represent streams: one DM NAX (AES67) audio stream (  ) and one primary A/V stream (  ). When the stream icons are not selected, the icons are shaded gray. When the icons are selected, the **DM NAX (AES67) Audio** icon turns pink and the **Primary A/V** icon turns purple.

For each encoder in the table, select the desired stream to be routed to the decoder (output):

- If **DM NAX (AES67) Audio Follows Video** is disabled (default setting), click the **DM NAX (AES67) Audio** icon, the **Primary A/V** icon, or both as desired.
- If **DM NAX (AES67) Audio Follows Video** is enabled and the primary A/V stream is desired, click the **Primary A/V** icon. The **DM NAX (AES67) Audio** icon is automatically selected, enabling DM NAX (AES67) audio to be routed with the video.

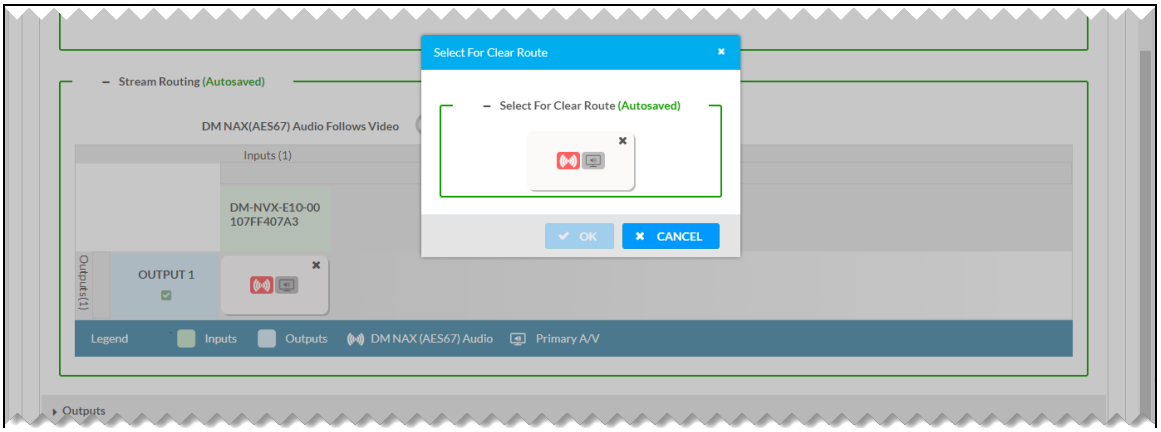
Streams can be cleared for encoders on an individual basis or can be cleared for all encoders on a global basis. To clear streams for encoders on an individual basis, do either of the following in the cell containing the stream icons for an encoder:

- If **DM NAX (AES67) Audio Follows Video** is disabled, click the stream to be cleared (pink icon for DM NAX [AES67] audio or purple icon for Primary A/V). To clear both streams simultaneously, click the **x** in the upper-right corner of the cell.
- If **DM NAX (AES67) Audio Follows Video** is enabled, click the **Primary A/V** icon to clear the stream. The DM NAX (AES67) stream is automatically cleared.

To clear streams for all encoders on a global basis:

1. Select the check box under the output name (the default output name is **OUTPUT 1**). The **Select For Clear Route** pop-up dialog box opens.

   **Select for Clear Route Pop-Up Dialog Box**



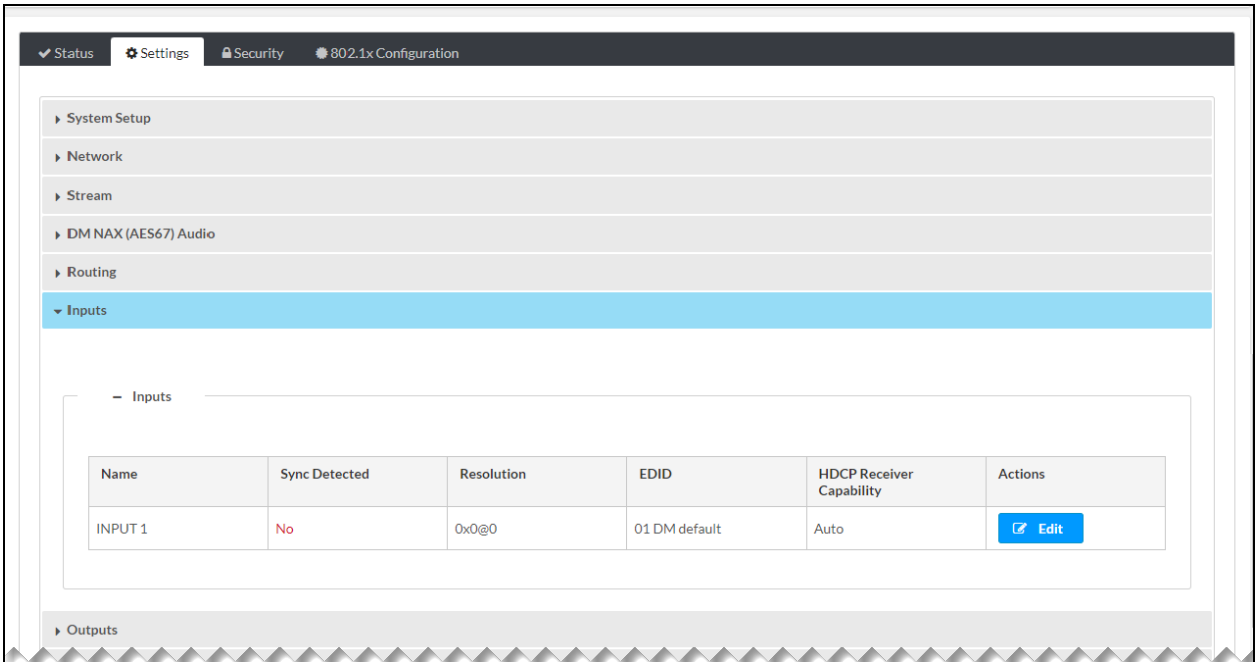

2. Do either of the following:
   - If **DM NAX (AES67) Audio Follows Video** is disabled, click the stream to be cleared (pink icon for DM NAX [AES67] audio or purple icon for Primary A/V), and then click **OK** to close the dialog box. To clear both streams simultaneously, click the **x** in the upper-right corner of the cell and then click **OK**.
   - If **DM NAX (AES67) Audio Follows Video** is enabled, click the **Primary A/V** icon or the **x** in the upper-right corner of the cell and then click **OK** to clear the stream. DM NAX (AES67) is automatically cleared when the primary A/V stream is cleared.

# Inputs (Encoder Only)

To view information about the HDMI input or to configure the input, open the **Inputs** section of the **Settings** tab.

> **NOTE:** If required, add a user EDID (Extended Display Identification Data) before configuring the input. To add a user EDID, refer to Managing EDIDs).

**Settings Tab - Inputs (Encoder Only)**

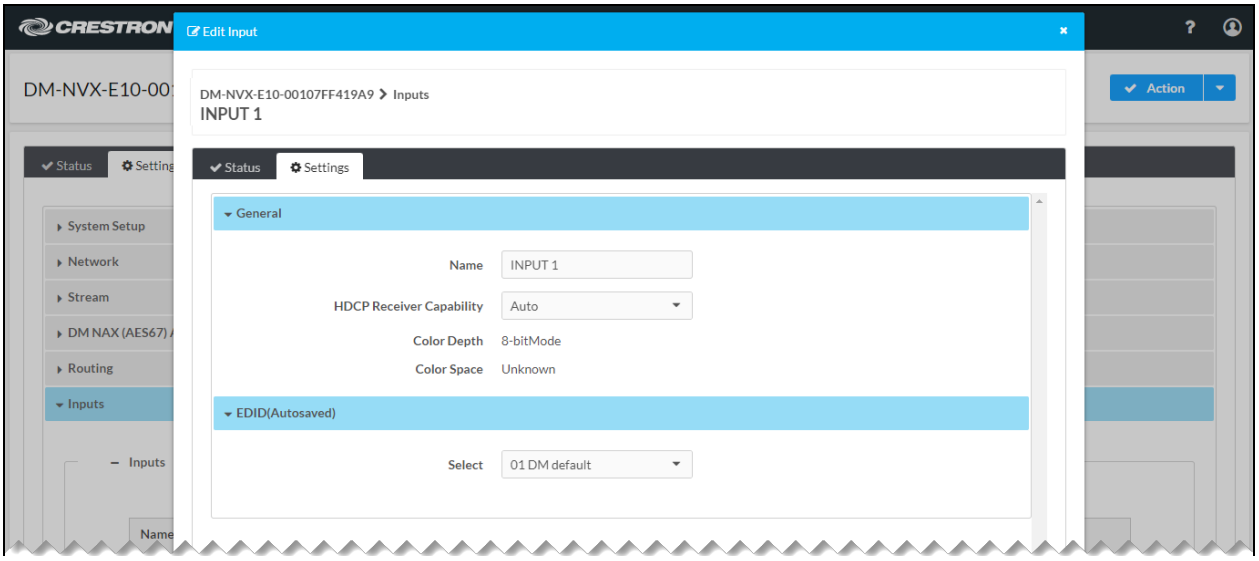



The Inputs table displays the following information:

- **Name:** Indicates the name of the HDMI input. The default input name is **INPUT 1**.
- **Sync Detected:** Indicates whether an HDMI signal is detected by the input (**Yes** or **No**)
- **Resolution:** Indicates the current resolution of the input. If **0x0@0** is displayed, no video signal is being transmitted.
- **EDID:** Indicates the EDID that is to be sent to the upstream device connected to the HDMI input.
- **HDCP Receiver Capability:** Indicates one of the following: **Disabled**, **Auto**, or **HDCP 1.4**.

To edit input settings or to view additional input status information, click the **Edit** button in the **Actions** column of the table. The **Edit Input** pop-up dialog box opens.

### Edit Input Pop-Up Dialog Box



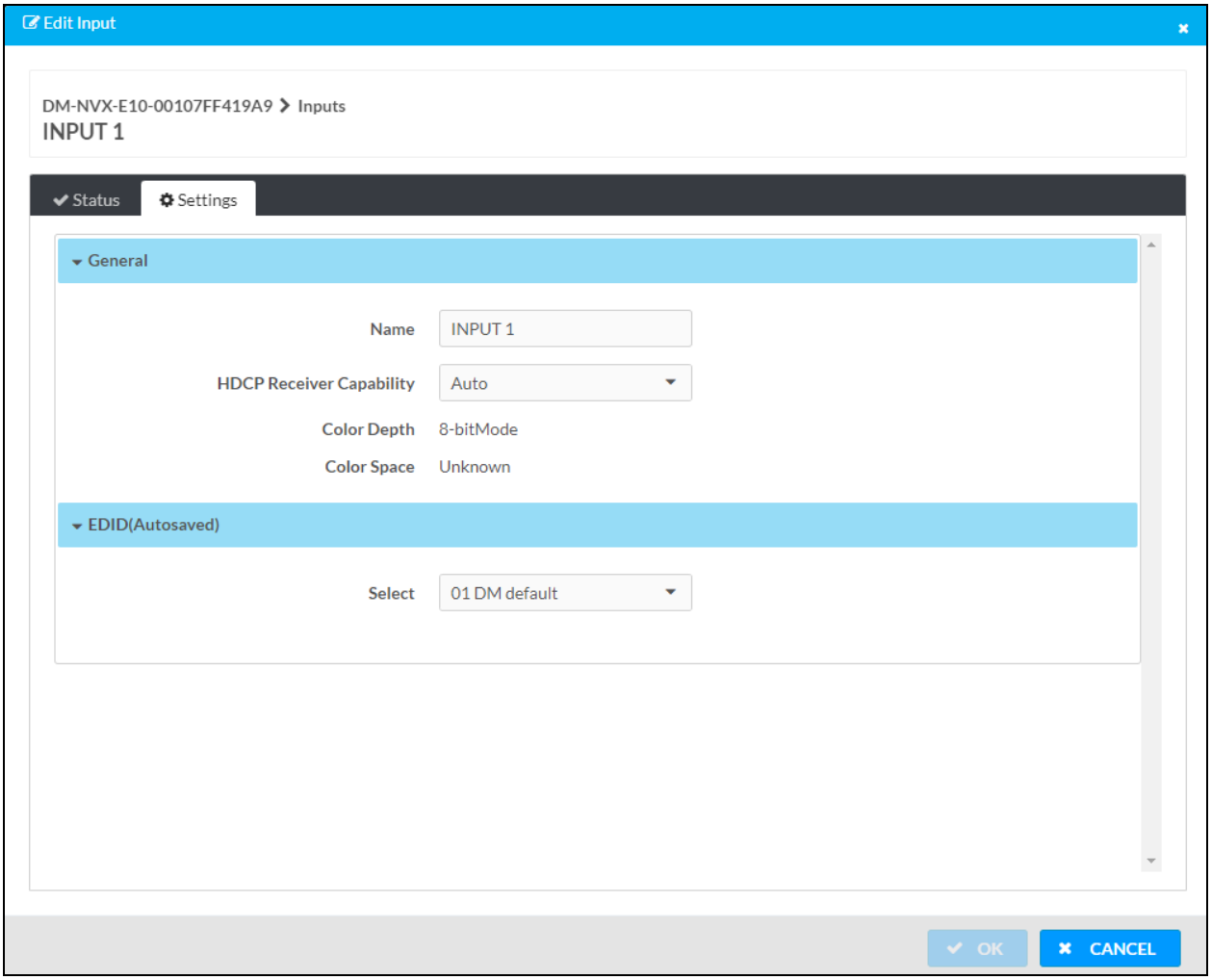

The **Edit Input** pop-up dialog box provides the following tabs:

- Settings (refer to Editing Input Settings for information).
- Status (refer to Viewing Input Status for information).

## Editing Input Settings

By default, the **Settings** tab of the **Edit Input** pop-up dialog box is displayed when the dialog box opens.

Edit Input Pop-Up Dialog Box - Settings Tab




The **Settings** tab of the **Edit Input** pop-up dialog box provides the following sections:

- General
- EDID

## General

Configure or view information about the input:

- **Name:** In the text box, enter the desired name of the input. The default name is **INPUT 1**.
- **HDCP Receiver Capability:** In the drop-down list, select one of the following to control HDCP (High-Bandwidth Digital Content Protection) support for the HDMI input:
  - **Disabled:** Disables HDCP, causing the HDMI input to transmit non-HDCP content only.
  - **Auto:** (Default setting) Enables the HDMI input to transmit content based on the highest HDCP level of the connected source.
  - **HDCP 1.4:** Sets the HDCP level to 1.4 for HDCP content transmission by the HDMI input.
- **Color Depth:** Indicates one of the following: **8-bit Mode**, **10-bit Mode**, or **12-bit Mode**.
- **Color Space:** Indicates one of the following: **Unknown**, **RGB**, **Y444**, **Y422**, or **Y420**.

## EDID

> **NOTE:** When a change is made to the **EDID** section, the change is automatically saved.

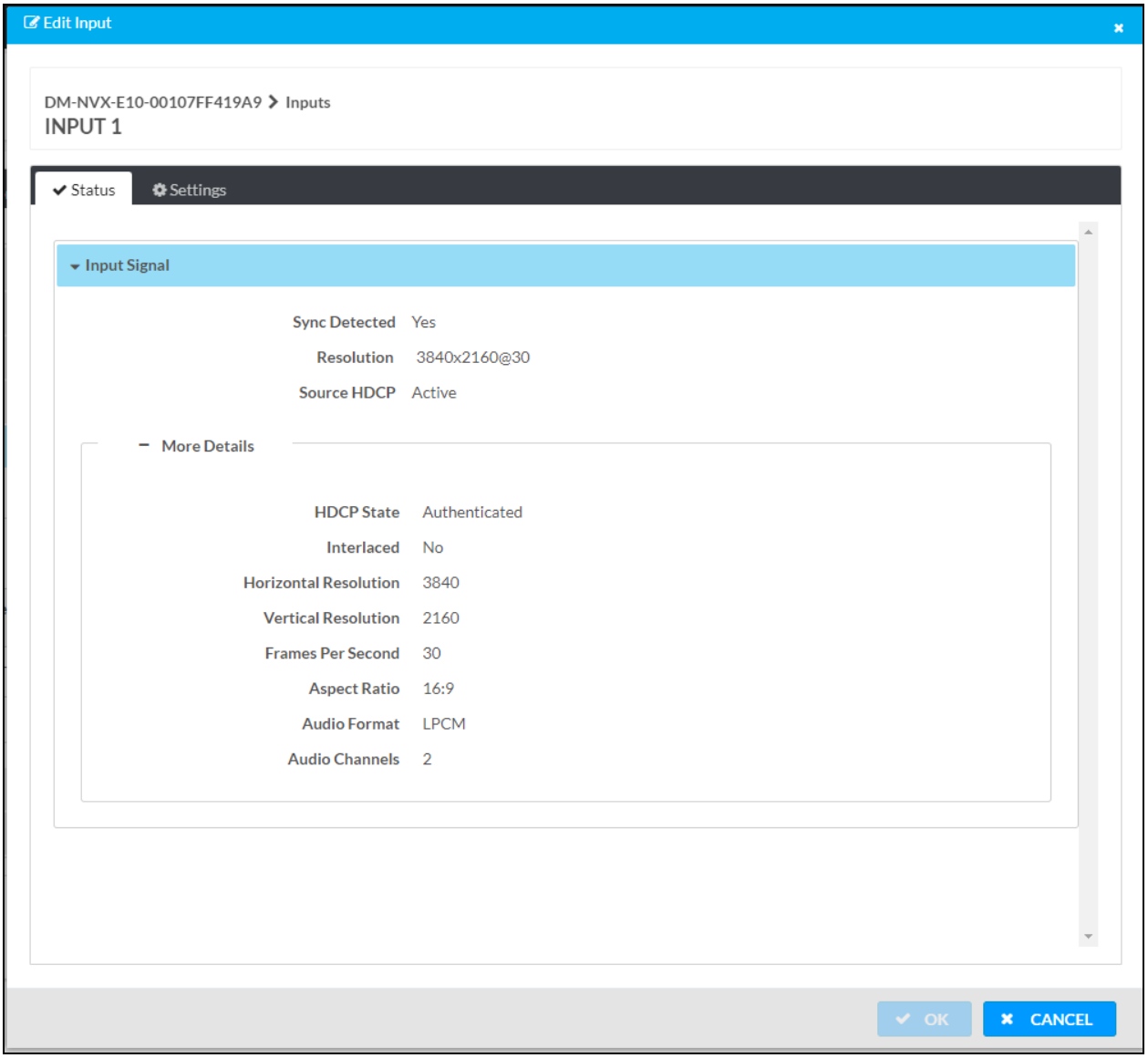
In the **EDID** drop-down list, select the desired EDID. If the desired EDID does not appear in the list, refer to Managing User EDIDs to add the EDID to the list.

Click **OK** to save changes to the **General** section and close the **Edit Input** pop-up dialog box. If no changes were made to the **General** section, click **CANCEL** to close the dialog box.

## Viewing Input Status

Click the **Status** tab of the **Edit Input** pop-up dialog box to view additional information about the HDMI input signal.

**Edit Input Pop-Up Dialog Box - Status Tab**




The **Status** tab displays the following information about the HDMI input signal:

- Sync Detected
- Resolution
- Source HDCP

The **More Details** section displays the following information:

- HDCP State
- Interlaced
- Horizontal Resolution
- Vertical Resolution
- Frames Per Second
- Aspect Ratio
- Audio Format
- Audio Channels

Click **CANCEL** to close the **Edit Input** pop-up dialog box.

# Outputs

Output configuration varies depending on whether the DM NVX device is an encoder or decoder. Refer to Configuring Output for an Encoder or Configuring Output for a Decoder as appropriate.

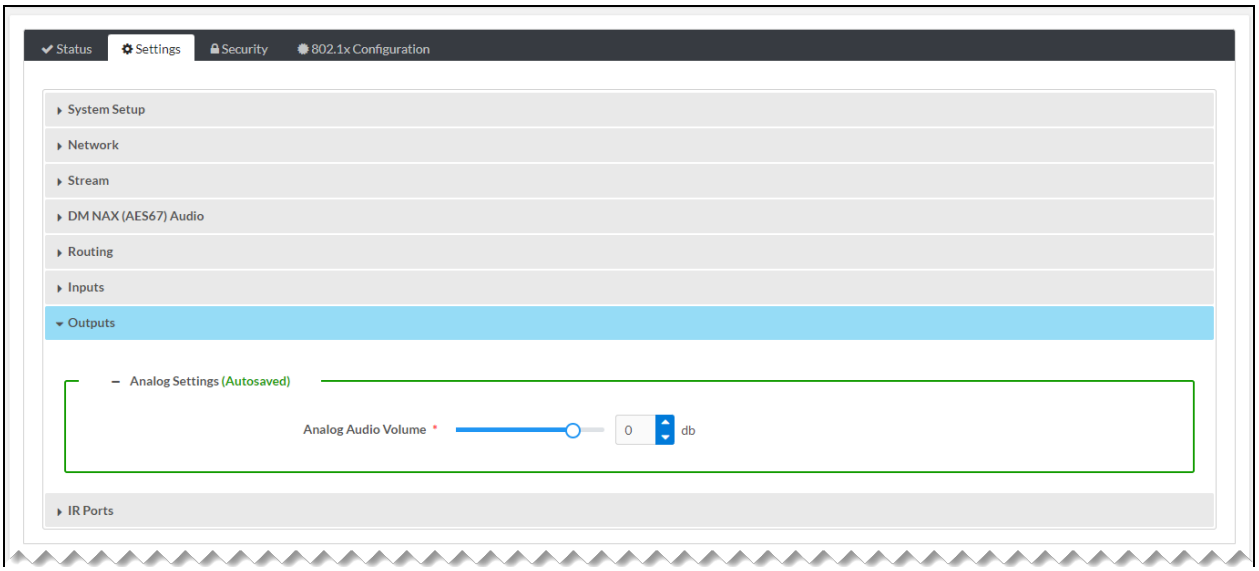
## Configuring Output for an Encoder

The analog audio output can provide a stereo line-level signal to feed a local sound system or sound bar.

> **NOTE:** The analog audio output is functional only when the encoder is receiving a 2-channel stereo input signal.

To change the volume of the analog audio output, open the **Outputs** section of the **Settings** tab.

**Settings Tab - Outputs (Encoder)**



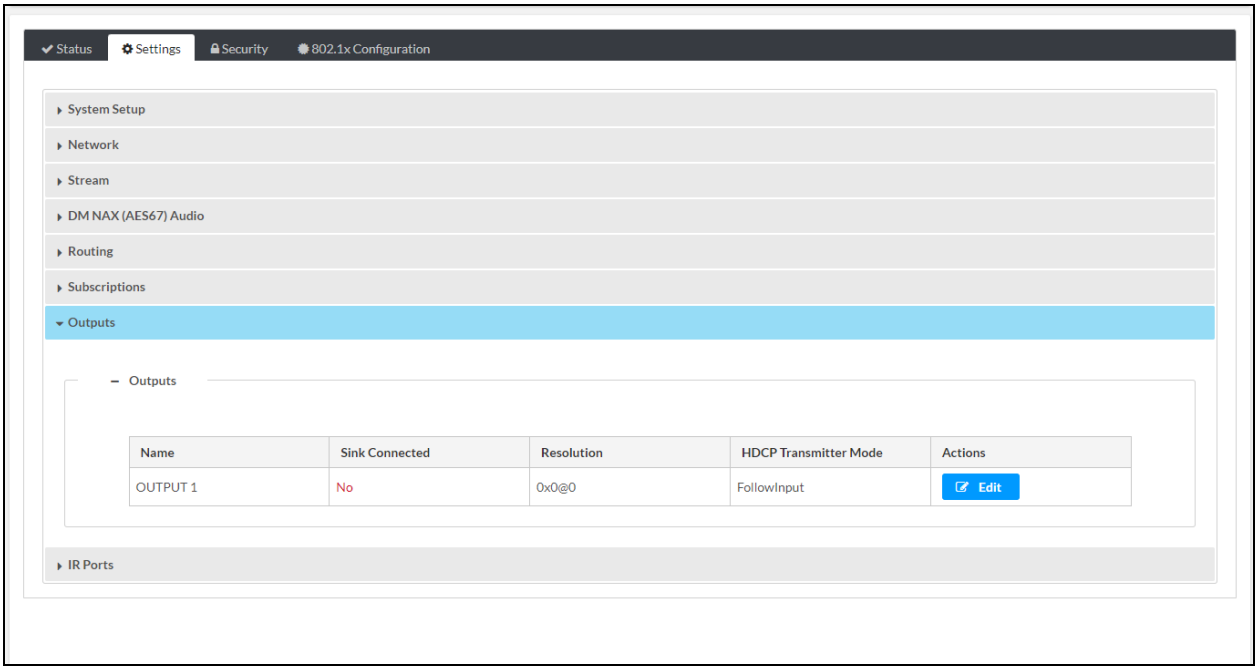
**NOTE:** When a change is made to the analog audio volume, the change is automatically saved.

To change the analog audio volume, move the slider or use the scrollable text box to set the desired number of decibels (dB). Values range from **-80** to **24** dB. The default setting is **0** dB.

## Configuring Output for a Decoder

To configure the HDMI output or to view information about the output, open the **Outputs** section of the **Settings** tab.

**Settings Tab - Outputs (Decoder)**

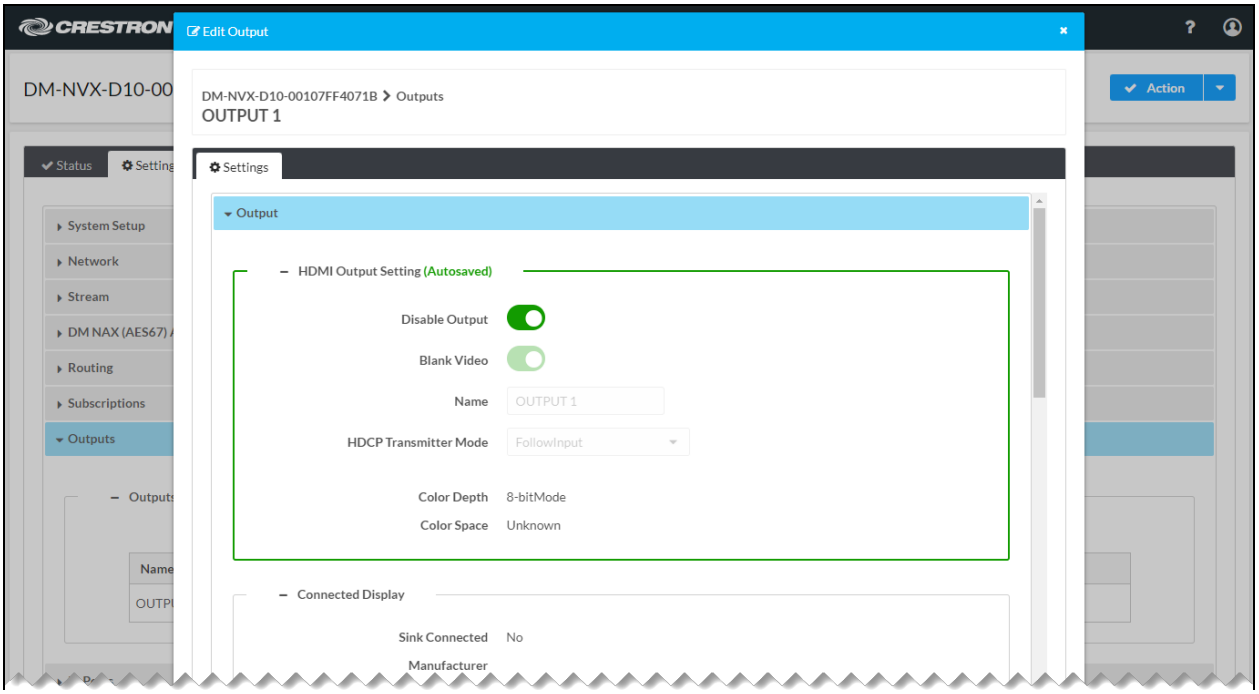



The Outputs table displays the following information:

- **Name:** Displays the name of the output. The default output name is **OUTPUT 1**.
- **Sink Connected:** Indicates whether the HDMI output is connected to a display device (**Yes** or **No**)
- **Resolution:** Indicates the current resolution of the output. If **0x0@0** is displayed, no video signal is being transmitted.
- **HDCP Transmitter Mode:** Indicates one of the following: **Auto**, **Follow Input**, **Always**, or **Never**.

To view additional output settings or to edit output settings, click the **Edit** button in the **Actions** column of the table. The **Edit Output** pop-up dialog box opens.

### Edit Output Pop-Up Dialog Box (Decoder Only)



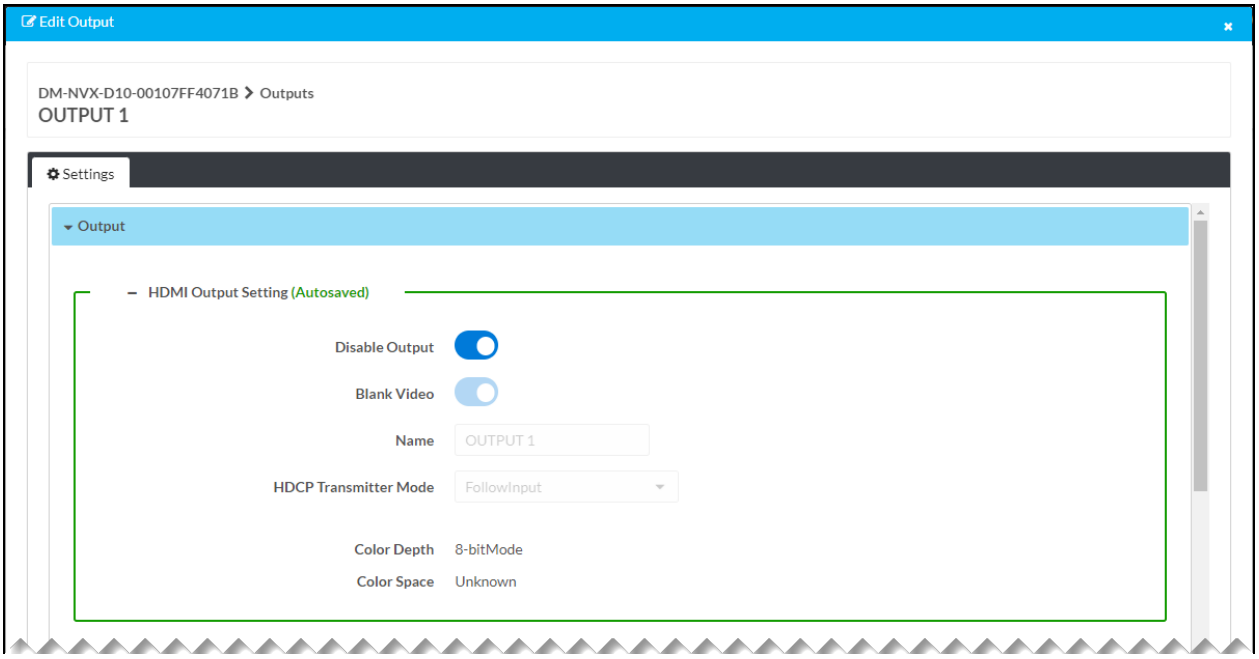

The **Edit Output** pop-up dialog box consists of the following sections:

- HDMI output setting
- Connected display
- Output signal
- Analog settings
- Automatic display power

## HDMI Output Setting

The **HDMI Output** section of the **Edit Output** dialog box enables configuration of output settings.

**Edit Output Dialog Box - HDMI Output Setting (Decoder Only)**




Refer to the configuration guidelines that follow.

**NOTE:** When changes are made to HDMI output settings, the changes are automatically saved.

- **Disable Output:** By default, **Disable Output** is disabled (the toggle switch is set in the Off position). To enable the functionality, set the toggle switch in the On position.

  When **Disable Output** is enabled, the HDMI output is disabled.

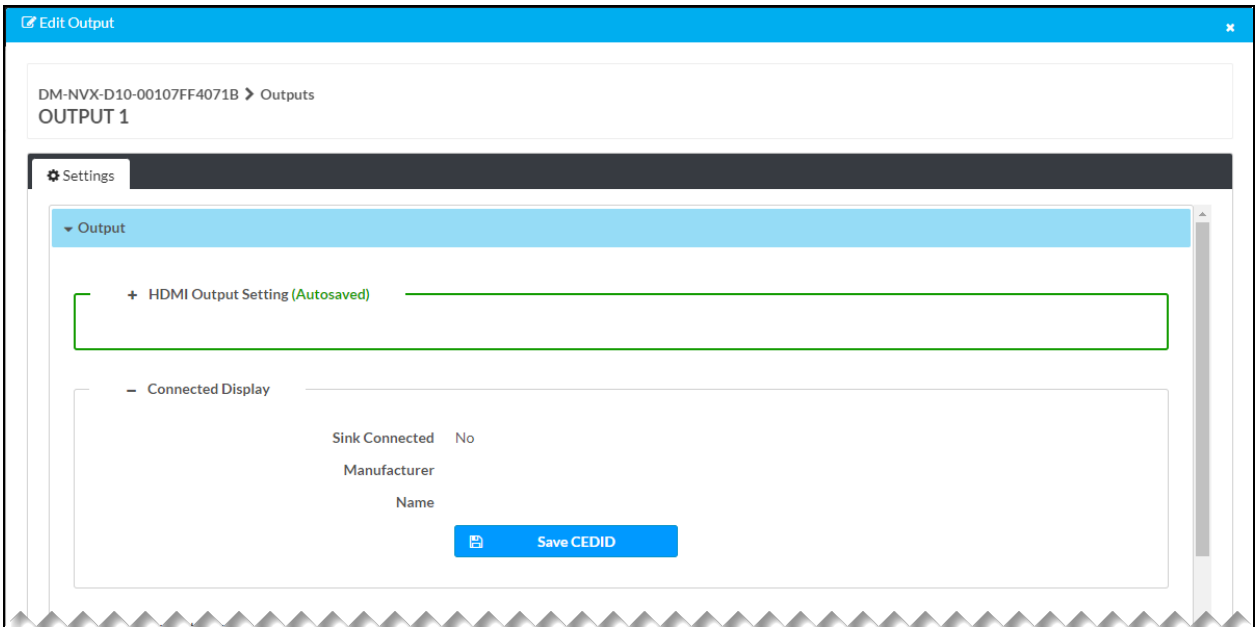
- **Blank Video:** By default, **Blank Video** is disabled (the toggle switch is in the Off position). To enable the functionality, set the toggle switch in the On position.
- **Name:** (Not applicable when **Disable Output** is enabled) In the text box, enter a name for the output. The default name is **OUTPUT 1**.
- **HDCP Transmitter Mode:** (Not applicable when **Disable Output** is enabled) In the drop-down list, select one of the following:
  - **Auto:** (Default setting) Enables HDCP for the output at the highest HDCP level required by the source device.
  - **Follow Input:** Enables HDCP for the output only when the input requires HDCP. If the input does not require HDCP, HDCP is disabled for the output.
  - **Always:** Enables HDCP for the output regardless of the input requirements.
  - **Never:** Disables HDCP for the output regardless of the input requirements.

- **Color Depth:** Indicates the color depth of the output: **8-bit mode**, **10-bit mode**, or **12-bit mode**.
- **Color Space:** Indicates the color space of the output: **Auto**, **Force RGB**, **Force Y444**, **Force Y422**, or **Unknown**.

## Connected Display

The **Connected Display** section of the **Edit Output** dialog box displays information about the connected display device.

**Edit Output Dialog Box - Connected Display (Decoder Only)**




The following information is displayed:

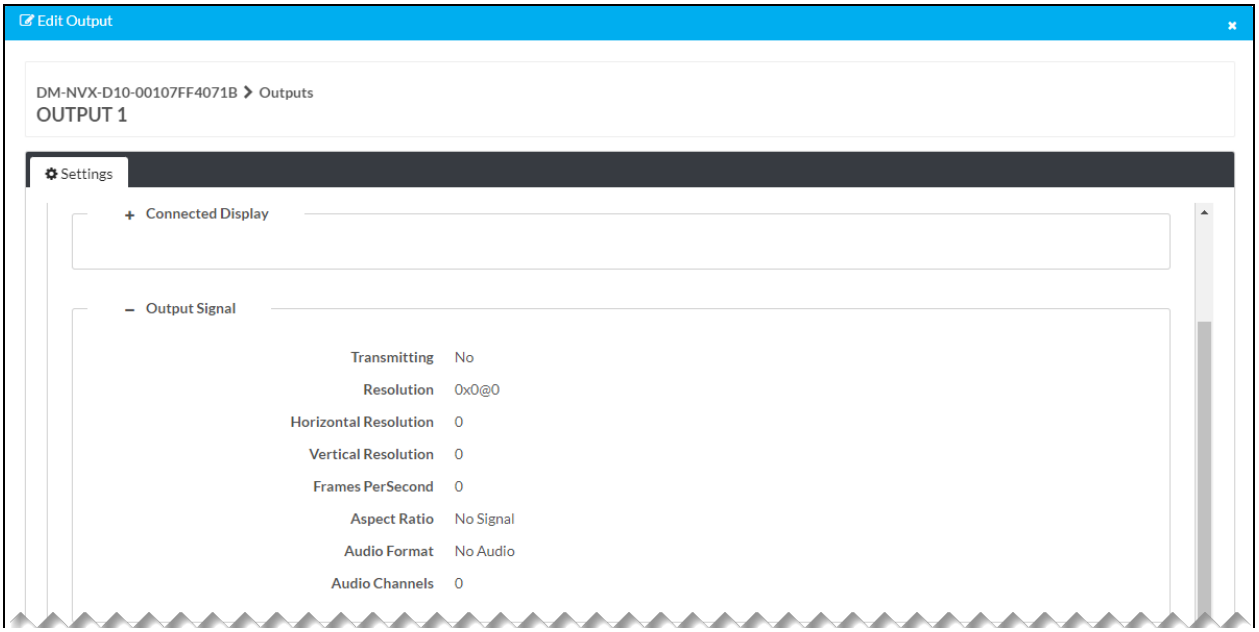
- **Sink Connected:** Indicates whether the HDMI output is connected to a display device (**Yes** or **No**)
- **Manufacturer:** Indicates the manufacturer of the display device
- **Name:** Indicates the name of the display device

To download the EDID file (**sink.cedid**) of the connected display to a computer, click the **Save CEDID** button.

## Output Signal

The **Output Signal** section of the **Edit Output** dialog box displays information about the HDMI output signal.

**Edit Output Dialog Box - Output Signal (Decoder Only)**




The following information is displayed:

- **Transmitting:** Displays whether the output signal is being transmitted to the display device (**Yes** or **No**)
- **Resolution:** Displays the resolution of the output signal.
- **Horizontal Resolution:** Displays the number of pixels of the horizontal resolution
- **Vertical Resolution:** Displays the number of pixels of the vertical resolution
- **Frames Per Second:** Displays the number of frames that are being transmitted per second
- **Aspect Ratio:** Displays the aspect ratio of the output signal.
- **Audio Format:** Displays the audio format of the output signal. If no audio format exists, **NoAudio** is displayed.
- **Audio Channels:** Displays the number of audio channels

## Analog Settings

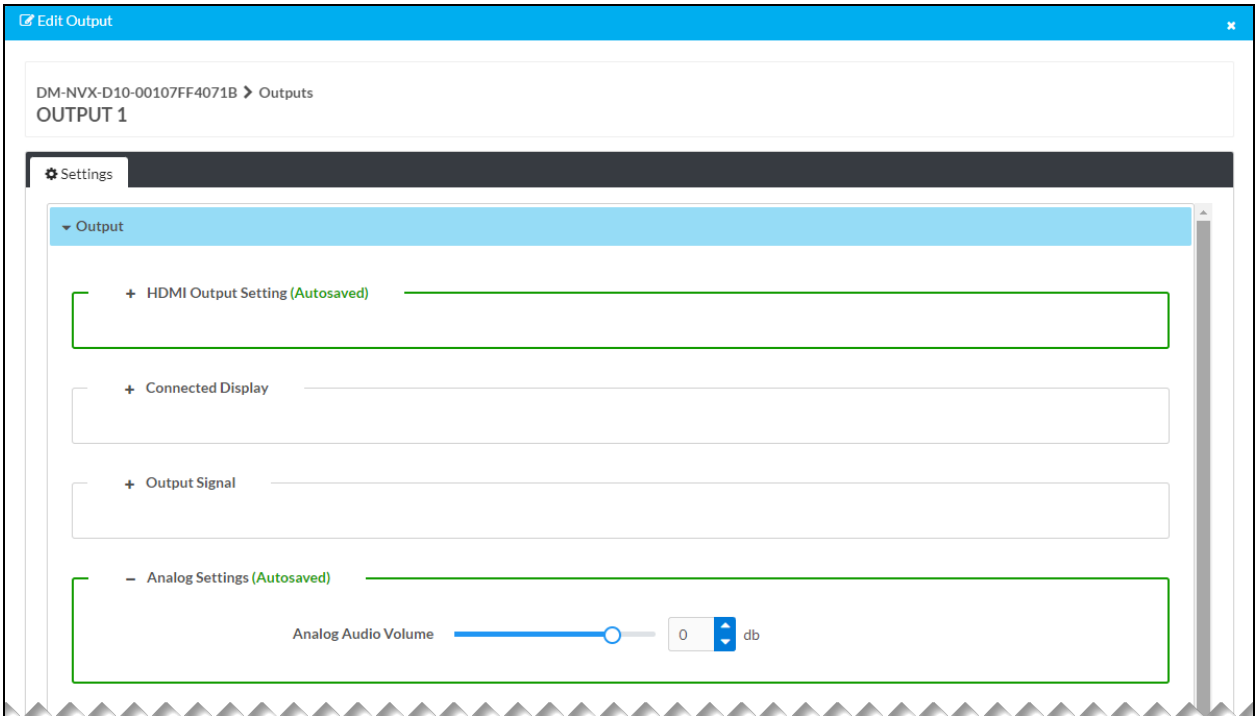
The analog audio output can provide a stereo line-level signal to feed a local sound system or sound bar.

> **NOTE:** The analog audio output is functional only when the encoder is receiving a 2-channel stereo input signal.

The **Analog Settings** section of the **Edit Output** dialog box enables the volume of the analog audio output to be changed.

> **NOTE:** When a change is made to the analog audio volume, the change is automatically saved.

### Edit Output Dialog Box - Analog Settings (Decoder Only)

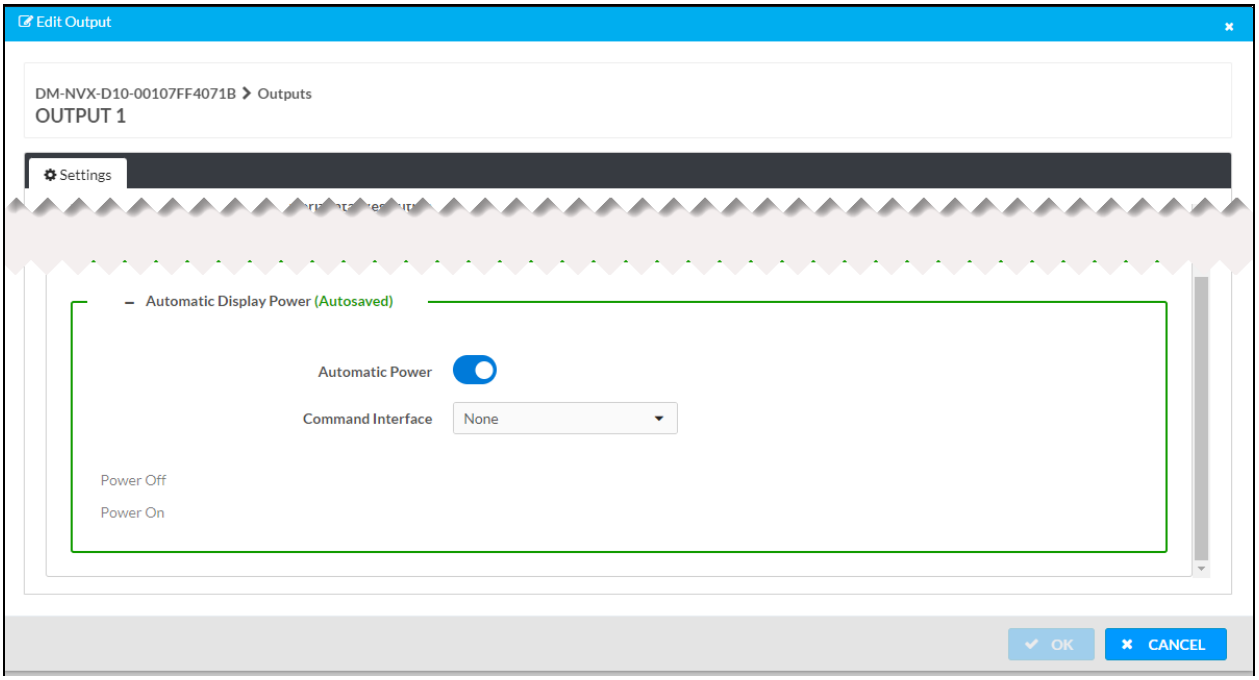



To change the analog audio volume, move the slider or use the scrollable text box to set the desired number of decibels (dB). Values range from **-80** to **24** dB. The default setting is **0** dB.

## Automatic Display Power

The **Automatic Display Power** section of the **Edit Output** dialog box enables the HDMI output to be configured so that the display device can be powered on or off automatically.

**Edit Output Dialog Box - Automatic Display Power (DM-NVX-D10 Only)**




Refer to the configuration guidelines that follow.

> **NOTE:** When a change is made to the **Automatic Display Power** section, the change is automatically saved.

**Automatic Power:** By default, **Automatic Power** is enabled (the toggle switch is set in the On position). To disable **Automatic Power**, set the toggle switch in the Off position.

If **Automatic Power** is enabled, configure the following settings:

- **Command Interface:** In the drop-down list, select one of the following:
  - **None:** (Default setting) Specifies that no command is to be sent
  - **CEC:** Specifies that a CEC command is to be sent via the HDMI output
  - **RS-232:** Specifies that an RS-232 command is to be sent via the COM port
  - **Infrared** Specifies that an IR command is to be sent via the IR port

> NOTES:
>
> - If **CEC** or **RS-232** is selected, error messages may appear in the **Power Off** and **Power On** sections indicating that one or more command strings are invalid. The messages are displayed until valid command strings are entered in the **Command** or **Command String** text boxes as applicable.

    - If **Infrared** is selected, an IR file (*.ir) must be loaded to the DM NVX device. For information about loading an IR file, refer to IR Port.

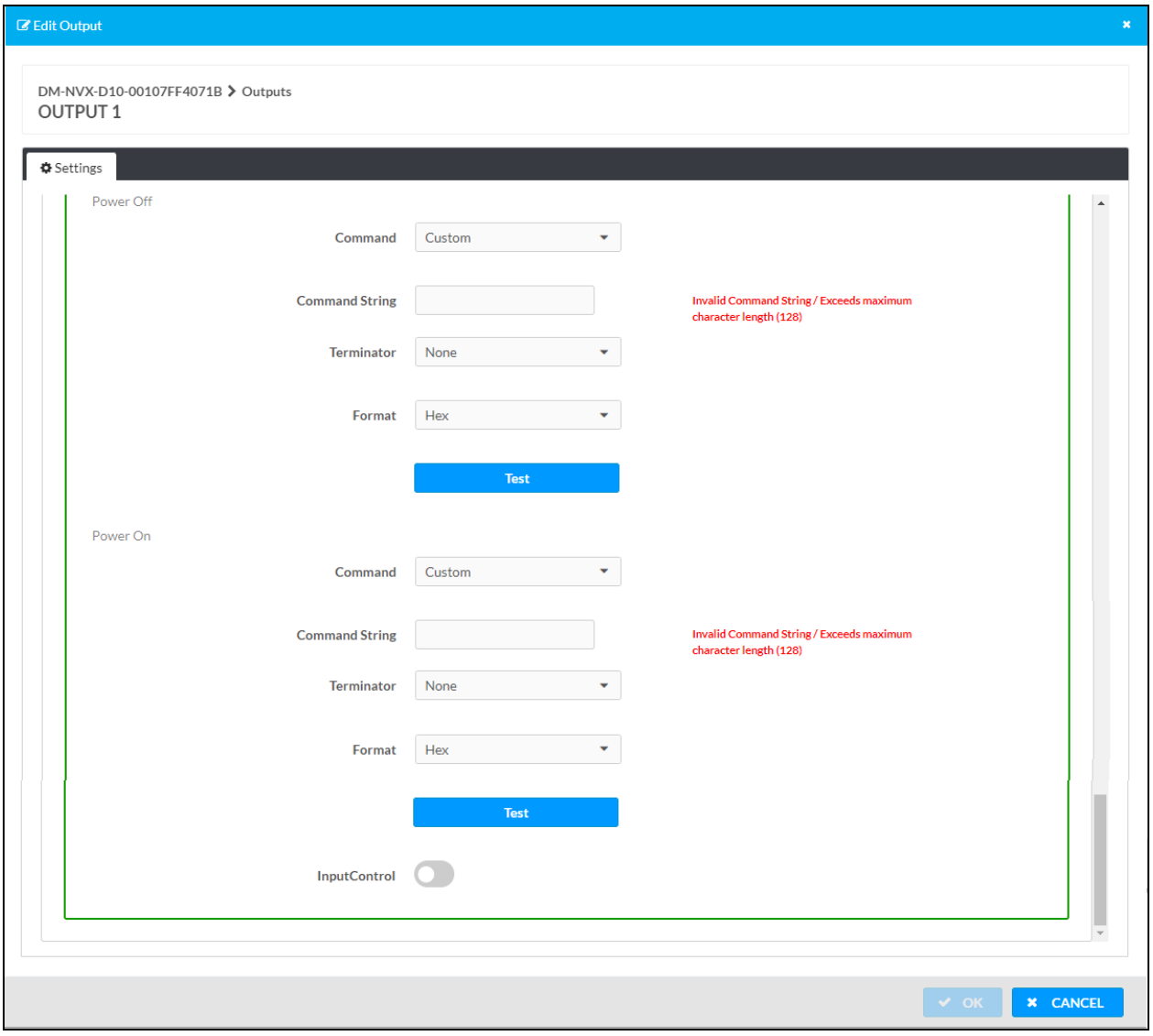
- **Active Port:** (Applicable when **Infrared** is selected as the command interface) **Port 1** is the only available selection for the active IR port.

For **CEC**, **RS-232**, and **Infrared** command interfaces, configure **Power Off** and **Power On** settings as applicable. Refer to the Power Off and Power On Using CEC, Power Off and Power On Using RS-232, and Power Off and Power On Using Infrared sections for information.

### Power Off and Power On Using CEC

When **CEC** is selected as the command interface, configure **Power Off** and **Power On** settings.

**CEC Power Off and Power On Configuration**




Refer to the configuration guidelines that follow.

- **Command:** Do the following as applicable:
  - For **Power Off** using **CEC**, select one of the following in the **Command** drop-down list:
    - **Power Off: RCP and SS** (Remote Control Passthrough and System Standby)
    - **Power Off: RCP Only**
    - **Power Off: SS Only**
    - **Custom** (default setting)

If a setting other than **Custom** is selected, click the **Test** button to test the command.

- For **Power On** using **CEC**, select one of the following in the **Command** drop-down list:
  - **Power On: RCP and IVO** (Remote Control Passthrough and Image View On)
  - **Power On: RCP**
  - **Power On: Image View On**
  - **Custom** (default setting)

If a setting other than **Custom** is selected, click the **Test** button to test the command.

- If **Custom** is selected as the command, configure the following:
  - **Command String:** In the text box, enter a valid command string for CEC. The maximum length is 128 characters.

    > **NOTE:** If the format of the command is to be selected as **Hex** in the **Format** drop-down list discussed below, the **Hex** command string must be entered as pairs of characters separated by a space. Valid characters are 0-9, a-f, and A-F. An example of a command string is as follows:
    >
    > 58 00 0D 0A

  - **Terminator:** In the drop-down list, select one of the following to append to the command:
    - **None:** No terminator (default setting)
    - **CR:** Carriage return
    - **LF:** Line feed
    - **CR_LF:** Carriage return followed by a line feed
  - **Format:** In the drop-down list, select **Hex** (hexadecimal) or **ASCII**. The default setting is **Hex**.

  Click the **Test** button to test the custom command.

- **Input Control:** (Applicable to **Power On** only) By default, **Input Control** is disabled (the toggle switch is set in the Off position). To enable **Input Control**, set the toggle switch in the On position.

  When enabled, **Input Control** allows an additional command to be sent after the **Power On** command is sent. The **Input Control** command ensures that the proper HDMI input is selected on the display device.

Configure **Input Control** as follows:

- **Delay:** In the drop-down list, select the number of seconds that must pass before the **Input Control** command can be sent after the **Power On** command is sent. Values are **0 seconds**, **3 seconds**, **5 seconds**, **7 seconds**, **10 seconds**, or **20 seconds**. The default setting is **5 seconds**.
- **Command String:** In the text box, enter a valid command string. The maximum length is 128 characters.

  > **NOTE:** If the format of the command is to be specified as **Hex** in the **Format** drop-down list discussed below, the **Hex** command string must be entered as pairs of characters separated by a space. Valid characters are 0-9, a-f, and A-F. An example of a command string is as follows:
  >
  > 58 00 0D 0A

- **Terminator:** In the drop-down list, select one of the following terminators to append to the command:
  - **None:** No terminator (default setting)
  - **CR:** Carriage return
  - **LF:** Line feed
  - **CR_LF:** Carriage return followed by a line feed
- **Format:** In the drop-down list, select **Hex** (hexadecimal) or **ASCII**. The default setting is **Hex**.

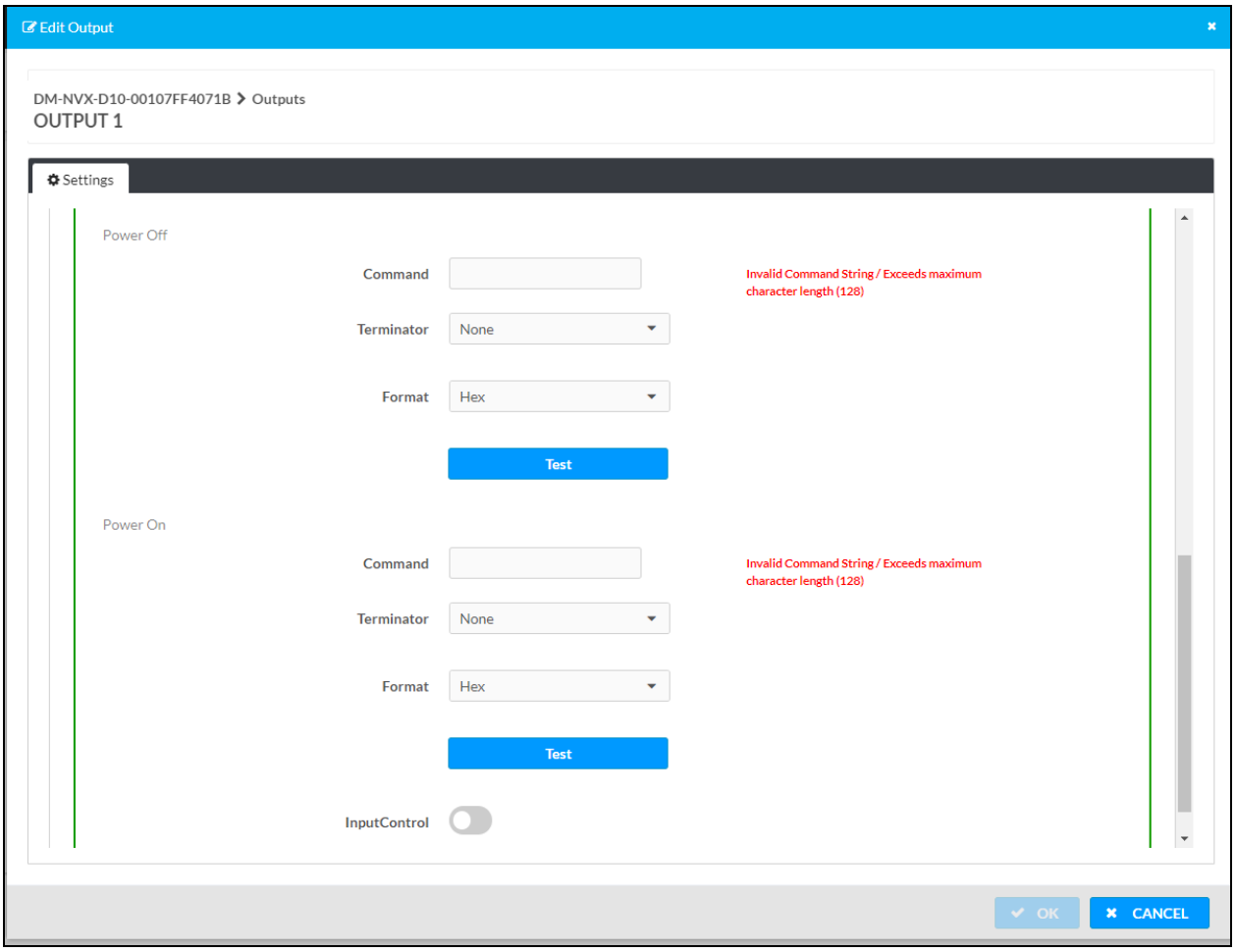
Click the **Test** button to test the **Input Control** command.

To close the **Edit Output** pop-up dialog box, click the **CANCEL** button at the bottom of the dialog box.

### Power Off and Power On Using RS-232

When **RS-232** is selected as the command interface, configure **Power Off** and **Power On** settings.

**RS-232 Power Off and Power On Configuration**




Refer to the configuration guidelines that follow.

- **Command:** In the text box, enter a valid command string for RS-232. The maximum length is 128 characters.

  > **NOTE:** If the format of the command is to be selected as **Hex** in the **Format** drop-down list discussed below, the Hex command string must be entered as pairs of characters separated by a space. Valid characters are 0-9, a-f, and A-F. An example of a command string is as follows:
  >
  > 58 00 0D 0A

- **Terminator:** In the drop-down list, select one of the following to append to the command:

- **None:** No terminator (default setting)
- **CR:** Carriage return
- **LF:** Line feed
- **CR_LF:** Carriage return followed by a line feed

- **Format:** In the drop-down list, select **Hex** (hexadecimal) or **ASCII**. The default setting is **Hex**.

  Click the **Test** button to test the command.

- **Input Control:** (Applicable to **Power On** only) By default, **Input Control** is disabled (the toggle switch is set in the Off position). To enable **Input Control**, set the toggle switch in the On position.

  When enabled, **Input Control** allows an additional command to be sent after the **Power On** command is sent. The Input Control command ensures that the proper RS-232 input is selected on the display device.

  Configure **Input Control** as follows:

  - **Delay:** In the drop-down list, select the number of seconds that must pass before the **Input Control** command can be sent after the **Power On** command is sent. Values are **0 seconds**, **3 seconds**, **5 seconds**, **7 seconds**, **10 seconds**, or **20 seconds**. The default setting is **5 seconds**.
  - **Command String:** In the text box, enter a valid command string. The maximum length is 128 characters.

    > **NOTE:** If the format of the command is to be specified as **Hex** in the **Format** drop-down list discussed below, the **Hex** command string must be entered as pairs of characters separated by a space. Valid characters are 0-9, a-f, and A-F. An example of a command string is as follows:
    >
    > 58 00 0D 0A

  - **Terminator:** In the drop-down list, select one of the following terminators to append to the command:
    - **None:** No terminator (default setting)
    - **CR:** Carriage return
    - **LF:** Line feed
    - **CR_LF:** Carriage return followed by a line feed
  - **Format:** In the drop-down list, select **Hex** (hexadecimal) or **ASCII**. The default setting is **Hex**.

    Click the **Test** button to test the **Input Control** command.

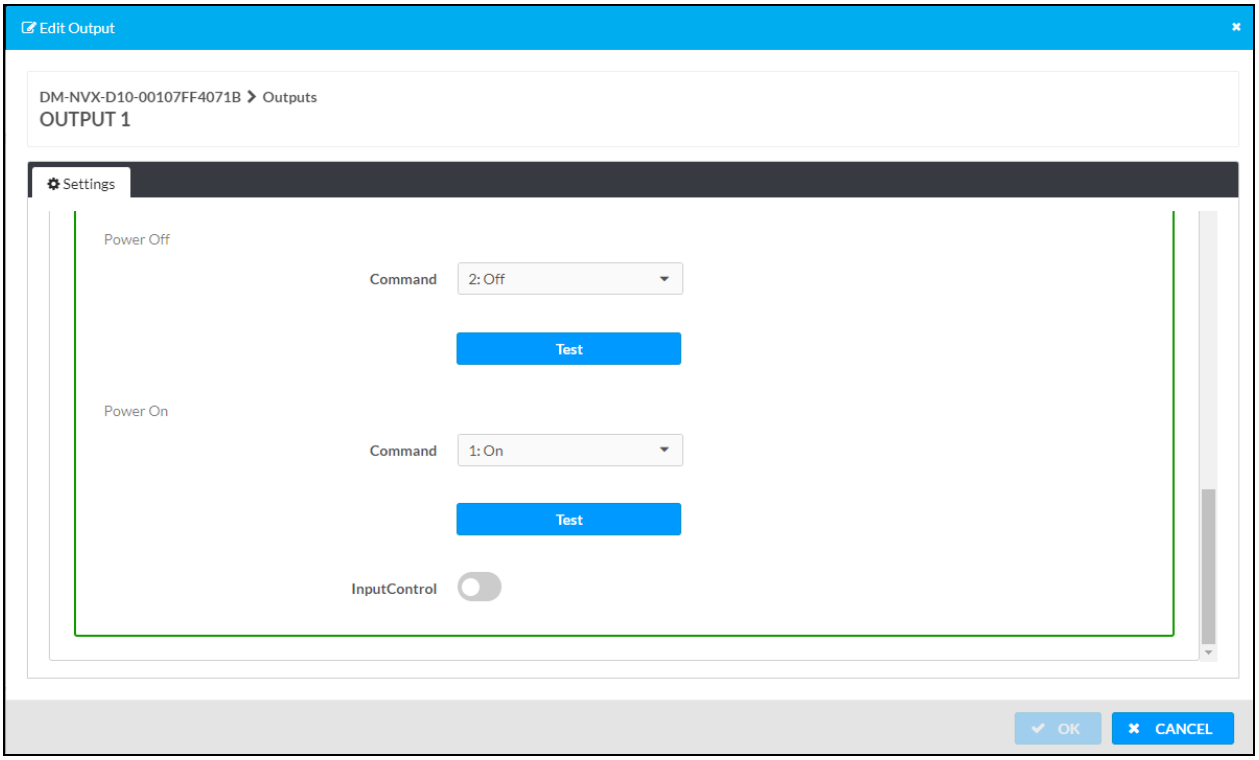
To close the **Edit Output** pop-up dialog box, click the **CANCEL** button at the bottom of the dialog box.

### Power Off and Power On Using Infrared

When **Infrared** is selected as the command interface, configure **Power Off** and **Power On** settings.

> **NOTE:** In order to configure **Power Off** and **Power On** settings for **Infrared**, an IR file must be loaded to the DM NVX device. Refer to IR Port for information about loading an IR file.

**Infrared Power Off and Power On Configuration (Shown with Sample IR File Loaded)**




Refer to the configuration guidelines that follow.

- **Command:** In the drop-down list, select the desired IR command.

  Click the **Test** button to test the command.

- **Input Control:** (Applicable to **Power On** only) By default, **Input Control** is disabled (the toggle switch is set in the Off position). To enable **Input Control**, set the toggle switch in the On position.

  When enabled, **Input Control** enables an additional command to be sent after the **Power On** command is sent. The Input Control command ensures that the proper IR input is selected on the display device.

Configure **Input Control** as follows:

- **Delay:** In the drop-down list, select the number of seconds that must pass before the Input Control command can be sent after the **Power On** command is sent. Values are **0 seconds**, **3 seconds**, **5 seconds**, **7 seconds**, **10 seconds**, or **20 seconds**. The default setting is **5 seconds**.
- **Command:** In the drop-down list, select the desired **Input Control** command.

  Click the **Test** button to test the Input Control command.

To close the **Edit Output** pop-up dialog box, click the **CANCEL** button at the bottom of the dialog box.

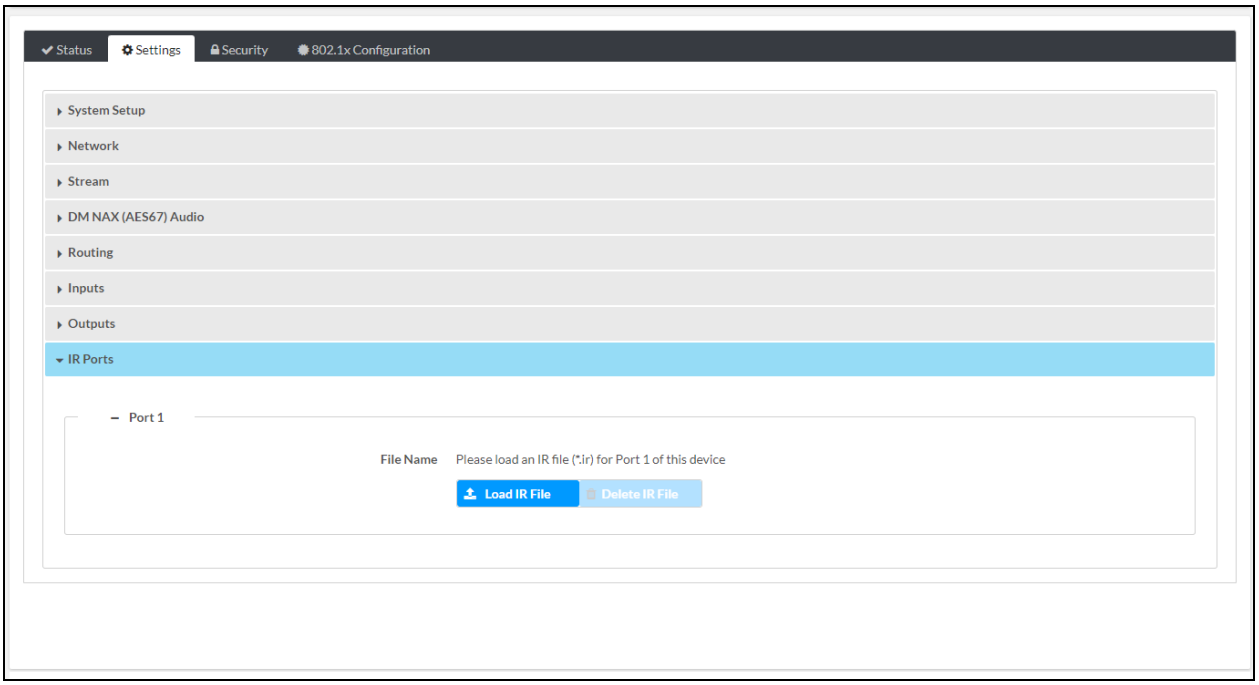
# IR Port

In order for the IR port (Port 1) to be functional, an IR file (*.ir) must be loaded to the DM NVX device. The IR file defines all IR signals that are to be available on the device.

To load or delete an IR file, open the **IR Ports** section of the **Settings** tab.

> **NOTE:** For example purposes, the DM-NVX-E10 **Settings** tab is shown in the following screen.

**Settings Tab - IR Ports**

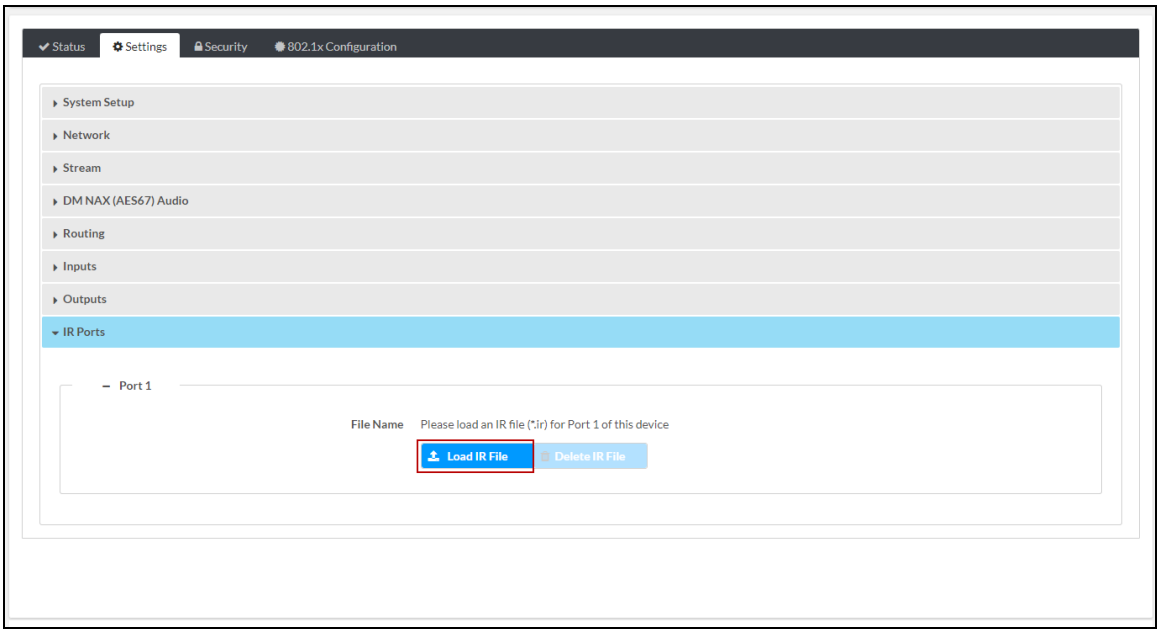


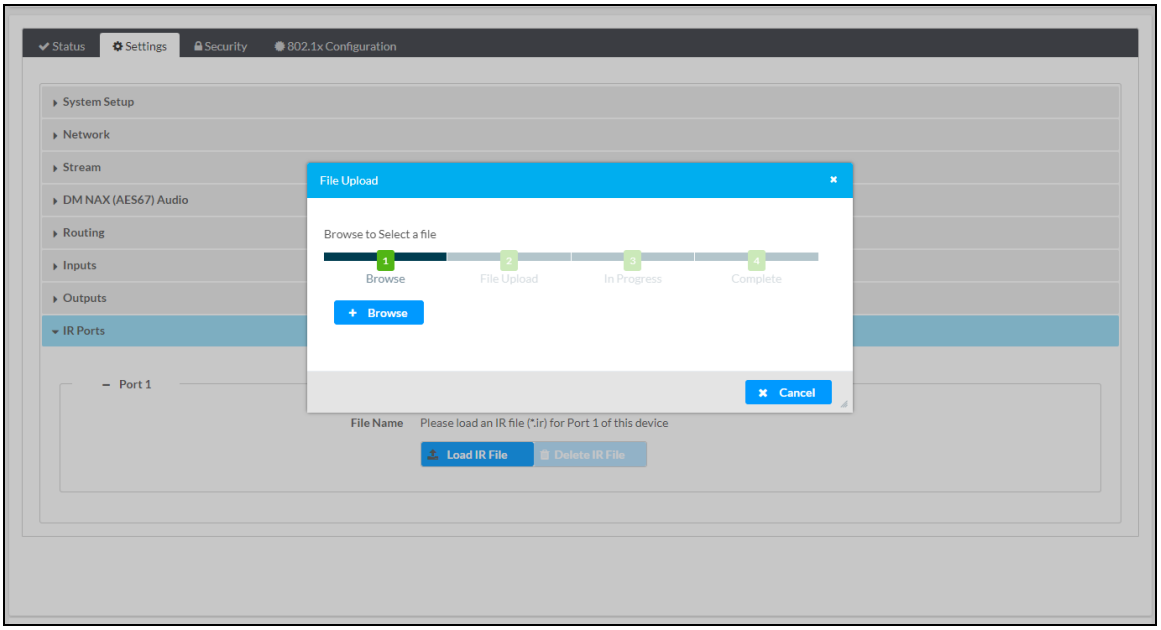
## Loading an IR File

In the **IR Ports** section of the **Settings** tab, load an IR file by doing the following:

1. Click the **Load IR File** button.

**Settings Tab, IR Ports - Load IR File**



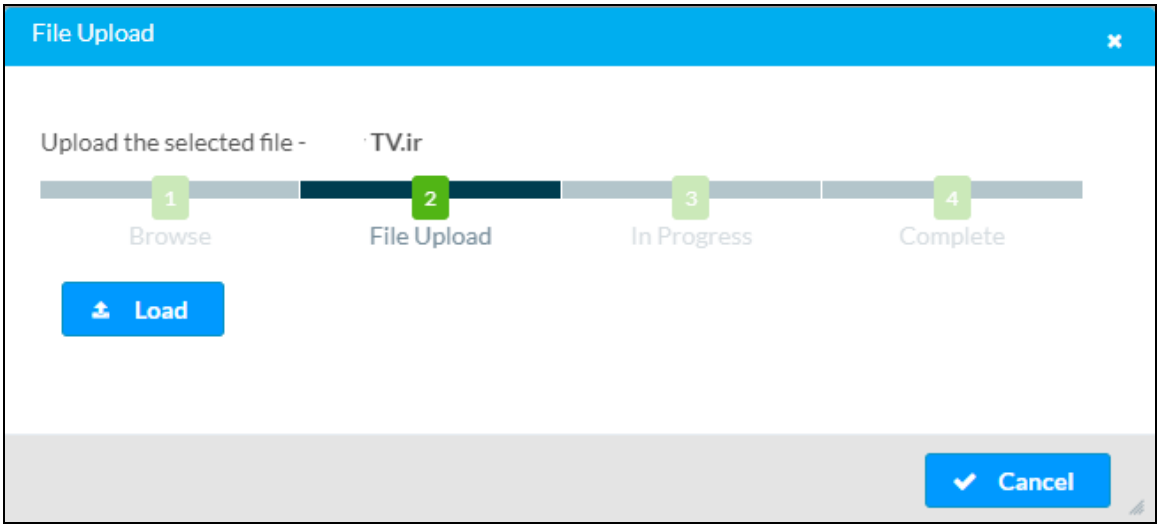




2. Click **Browse**. File Explorer opens.
3. Navigate to the desired IR file (*.ir), select the file, and then click **Open**.

**NOTE:** If a file other than an *.ir file is selected, a message appears indicating that the selected file is an invalid file type. Select a valid IR file.

The **File Upload - Load** dialog box opens.

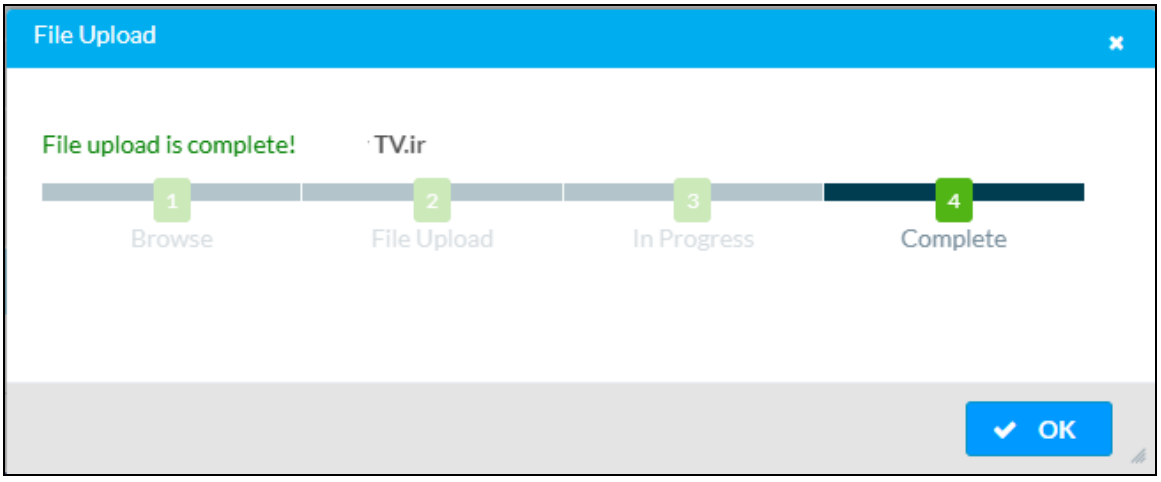
**File Upload - Load Dialog Box**




4. Click **Load**.

   When the file upload process is complete, the **File upload is complete** message appears in the **File Upload - Complete** dialog box.

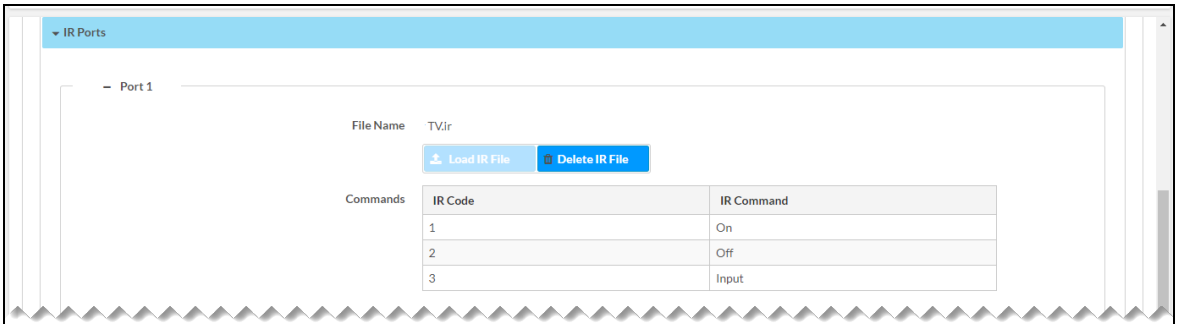
   **File Upload - Complete Dialog Box**




5. Click **OK** to close the dialog box and return to the **IR Ports** section of the **Settings** tab.

   The IR file name is displayed and the IR commands are listed in the **Commands** table as shown in the example below. Up to 10 commands can be listed simultaneously. If more than 10 commands exist, press the scroll arrows to scroll through the commands.

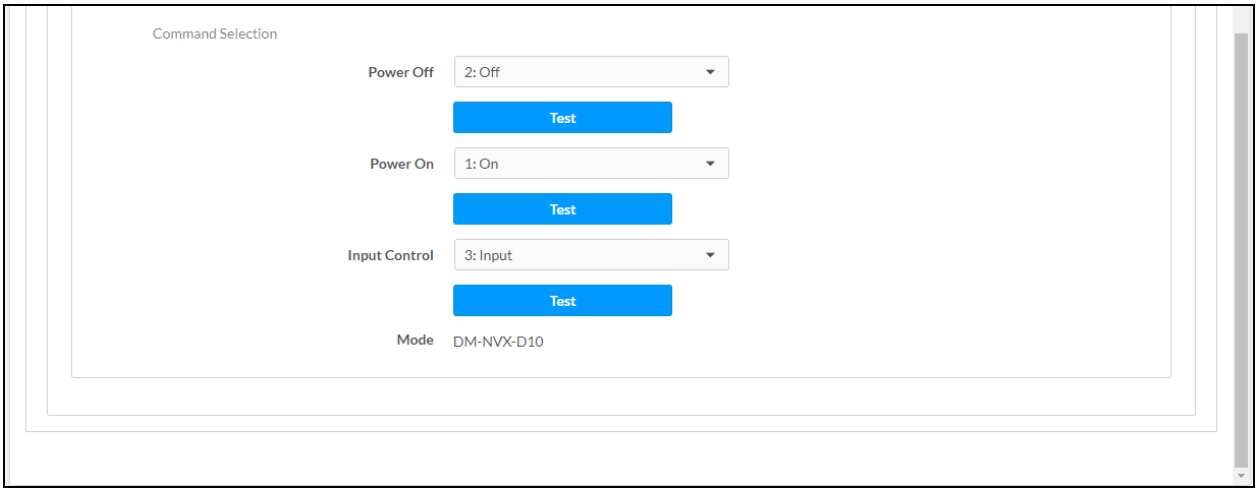
IR Command List Example




## Command Selection

An example of the **Command Selection** section is shown below.

Command Selection Example




In the **Command Selection** section, select the desired command for the following:

- **Power Off:** In the drop-down list, select the desired IR command to power off the display.

  Click the **Test** button to test the command.
- **Power On:** In the drop-down list, select the desired IR command to power on the display.

  Click the **Test** button to test the command.
- **Input Control:** In the drop-down list, select the desired IR command that is to be used to select the required input.

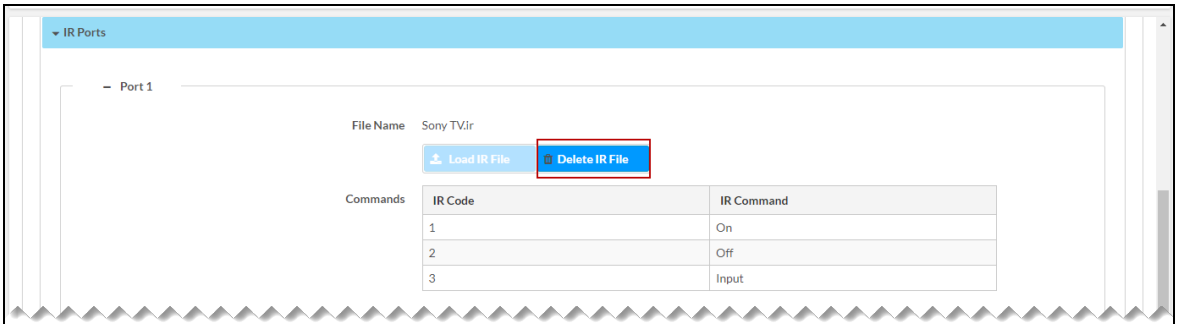
  Click the **Test** button to test the command.
- **Model:** Indicates the model name of the DM NVX device.

## Deleting an IR File

In the **IR Ports** section of the **Settings** tab, delete an IR file by doing the following:

1. Click the **Delete IR File** button.

   **Settings Tab, IR Ports - Delete IR File**

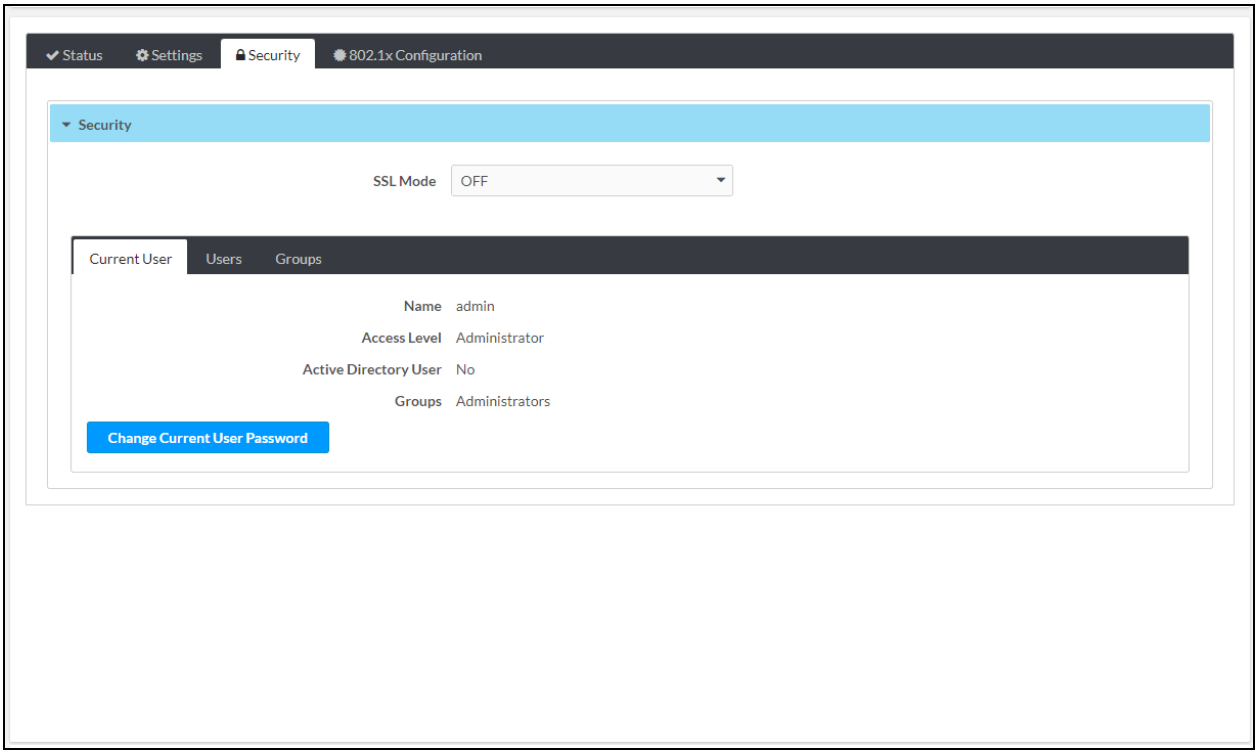
   A prompt appears asking for confirmation that the IR file be deleted.

2. Click **Yes**. The IR file is deleted.

# Configuring Security Settings

Click the **Security** tab to configure SSL (Secure Sockets Layer) mode and authentication management settings.

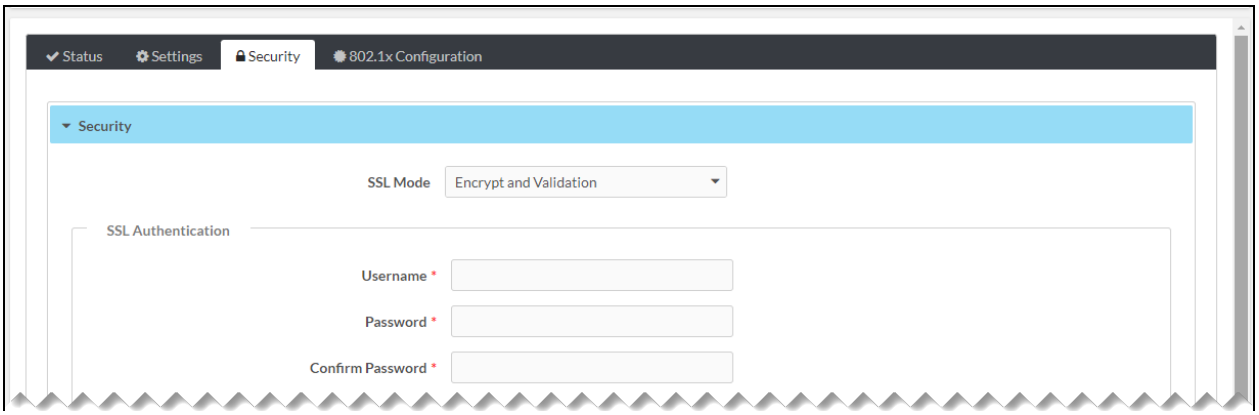
**Security Tab**



# SSL Mode

SSL mode can be disabled or enabled. When enabled, SSL encryption, validation, or both can be set.

**Security Tab - SSL Mode (Encrypt and Validation Selection Shown)**




In the **SSL Mode** drop-down list, select one of the following:

- **Encrypt and Validation:** Specifies both encryption and validation and enables configuration of SSL authentication in the following text boxes:
  - **Username:** Enter the desired username.
  - **Password:** Enter the desired password.
  - **Confirm Password:** Reenter the password for confirmation.
- **Encrypt:** Specifies encryption only and enables configuration of SSL authentication in the following text boxes:
  - **Username:** Enter the desired username.
  - **Password:** Enter the desired password.
  - **Confirm Password:** Reenter the password for confirmation.
- **OFF:** (Default setting) Specifies no SSL connection

# Authentication Management

Authentication management can be configured for users and groups including Active Directory® credential management groups. Predefined access levels can also be assigned.

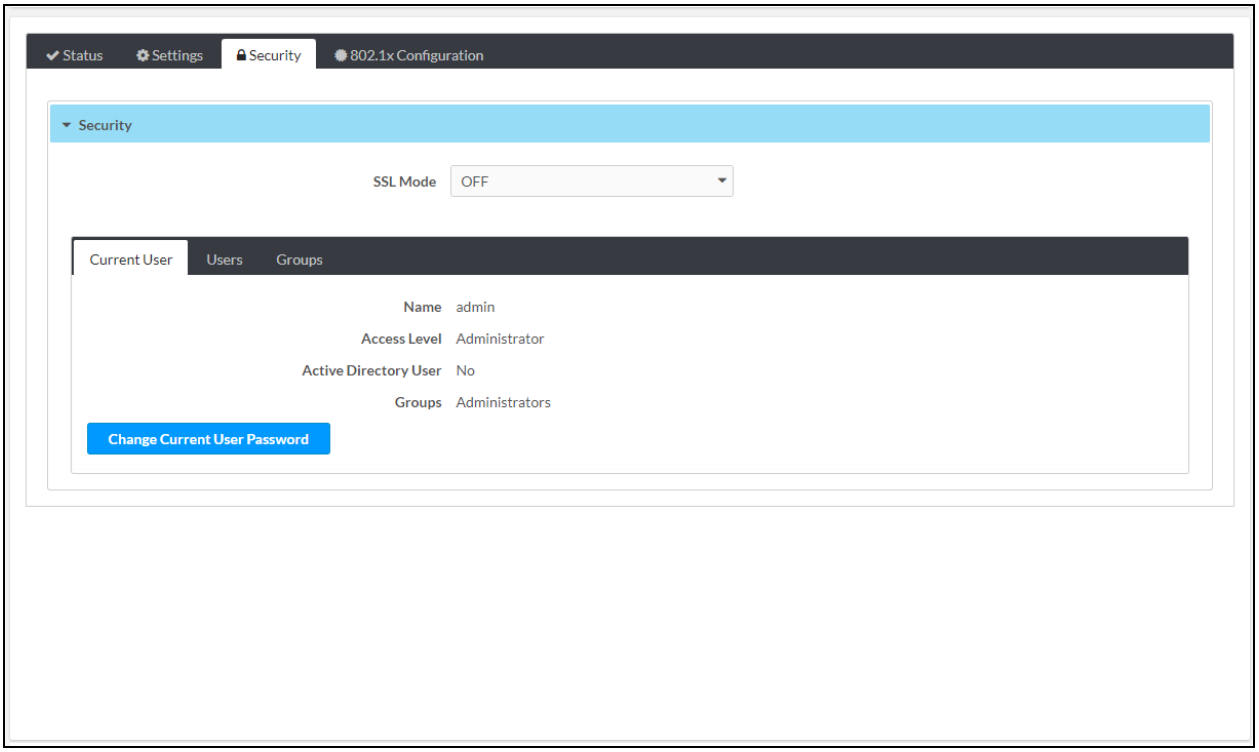
The following authentication management tabs are provided:

- Current User (refer to Managing Current User Authentication for information)
- Users (refer to Managing User Authentication for information)
- Groups (refer to Managing Group Authentication for information)

## Managing Current User Authentication

By default, the **Current User** tab is displayed when the **Security** tab opens. The **Current User** tab enables information about the current user to be viewed. In addition, the user password can be changed if necessary.

**Security Tab, Current User Tab**

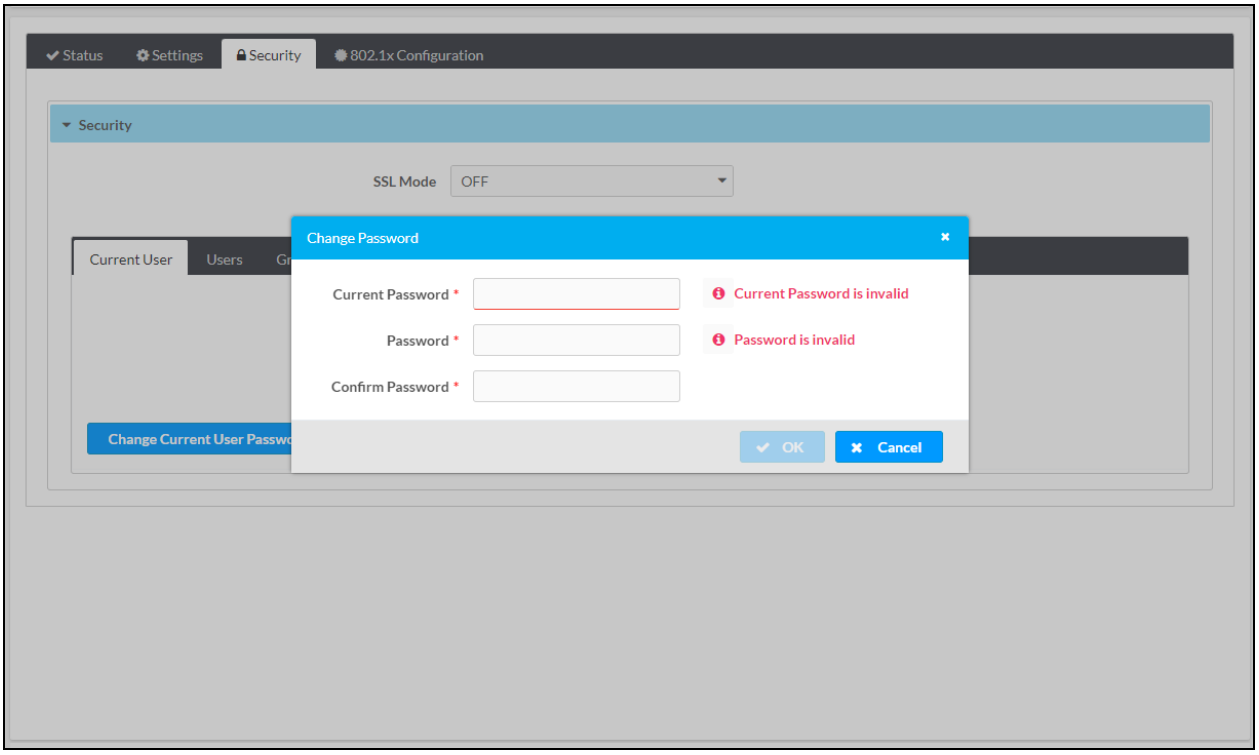



The **Current User** tab displays the following information:

- **Name:** Indicates the username
- **Access Level:** Indicates the access level of the current user: **Administrator, Programmer, Operator, User, or Connect**
- **Active Directory User:** Indicates whether the current user is authenticated using Active Directory credential management: **Yes** or **No**
- **Groups:** Indicates the groups to which the current user is a member

To change the password of the current user, click the **Change Current User Password** button. The **Change Password** pop-up dialog box opens.

### Change Password Pop-Up Dialog Box




Enter the following information into the corresponding text boxes:

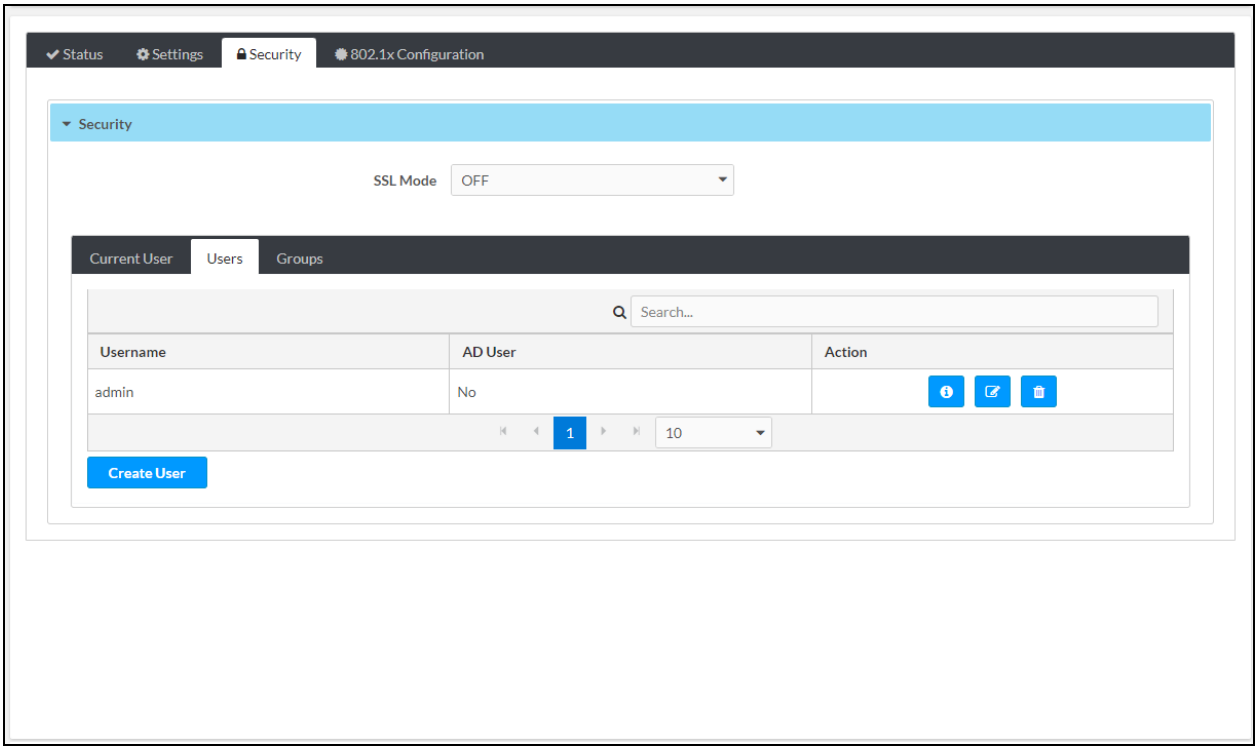
- **Current Password:** Enter the current password.
- **Password:** Enter a new password using a minimum of 8 characters. The password is case sensitive.
- **Confirm Password:** Reenter the new password for confirmation.

Click **OK** to save the new password and close the dialog box.

## Managing User Authentication

Click the **Users** tab to view information about all users, to update user information, to delete a user, or to add a user.

**Security Tab, Users Tab**




The **Users** tab provides a table that displays the following information about each user:

- **Username:** Indicates the username
- **AD User:** Indicates whether the user is authenticated using Active Directory credential management: **Yes** or **No**

By default, up to 10 users can be displayed in the table simultaneously. To change the default setting, select the desired number in the drop-down list at the bottom of the table. The number of users can be set to **5**, **10** (default setting), or **20**. If the number of users exceeds the number to be displayed simultaneously, do either of the following to locate additional users:

- Use the Search box above the table.
- Use the scroll arrows at the bottom of the table to navigate through the list of users.

The **Action** column of the Users table enables the following actions to be performed:

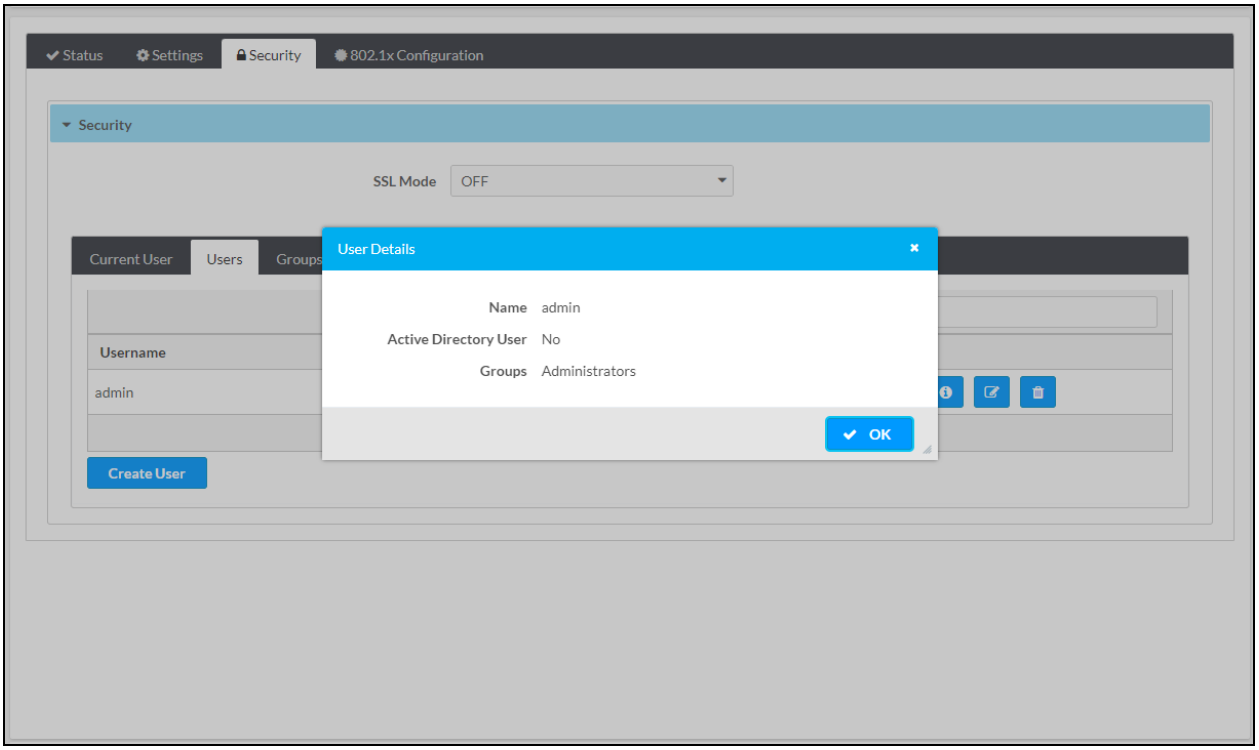
- View user details
- Update user information
- Delete a user

To add a user, refer to Create a User for information.

## View User Details

In the **Action** column of the Users table, click the Information icon ( ) to view details about a particular user listed in the table. The **User Details** pop-up dialog box opens.

**Security Tab, Users Tab - User Details Pop-Up Dialog Box**




The **User Details** pop-up dialog box displays the following information:

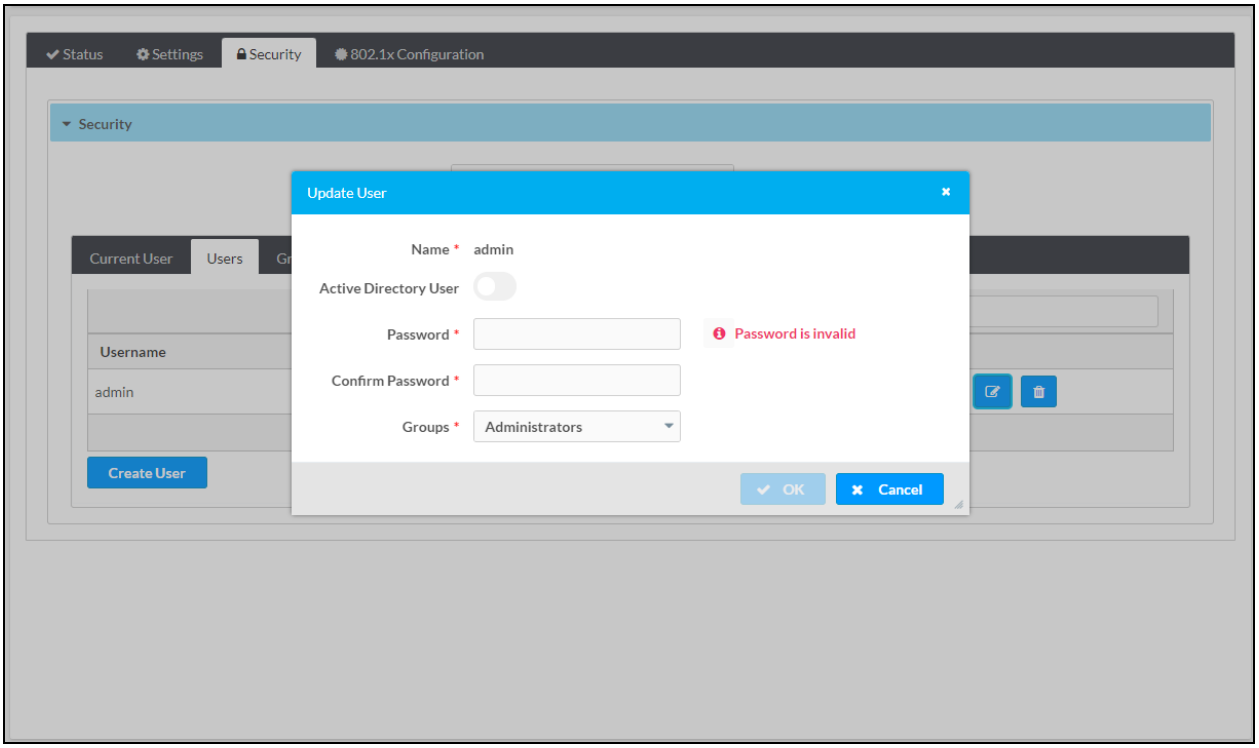
- **Name:** Indicates the username
- **Active Directory User:** Indicates whether the user is authenticated using Active Directory credential management: **Yes** or **No**
- **Groups:** Indicates the groups to which the user is a member

Click **OK** to close the dialog box.

## Update User Information

In the **Action** column of the **Users** table, click the Edit icon ( ) to update information about a particular user listed in the table. The **Update User** pop-up dialog box opens.

**Security Tab, Users Tab - Update User Pop-Up Dialog Box**




The **Update User** pop-up dialog box displays the username and whether Active Directory credential management is enabled for the user.

Update user information in the corresponding text boxes as follows:

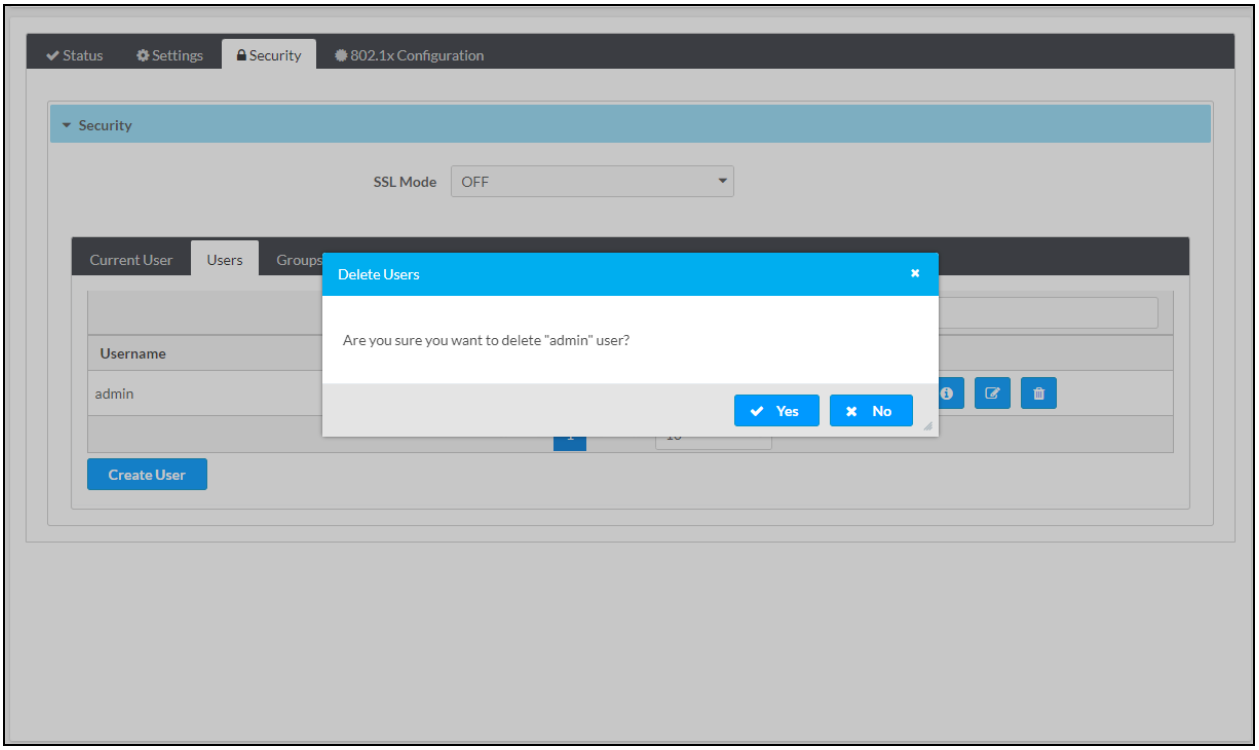
- **Password:** (Applicable when **Active Directory User** credential management is disabled) Enter a new password.
- **Confirm Password:** (Applicable when **Active Directory User** credential management is disabled) Reenter the new password for confirmation.
- **Groups:** In the drop-down list, select one or more groups to which the user is to be a member. Available selections are as follows: **Select All**, **Administrators**, **Connects**, **Operators**, **Programmers**, and **Users**. The list of groups also includes any groups created in the **Groups** tab (refer to Create a Group for information). Clicking **Select All** selects all groups. To search for a group, enter the name of the group in the search box, and then select the check box for the desired group.

To save the changes, click **OK**. The dialog box closes.

## Delete a User

In the **Action** column of the **Users** table, click the Trash icon ( ) to delete a user listed in the table. The **Delete Users** pop-up dialog box opens, prompting for confirmation that the user be deleted.

**Security Tab, Users Tab - Delete Users Pop-Up Dialog Box**

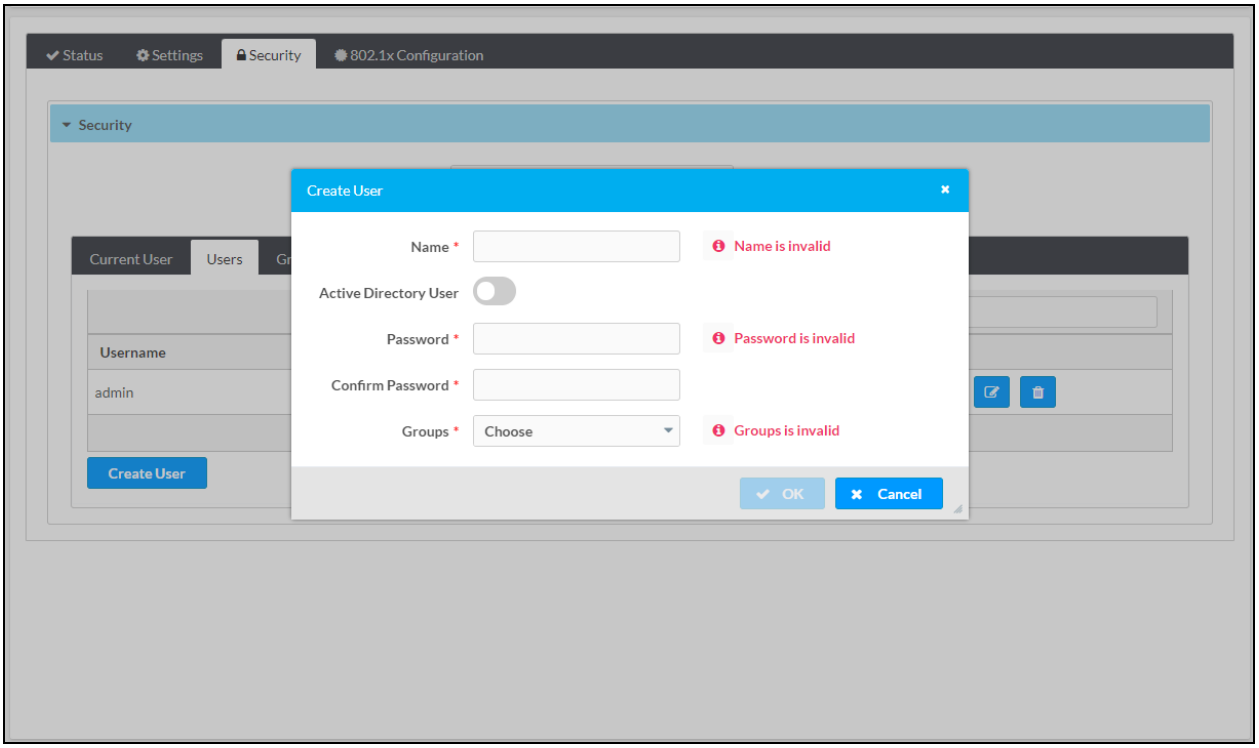



To delete the user, click **Yes**. The dialog box closes.

## Create a User

In the **Users** tab, click the **Create User** button to add a user. The **Create User** pop-up dialog box opens.

**Security Tab, Users Tab - Create User Pop-Up Dialog Box**




Create a user as follows:

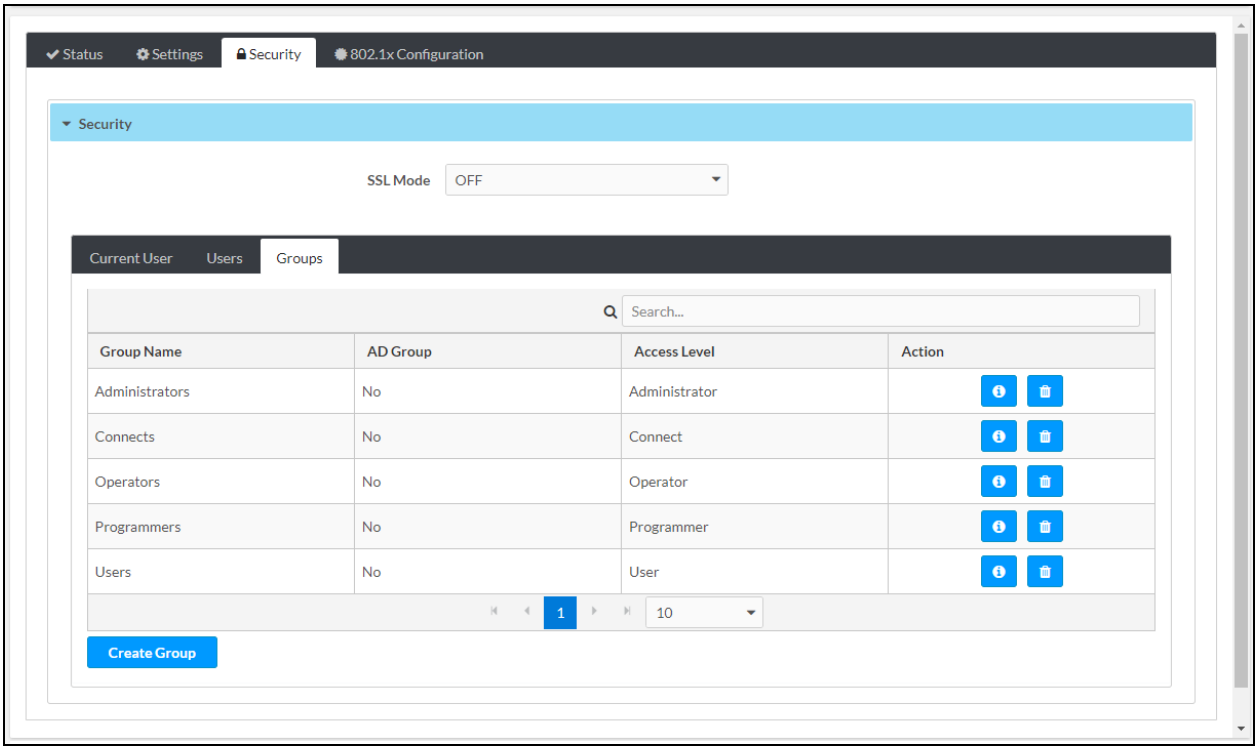
- **Name:** Enter the username.
- **Active Directory User:** By default, **Active Directory User** credential management is disabled (the toggle switch is set in the Off position). To enable **Active Directory User**, set the toggle switch in the On position.
- **Password:** (Applicable when **Active Directory User** credential management is disabled) Enter a password for the user.
- **Confirm Password:** (Applicable when **Active Directory User** credential management is disabled) Reenter the password for confirmation.
- **Groups:** In the drop-down list, select one or more groups to which the user is to be a member. Default selections are as follows: **Select All**, **Administrators**, **Connects**, **Operators**, **Programmers**, and **Users**. The list of groups also includes any groups created in the Groups tab (refer to Create a Group for information). Clicking **Select All** selects all groups. To search for a group, enter the name of the group in the search box, and then select the check box for the desired group.

To save the changes, click **OK**. The dialog box closes.

## Managing Group Authentication

Groups are used to group users based on access level and Active Directory credential management settings. Click the **Groups** tab to view information about all groups, to delete a group, or to add a group.

**Security Tab, Groups Tab**




The **Groups** tab provides a table that displays the following information about each group:

- **Group Name:** Indicates the name of the group. Default group names are **Administrators**, **Connects**, **Operators**, **Programmers**, and **Users**.
- **AD Group:** Indicates whether the group is authenticated using Active Directory credential management: **Yes** or **No**
- **Access Level:** Indicates the access level of the group: **Administrator**, **Connect**, **Operator**, **Programmer**, or **User**.

By default, up to 10 groups can be displayed in the table simultaneously. To change the default setting, select the desired number in the drop-down list at the bottom of the table. The number of groups can be set to **5**, **10** (default setting), or **20**. If the number of groups exceeds the number to be displayed simultaneously, do either of the following to locate additional groups:

- Use the Search box above the table.
- Use the scroll arrows at the bottom of the table to navigate through the list of groups.

The **Action** column of the Groups table enables the following actions to be performed:

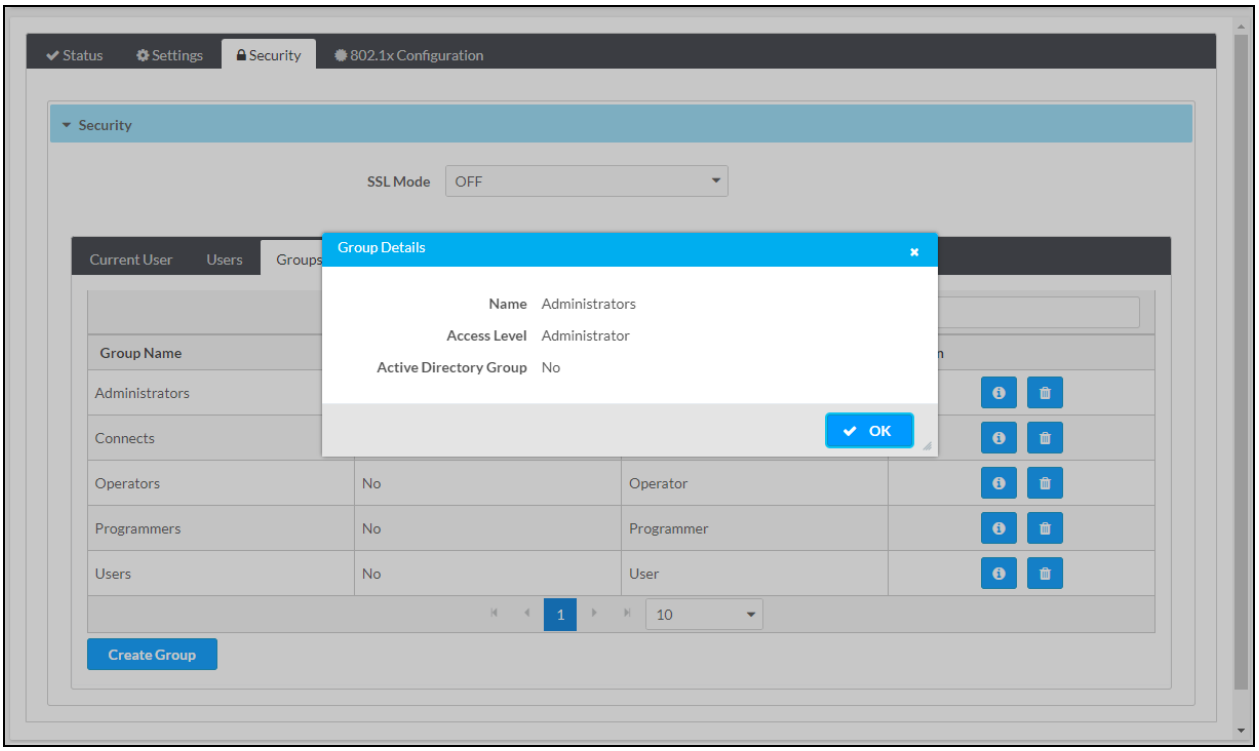
- View group details
- Delete a group

To add a group, refer to Create a Group for information.

## View Group Details

In the **Action** column of the Groups table, click the Information icon ( ) to view details about a particular group listed in the table. The **Group Details** pop-up dialog box opens.

**Security Tab, Groups Tab - Group Details Pop-Up Dialog Box**




The **Group Details** pop-up dialog box displays the following information:

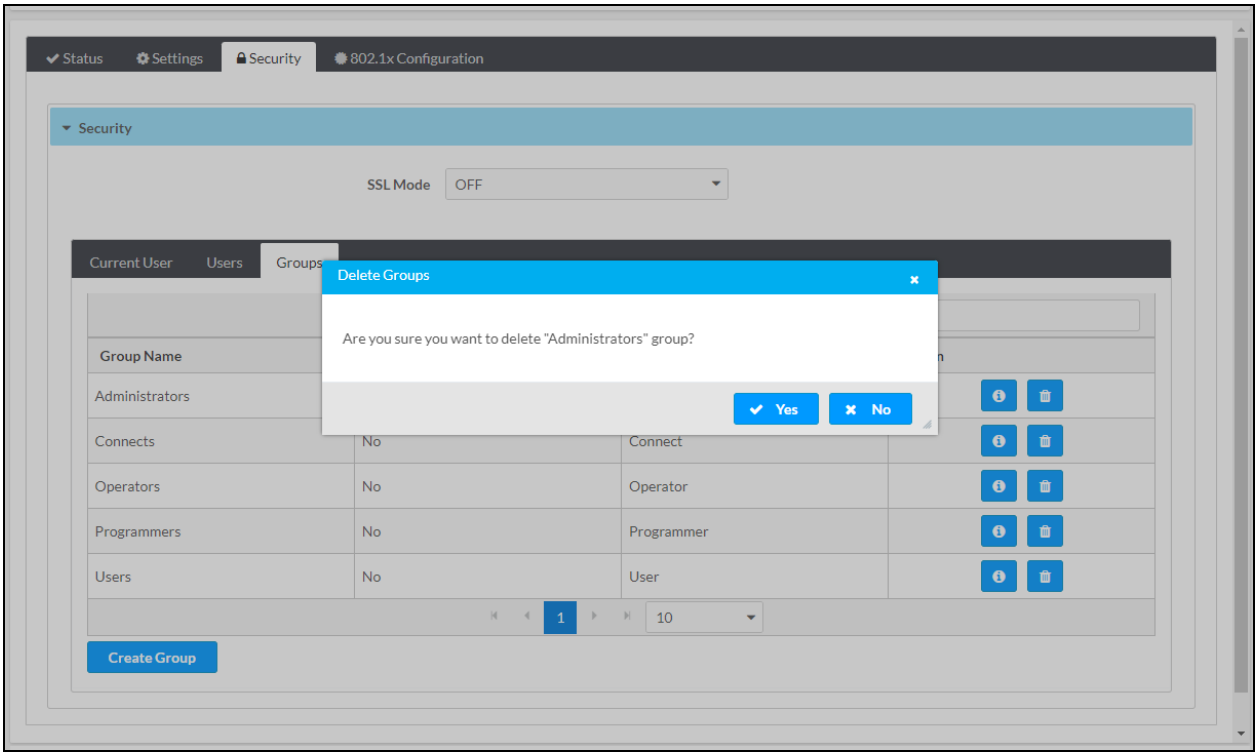
- **Name:** Indicates the name of the group
- **Access Level:** Indicates the access level of the group
- **Active Directory Group:** Indicates whether the group is authenticated using Active Directory credential management: **Yes** or **No**

Click **OK** to close the dialog box.

## Delete a Group

In the **Action** column of the **Groups** table, click the Trash icon ( ) to delete a group listed in the table. The **Delete Groups** pop-up dialog box opens, prompting for confirmation that the group be deleted.

**Security Tab, Groups Tab - Delete Groups Pop-Up Dialog Box**

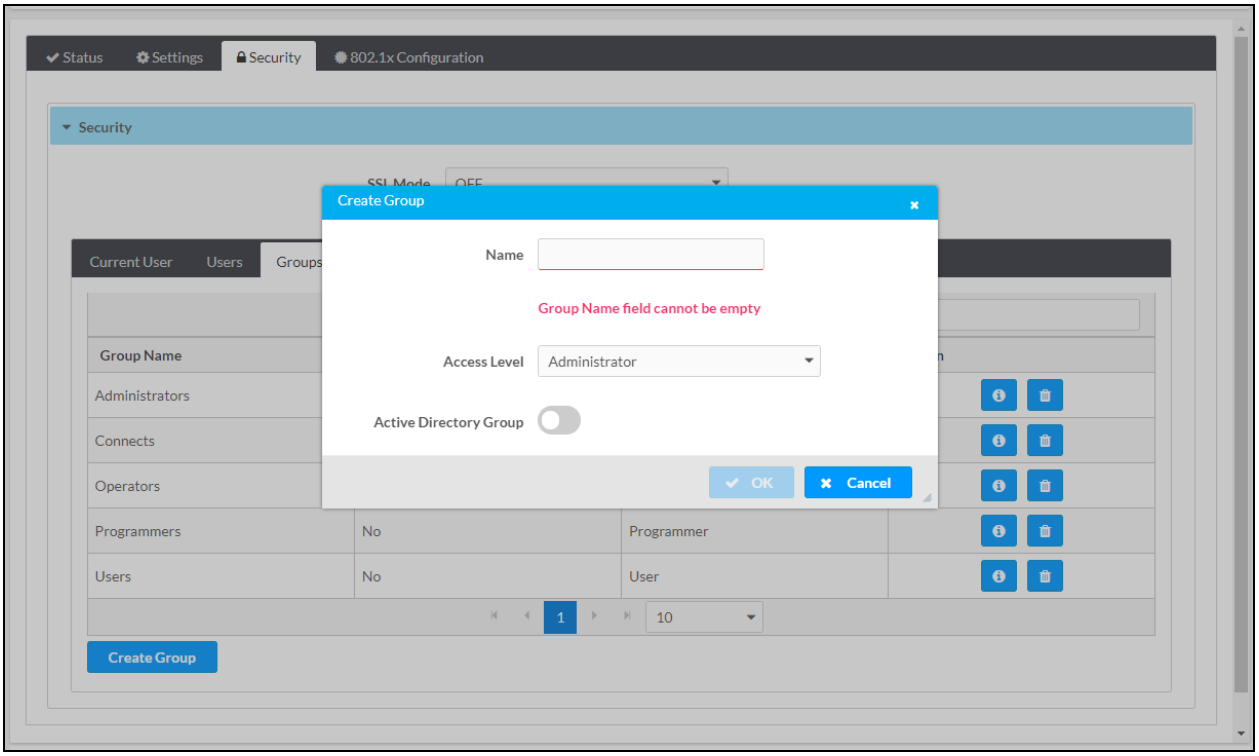



To delete the group, click **Yes**. The dialog box closes.

## Create a Group

In the **Groups** tab, click the **Create Group** button to add a group. The **Create Group** pop-up dialog box opens.

**Security Tab, Groups Tab - Create Group Pop-Up Dialog Box**




Add a group as follows:

- **Name:** Enter the name of the group.
- **Access Level:** In the drop-down list, select one of the following access levels: **Administrator**, **Connect**, **Operator**, **Programmer**, or **User**.
- **Active Directory Group:** By default, **Active Directory Group** is disabled (the toggle switch is set in the Off position). To enable **Active Directory Group**, set the toggle switch in the On position.

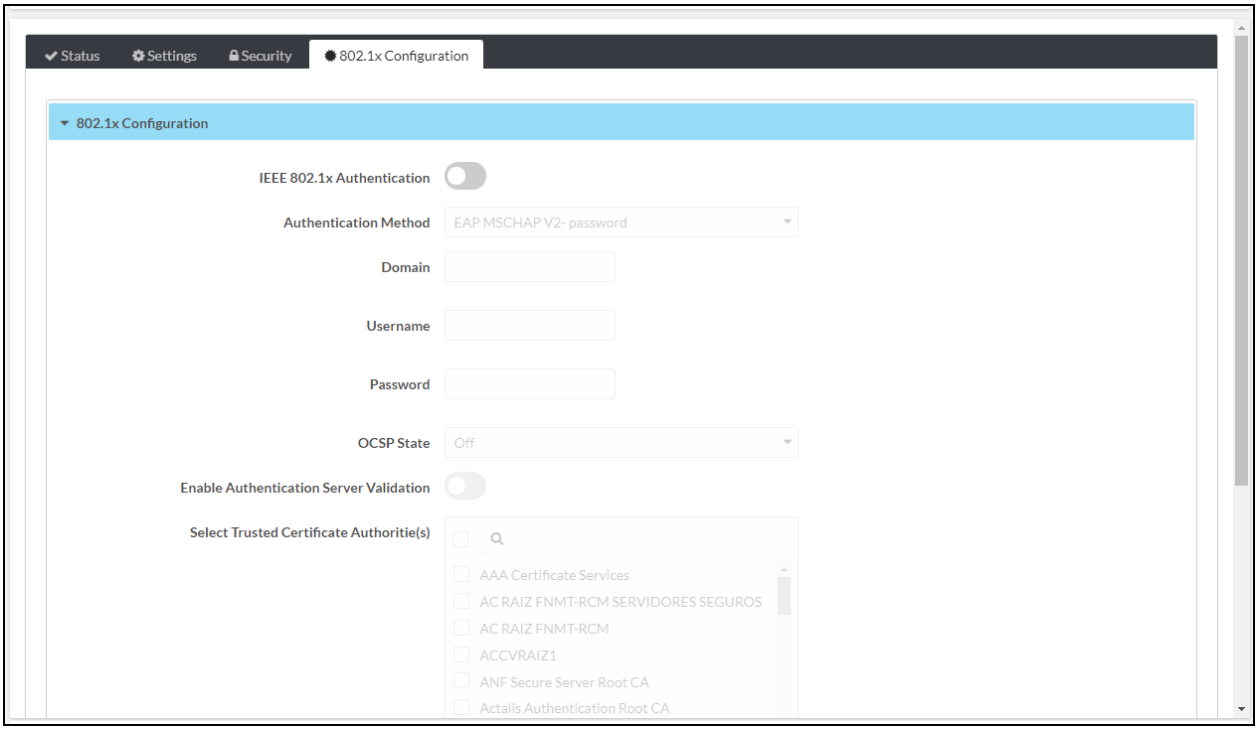
To save the changes, click **OK**. The dialog box closes.

# Configuring IEEE 802.1X Settings

> **NOTE:** If required, add trusted root certificates prior to selection of certificates in the **802.1x Configuration** tab. To do so, refer to Managing Certificates for information.

Click the **802.1x Configuration** tab to configure IEEE 802.1X network authentication.

**802.1x Configuration Tab**




Refer to the configuration guidelines that follow.

**IEEE 802.1x Authentication:** By default, IEEE 802.1X authentication is disabled (the toggle switch is set in the Off position) and cannot be configured.

To enable IEEE 802.1X authentication, set the toggle switch in the On position and configure the following parameters:

- **Authentication Method:** In the drop-down list, select one of the following as required by the network administrator: **EAP MSCHAP V2-password** or **EAP-TLS Certificate**. The default setting is **EAP MSCHAP V2-password**.

  Configure the following:

  - **Domain:** (Optional, applicable only when **EAP MSCHAP V2-password** is selected as the authentication method) Enter the domain name that is to be used for authentication.

- **Username:** (Required, applicable only when **EAP MSCHAP V2-password** is selected as the authentication method) Enter the username that is to be used for authentication.
- **Password:** (Required, applicable only when **EAP MSCHAP V2-password** is selected as the authentication method) Enter the password that is to be used for authentication.
- **OSCP State:** In the drop-down list, select one of the following:
  - **Optional:** If stapled OSCP information is provided by a certificate, it will be verified; however, stapled OSCP information is not required.
  - **Required:** Stapled OSCP information is required for the server certificate.
  - **All:** Stapled OCSP information is required for the server certificate and also for intermediate certificates that are not in the trust list.
  - **Off:** (Default setting) Disables OSCP verification

- **Enable Authentication Server Validation:** By default, **Enable Authentication Server Validation** is disabled (the toggle switch is set in the Off position). To enable server validation for increased security, set the toggle switch in the On position.
- **Select Trusted Certificate Authoritie(s):** (Applicable when **Enable Authentication Server Validation** is enabled)

  > **NOTE:** The DM NVX device provides a list of preloaded trusted root certificates from the Trusted Root Certification Authorities (CAs) certificate store. If required, additional root certificates can be uploaded to the DM NVX device (refer to Managing Root Certificates for information).

  In the CA selection box, select one or more trusted CAs as follows:

  - To select all CAs simultaneously, select the check box to the left of the search box.
  - To select one or more CAs on an individual basis, do either of the following:
    - Scroll for the desired CAs and select the corresponding check boxes.
    - Use the search box and select the check boxes for the desired CAs.

# Management

Management functions include the following:

- Rebooting the device
- Restoring factory default settings
- Updating firmware
- Downloading device logs
- Managing certificates
- Managing EDIDs (encoder only)

# Rebooting the Device

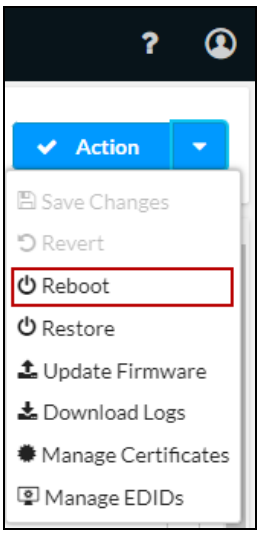
This section provides information about rebooting the device by using the web interface or the **RESET** button.

## Using the Web Interface

To reboot the device by using the web interface:

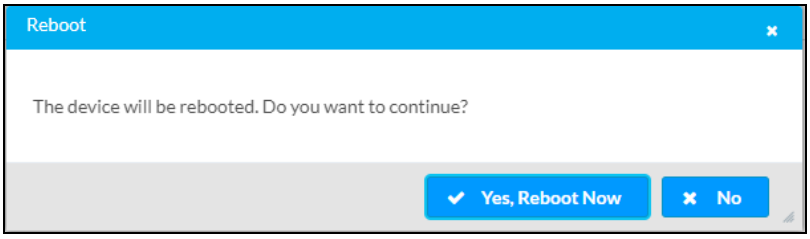
1. In the **Action** menu located in the upper-right corner of the web interface, click **Reboot**.

   **Action Menu - Reboot**

   The **Reboot** pop-up dialog box opens, prompting for confirmation that the device be rebooted.

Action Menu - Reboot, Reboot Pop-Up Dialog Box




2. Click the **Yes, Reboot Now** button to reboot the device.

# Using the RESET Button

To reboot the device using the **RESET** button, press the **RESET** button once.

# Restoring Factory Default Settings

This section provides information about restoring the device to factory default settings by using any of the following:

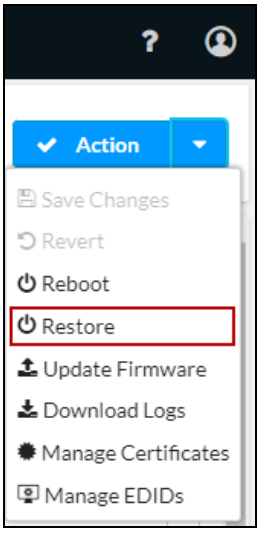
- Web interface
- Crestron Toolbox software
- SETUP button

## Using the Web Interface

To restore the factory default settings by using the web interface:

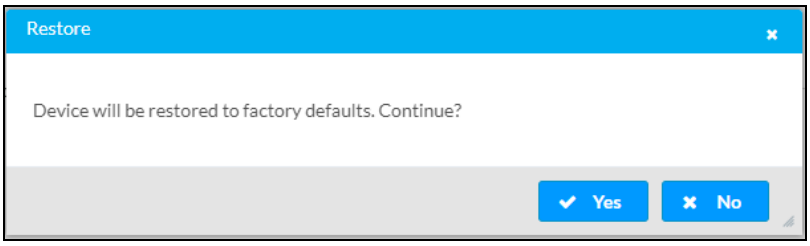
1. In the **Action** menu located in the upper-right corner of the web interface, click **Restore**.

   **Action Menu - Restore**

   The **Restore** pop-up dialog box opens, prompting for confirmation that the device be restored to factory default settings.

   **Action Menu - Restore, Restore Pop-Up Dialog Box**

2. Click the **Yes** button to restore factory default settings. The dialog box closes.

## Using Crestron Toolbox Software

To restore the factory default settings by using Crestron Toolbox software:

From the **Tools** menu, select **Text Console** and issue the `restore` command.

## Using the SETUP Button

> **NOTE:** The entire process of restoring factory default settings using the **SETUP** button takes about 5 minutes.

To restore factory default settings by using the **SETUP** button:

1. Remove power from the device.
2. Apply power to the device while simultaneously pressing the **SETUP** button for 10 seconds. After the 10 seconds, the SETUP LED flashes red three times. The PWR LED changes from amber to off and then to green and back to amber, off, and green a second time.

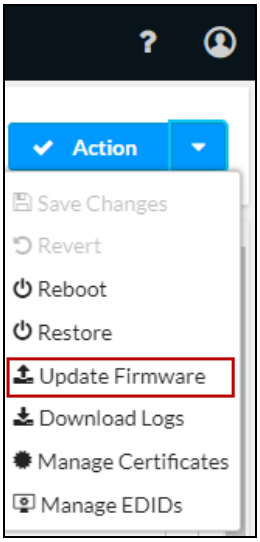
# Updating Firmware

This section provides information about updating firmware on a single DM NVX device by using the web interface.

> **NOTE:** The information below provides instructions for upgrading firmware manually. For instructions to update firmware automatically based on a scheduled period of time, refer to Auto Update.

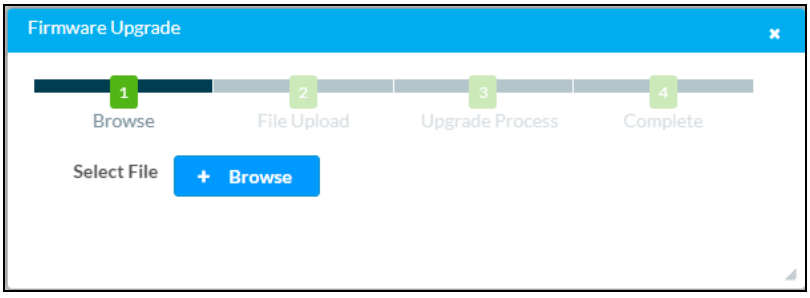
1. Download the latest firmware file (*.zip) from www.crestron.com/firmware to a computer.
2. In the **Action** menu located in the upper-right corner of the web interface, click **Update Firmware**.

   **Action Menu - Update Firmware**

   The **Firmware Upgrade - Browse** pop-up dialog box opens.

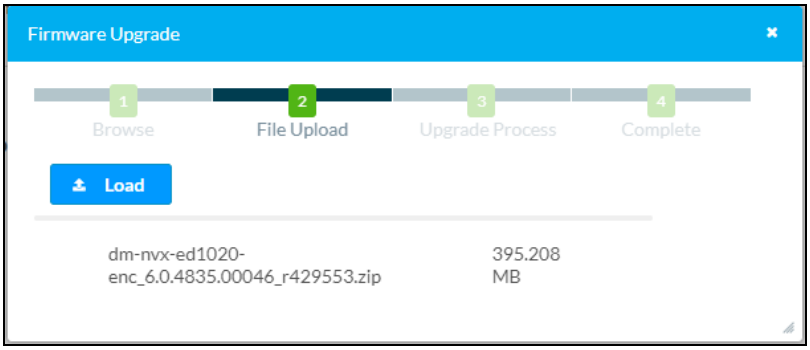
   **Firmware Upgrade - Browse Pop-Up Dialog Box**

3. Click **Browse**. File Explorer opens.
4. Navigate to the latest firmware file (*.zip), select the file, and then click **Open**.

   The **Firmware Upgrade - File Upload** dialog box opens.

**Firmware Upgrade - File Upload Dialog Box**




5. Click **Load**.

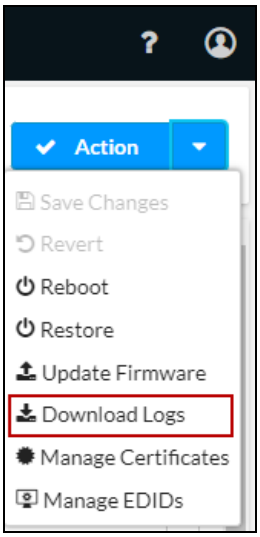
   The dialog box indicates the progress of the upload and upgrade process and the completion of the upgrade process.

# Downloading Device Logs

Device logs can be downloaded to a computer for diagnostic purposes. The information below provides instructions for downloading device logs by using the web interface.

In the **Action** menu located in the upper-right corner of the web interface, click **Download Logs**.

**Action Menu - Download Logs**



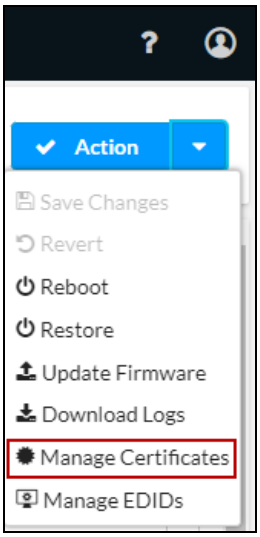

The **Loading** message appears indicating that the logs are being downloaded. When the process is complete, the device logs are downloaded in a compressed .tgz file. To view the device log files, extract them from the .tgz file.

# Managing Certificates

Root, intermediate, machine, and web server certificates can be managed by using the web interface.

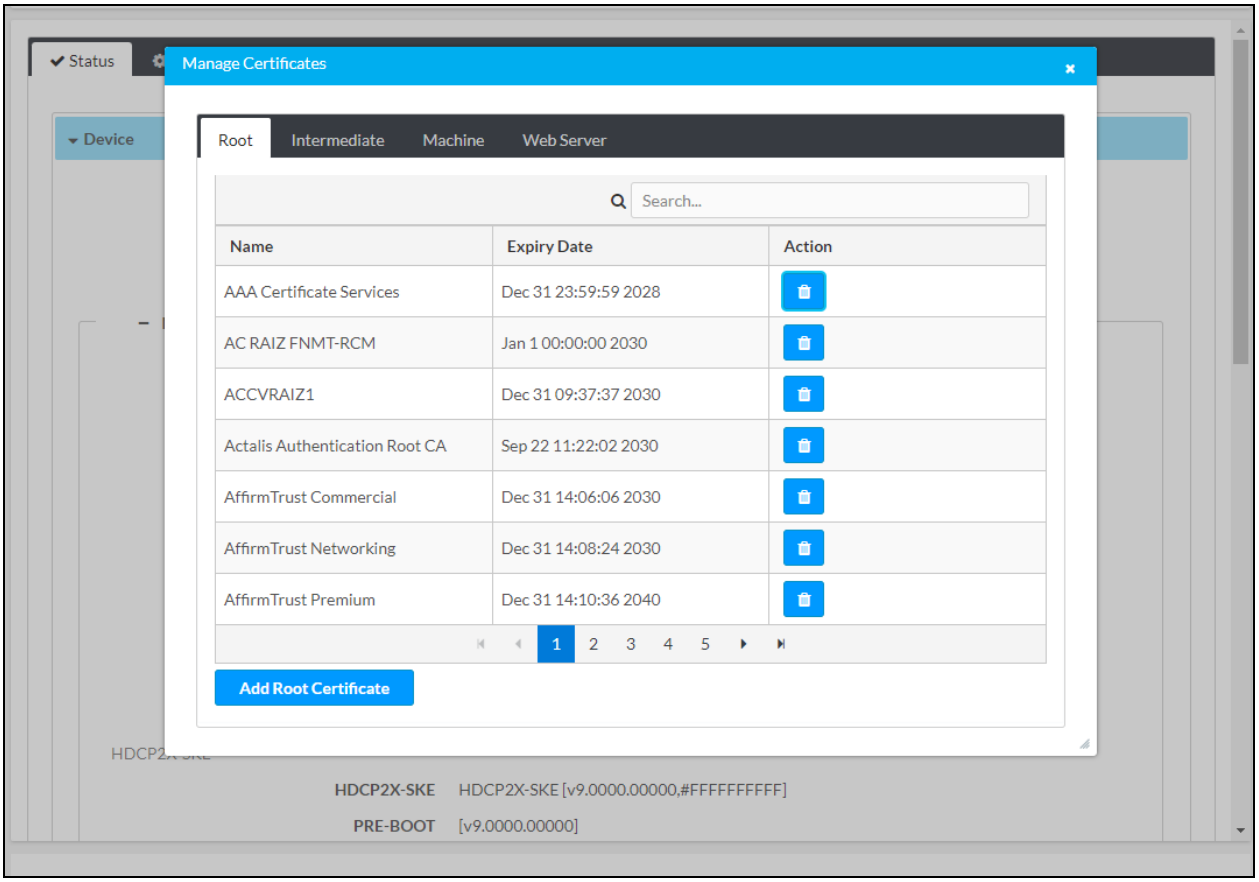
In the **Action** menu located in the upper-right corner of the web interface, click **Manage Certificates** to view information about certificates that reside on the DM NVX device or to add or delete certificates.

**Action Menu - Manage Certificates**




The **Manage Certificates** pop-up dialog box opens.

**Manage Certificates Pop-Up Dialog Box**




The **Manage Certificates** pop-up dialog box provides the following tabs based on certificate categories:

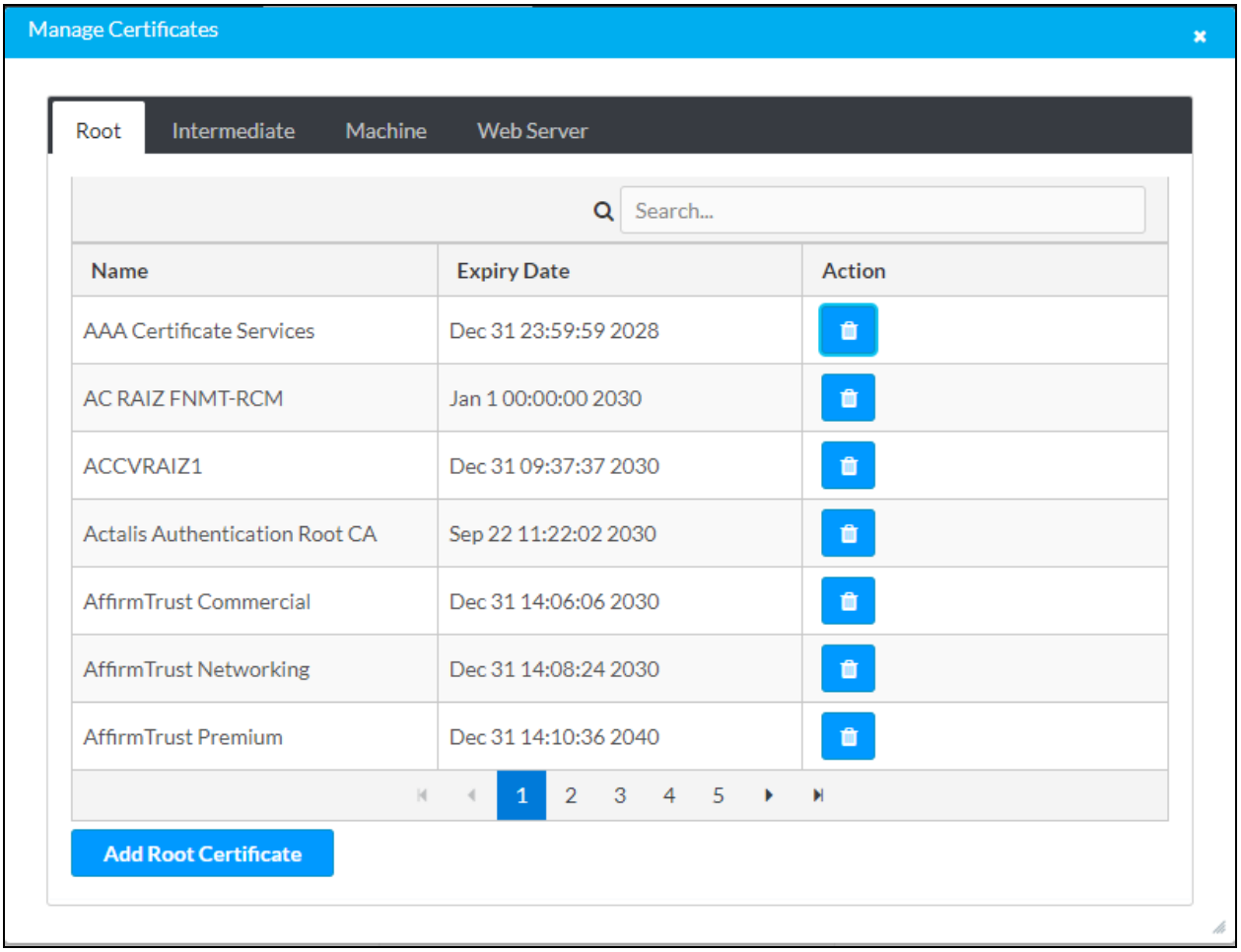
- **Root:** The Root tab lists all trusted root certificates preloaded into the DM NVX device. The root certificates are used by the DM NVX device to verify server certificates when acting as a TLS client. Root certificates are the beginning of a certificate chain. The Issuer and Subject fields of a root certificate are the same. A DM NVX device can use an alternate list of trusted certificates for certain protocols or use cases; however, unless specifically indicated, the Root store is used. To add or delete root certificates, refer to Managing Root Certificates.
- **Intermediate:** The Intermediate category of trusted certificates is identical to the Root category of trusted certificates except that the Intermediate store contains only intermediate certificates, which were signed by another certificate—the Issuer and Subject fields of the intermediate certificate are not the same. To add or delete intermediate certificates, refer to Managing Intermediate Certificates.
- **Machine:** The Machine category contains a single client certificate that is used only for IEEE 802.1X when **EAP-TLS Certificate** is selected as the authentication method in the **801.2x Configuration** tab of the web interface. The certificate must include a private key. To add or delete a machine certificate, refer to Managing Machine Certificates.

- **Web Server:** The Web Server category contains a single server certificate that is used by the web server. The web server certificate must include a private key. If no web server certificate is loaded, the default server certificate will be used. To add or delete a web server certificate, refer to Managing Web Server Certificates.

# Managing Root Certificates

Click the **Root** tab to view information about root certificates that reside on the DM NVX device or to add or delete root certificates. By default, the **Root** tab is displayed when the **Manage Certificates** pop-up dialog box opens.

**Manage Certificates Pop-Up Dialog Box - Root Tab**




The **Root** tab provides a table that displays the following information about root certificates:

- **Name:** Name of the certificate
- **Expiry Date:** Expiration date and time of the certificate

By default, up to seven certificates are displayed in the table simultaneously. If the number of certificates listed in the table exceeds seven, do either of the following to locate additional certificates:

- Use the Search box above the table.
- Use the scroll arrows at the bottom of the table to navigate through the list of certificates.

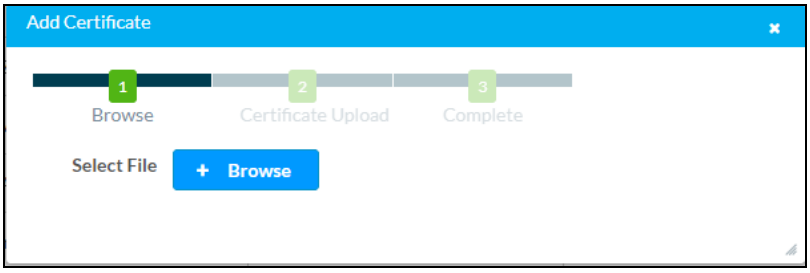
To manage root certificates, add or delete certificates as required.

## Add a Root Certificate

To add a root certificate:

1. In the **Root** tab, click the **Add Root Certificate** button.
2. The **Add Certificate - Browse** pop-up dialog box opens.

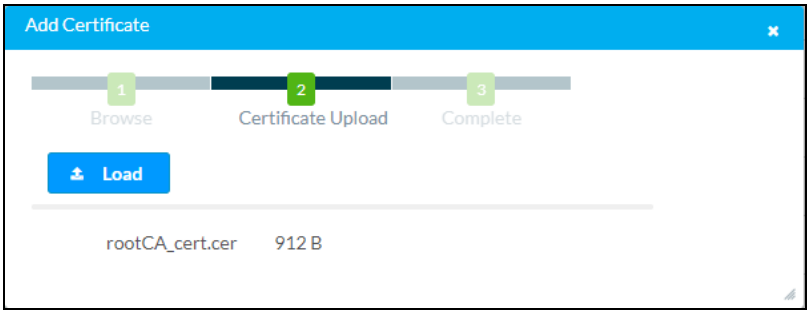
   **Add Certificate - Browse Pop-Up Dialog Box**

3. Click **Browse**. File Explorer opens.
4. Navigate to the desired certificate file, select the file, and then click **Open**.

   The **Add Certificate - Certificate Upload** dialog box opens.

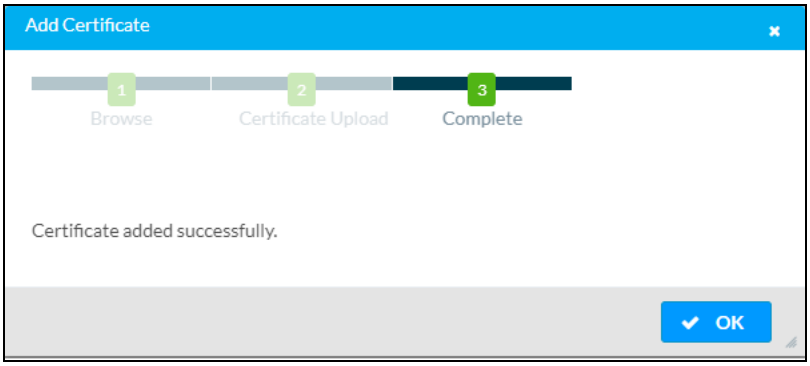
   **Add Certificate - Certificate Upload Dialog Box**

5. Click **Load**.

   When the certificate upload process is complete, the **Certificate added successfully** message appears in the **Add Certificate - Complete** dialog box.

**Add Certificate - Complete Dialog Box**




6. Click **OK** to close the dialog box.

   The certificate is added to the root certificate table.

7. Close the **Manage Certificates** pop-up dialog box by clicking the **x** in the upper-right corner.

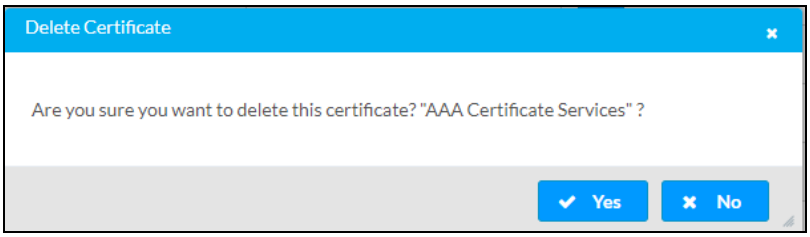
## Delete a Root Certificate

To delete a root certificate:

1. In the **Action** column of the root certificate table, click the Trash icon ( ) corresponding to the certificate.

   The **Delete Certificate** pop-up dialog box opens, prompting for confirmation that the certificate be deleted.

   **Delete Certificate Pop-Up Dialog Box**




2. Click **Yes** to delete the certificate.

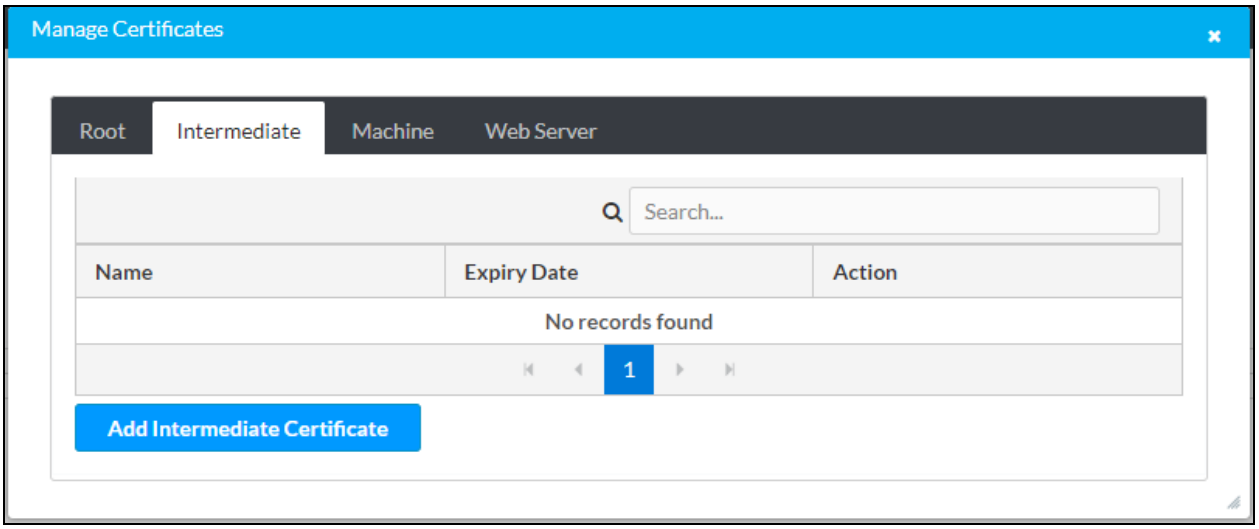
   The certificate is removed from the root certificate table.

3. Close the **Manage Certificates** pop-up dialog box by clicking the **x** in the upper-right corner.

# Managing Intermediate Certificates

In the **Manage Certificates** pop-up dialog box, click the **Intermediate** tab to view information about intermediate certificates that reside on the DM NVX device or to add or delete intermediate certificates.

**Manage Certificates Pop-Up Dialog Box - Intermediate Tab**




The **Intermediate** tab provides a table that displays the following information:

- **Name:** Name of the certificate
- **Expiry Date:** Expiration date and time of the certificate

By default, up to seven certificates can be displayed in the table simultaneously. If the number of certificates listed in the table exceeds seven, do either of the following to locate additional certificates:

- Use the Search box above the table.
- Use the scroll arrows at the bottom of the table to navigate through the list of certificates.

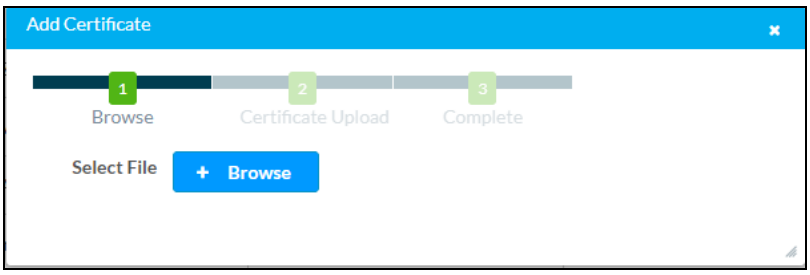
To manage intermediate certificates, add or delete certificates as required.

## Add an Intermediate Certificate

To add an intermediate certificate:

1. In the **Intermediate** tab, click the **Add Intermediate Certificate** button. The **Add Certificate - Browse** pop-up dialog box opens.

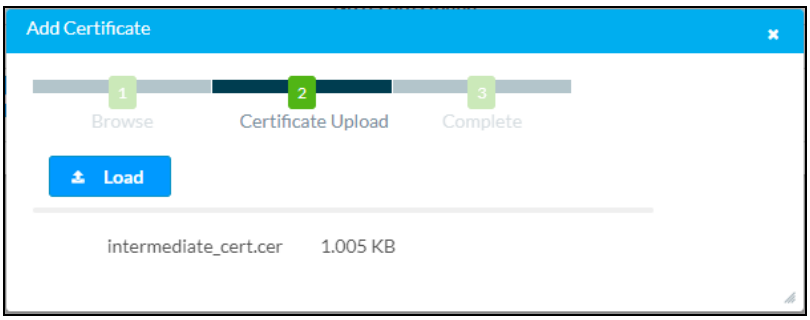
**Add Certificate - Browse Dialog Box**




2. Click **Browse**. File Explorer opens.
3. Navigate to the desired certificate file, select the file, and then click **Open**.

   The **Add Certificate - Certificate Upload** dialog box opens.

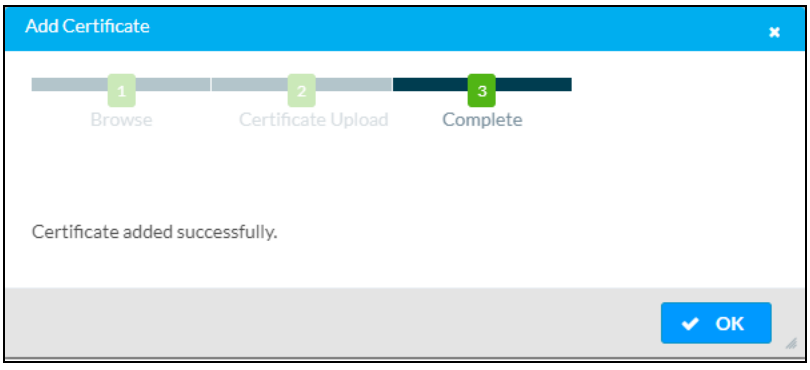
   **Add Certificate - Certificate Upload Dialog Box**




4. Click **Load**.

   When the certificate upload process is complete, the **Certificate added successfully** message appears in the **Add Certificate - Complete** dialog box.

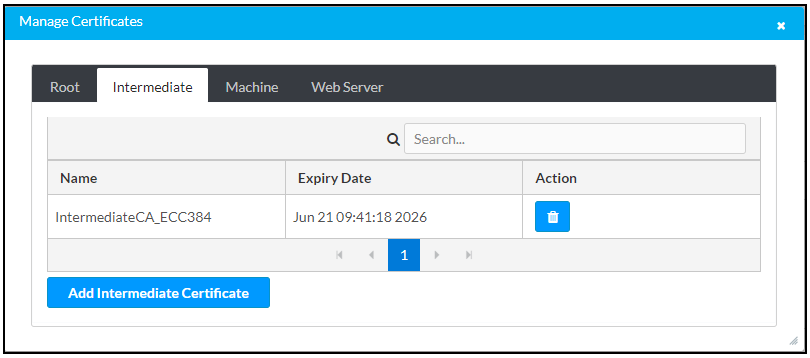
   **Add Certificate - Complete Dialog Box**




5. Click **OK** to close the dialog box.

   The newly added certificate is listed in the intermediate certificate table as shown in the example below.

**Addition of Intermediate Certificate**




6. Close the **Manage Certificates** pop-up dialog box by clicking the **x** in the upper-right corner.

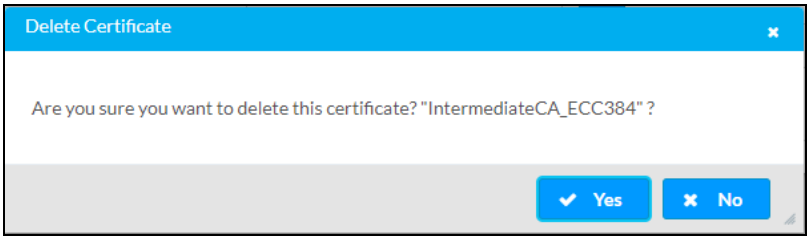
## Delete an Intermediate Certificate

To delete an intermediate certificate:

1. In the **Action** column of the intermediate certificate table, click the Trash icon ( ) corresponding to the certificate.

   The **Delete Certificate** pop-up dialog box opens, prompting for confirmation that the certificate be deleted.

   **Delete Certificate Pop-Up Dialog Box**




2. Click **Yes** to delete the certificate.

   The certificate is removed from the intermediate certificate table.

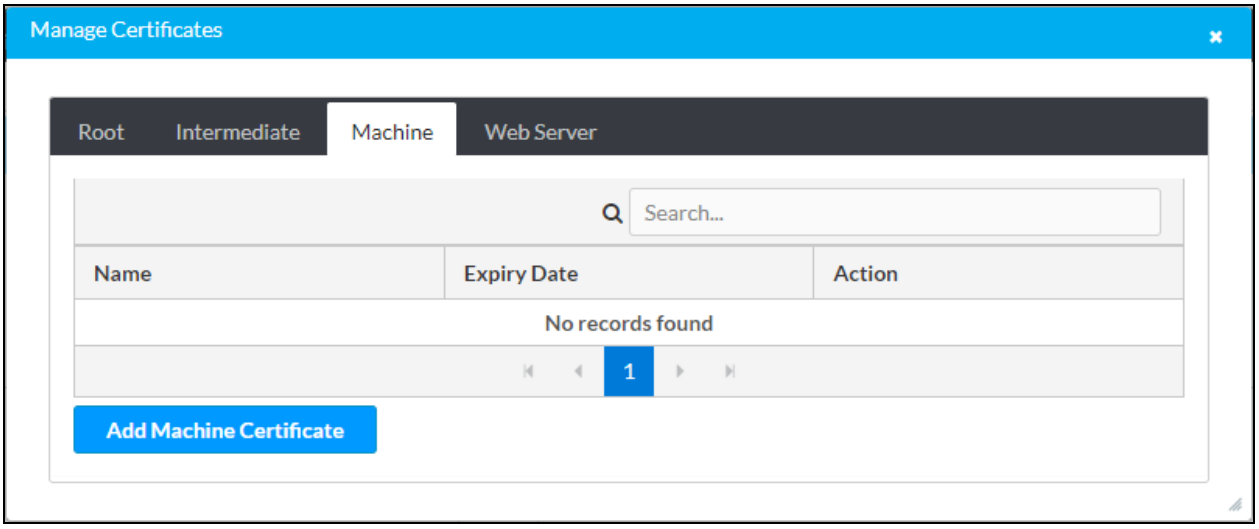
3. Close the **Manage Certificates** dialog box by clicking the **x** in the upper-right corner.

# Managing Machine Certificates

> **NOTE:** Only one machine certificate can reside on the DM NVX device.

In the **Manage Certificates** pop-up dialog box, click the **Machine** tab to view information about the machine certificate or to add or delete the certificate.

**Manage Certificates Dialog Box - Machine Tab**




The **Machine** tab provides a table that displays the following information:

- **Name:** Name of the certificate
- **Expiry Date:** Expiration date and time of the certificate

To manage the machine certificate, add or delete the certificate as required.

## Add the Machine Certificate

To add the machine certificate:

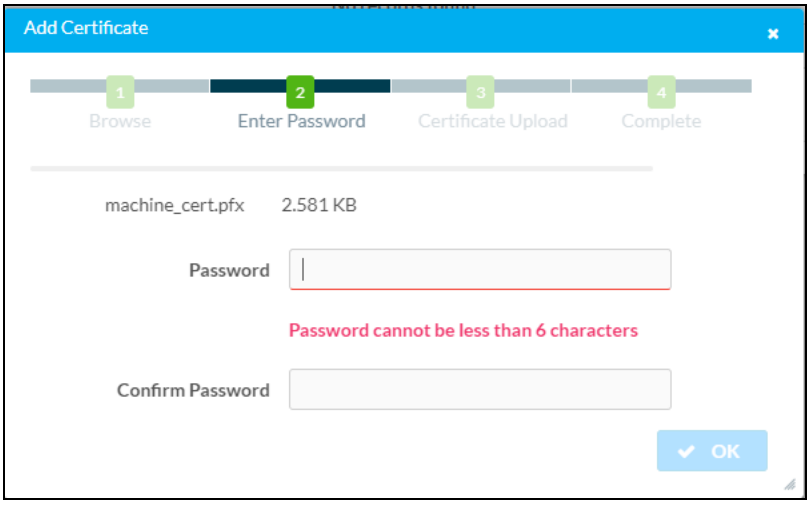
1. In the **Machine** tab, click the **Add Machine Certificate** button.
   The **Add Certificate - Browse** pop-up dialog box opens.
   **Add Certificate - Browse Pop-Up Dialog Box**


2. Click **Browse**. File Explorer opens.

3. Navigate to the desired certificate file, select the file, and then click **Open**.

   The **Add Certificate - Enter Password** dialog box opens.

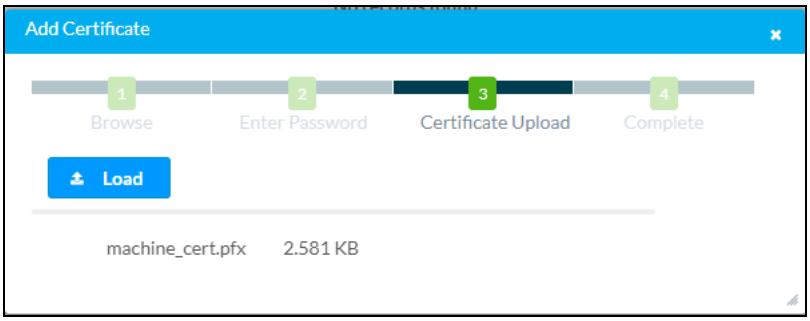
   **Add Certificate - Enter Password Dialog Box**



4. Do the following:
   a. In the **Password** text box, enter a password. The password cannot be less than 6 characters.
   b. In the **Confirm Password** text box, reenter the password for confirmation.
   c. Click **OK** to save the password.

   The **Add Certificate - Certificate Upload** dialog box opens.

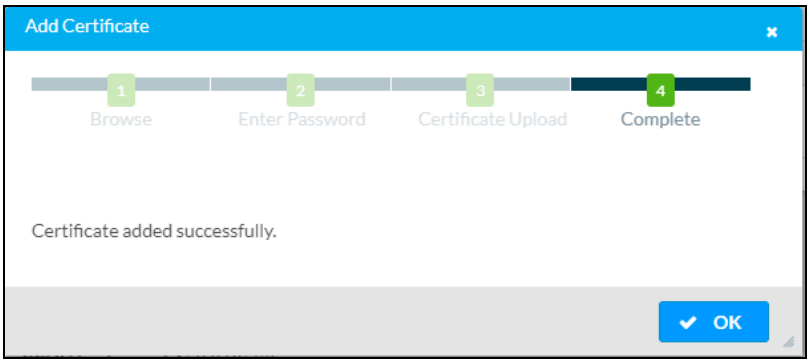
   **Add Certificate - Certificate Upload Dialog Box**




5. Click **Load**.

   When the certificate upload process is complete, the **Certificate added successfully** message appears in the **Add Certificate - Complete** dialog box.

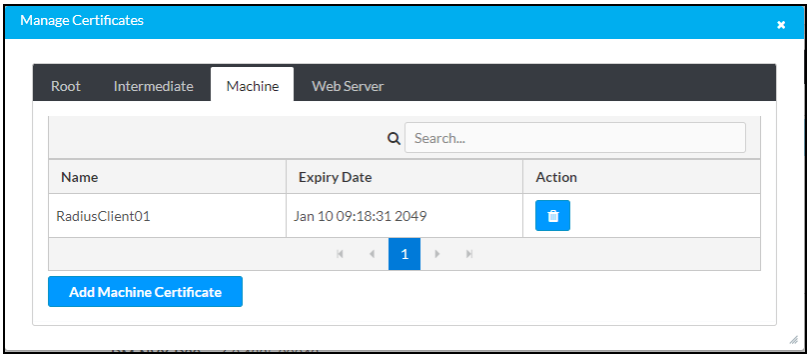
   **Add Certificate - Complete Dialog Box**




6. Click **OK** to close the dialog box.

   The newly added certificate is listed in the machine certificate table as shown in the example below.

**Addition of Machine Certificate**




7. Close the **Manage Certificates** pop-up dialog box by clicking the **x** in the upper-right corner.

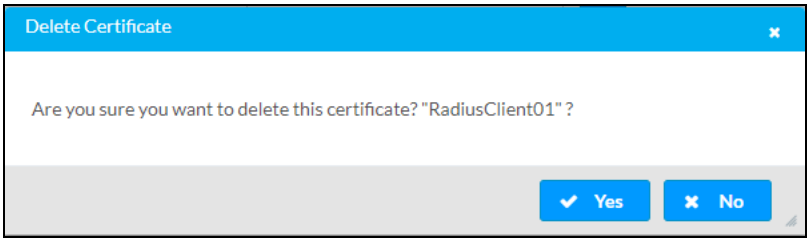
## Delete the Machine Certificate

To delete the machine certificate:

1. In the **Action** column of the machine certificate table, click the Trash icon ( ) corresponding to the certificate.

   The **Delete Certificate** pop-up dialog box opens, prompting for confirmation that the certificate be deleted.

   **Delete Certificate Pop-Up Dialog Box**




2. Click **Yes** to delete the certificate.

   The certificate is removed from the machine certificate table.

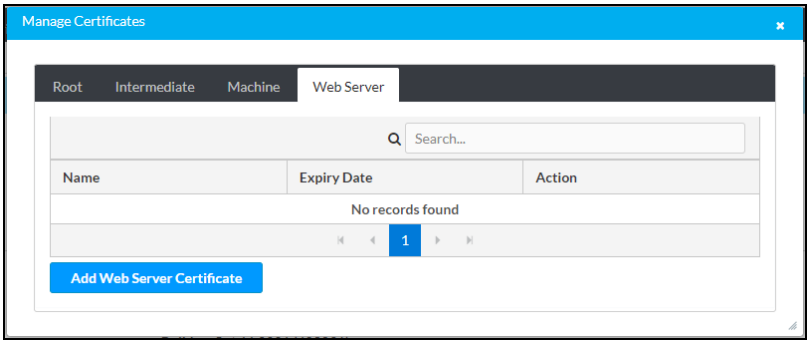
3. Close the **Manage Certificates** dialog box by clicking the **x** in the upper-right corner.

# Managing Web Server Certificates

> **NOTE:** Only one web server certificate can reside on the DM NVX device.

In the **Manage Certificates** pop-up dialog box, click the **Web Server** tab to view information about the web server certificate or to add or delete the certificate.

**Manage Certificates Pop-Up Dialog Box - Web Server Tab**




The **Web Server** tab provides a table that displays the following information:

- **Name:** Name of the certificate
- **Expiry Date:** Expiration date and time of the certificate

To manage the web server certificate, add or delete the certificate as required.

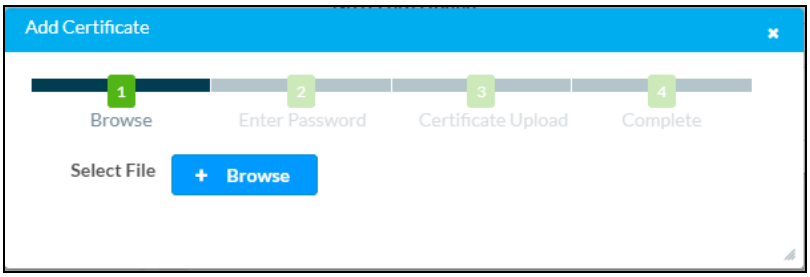
## Add the Web Server Certificate

To add the web server certificate:

1. In the **Web Server** tab, click the **Add Web Server Certificate** button.

   The **Add Certificate - Browse** pop-up dialog box opens.

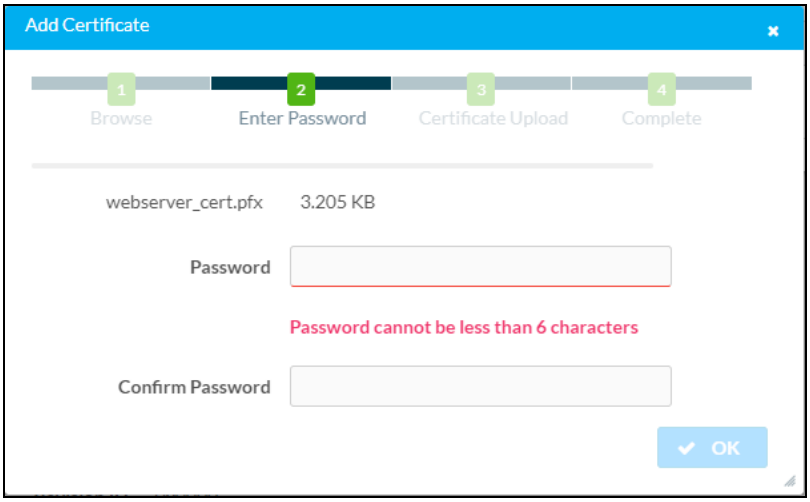
   **Add Certificate - Browse Pop-Up Dialog Box**




2. Click **Browse**. File Explorer opens.
3. Navigate to the desired certificate file, select the file, and then click **Open**.

   The **Add Certificate - Enter Password** dialog box opens.

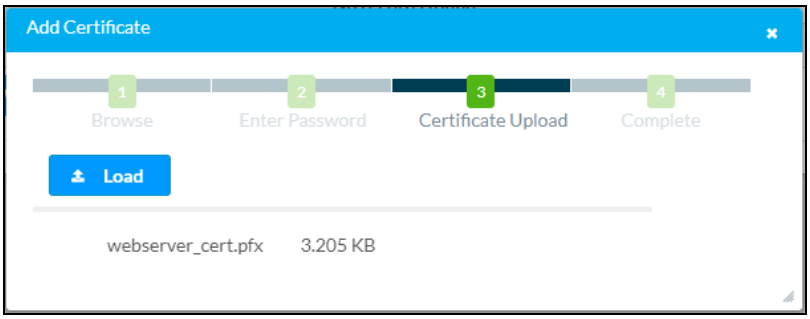
   **Add Certificate - Enter Password Dialog Box**



4. Do the following:
   a. In the **Password** text box, enter a password. The password cannot be less than 6 characters.
   b. In the **Confirm Password** text box, reenter the password for confirmation.
   c. Click **OK** to save the password.

   The **Add Certificate - Certificate Upload** dialog box opens.

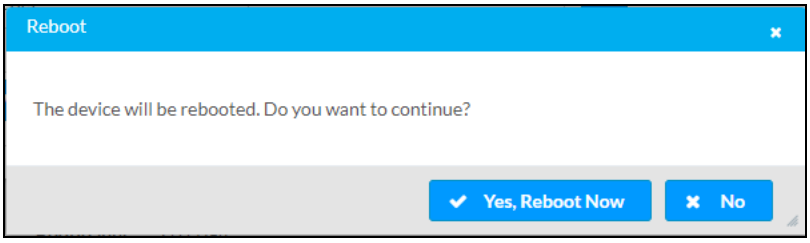
   **Add Certificate - Certificate Upload Dialog Box**




5. Click **Load**.

   The certificate is uploaded to the DM NVX device, and the **Reboot** dialog box opens, prompting for confirmation that the device be rebooted.

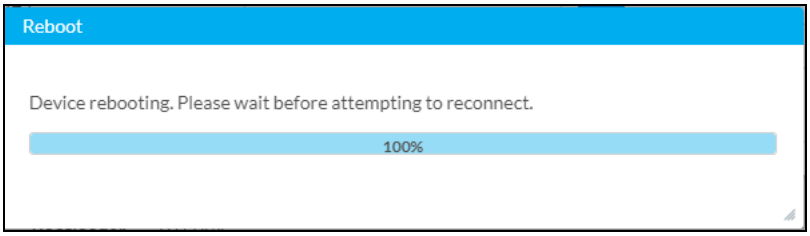
   **Reboot Dialog Box**




6. Click **Yes, Reboot Now** to reboot the device at the current time or click **No** to reboot the device at a later time.

   If **Yes, Reboot Now** is clicked, the **Reboot** message box appears, indicating that the device is rebooting. In addition, a progress indicator bar displays the percentage of completion of the reboot process. When the reboot process is complete, the progress indicator bar displays 100%.

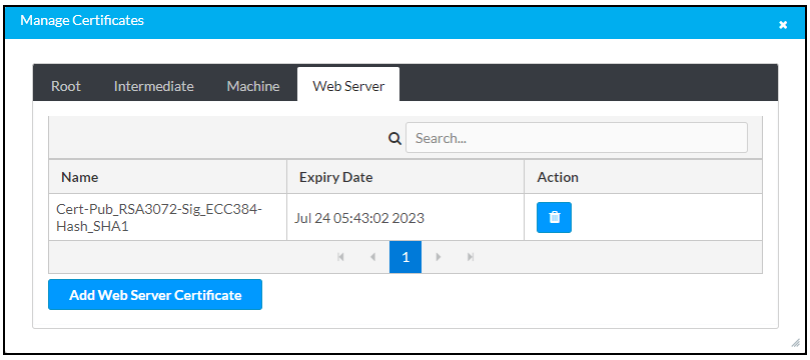
   **Reboot Message Box**




   The device returns to the Device Administration page.

The newly added web server certificate is listed in the web server certificate table as shown in the example below.

**Addition of Web Server Certificate**



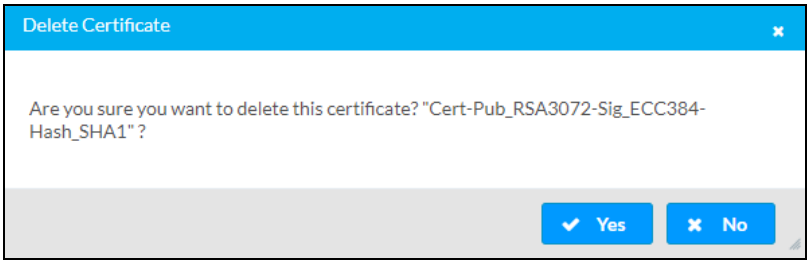

## Delete the Web Server Certificate

To delete the web server certificate:

1. In the **Action** column of the web server certificate table, click the Trash icon ( ) corresponding to the certificate.

   The **Delete Certificate** pop-up dialog box opens, prompting for confirmation that the certificate be deleted.

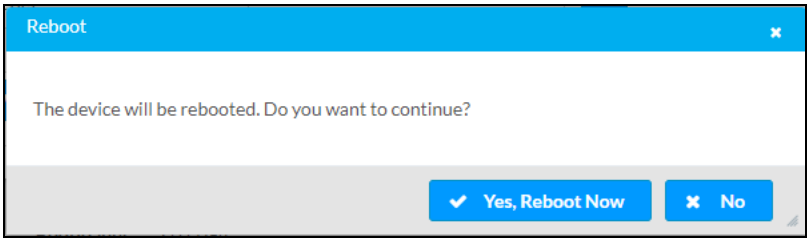
   **Delete Certificate Pop-Up Dialog Box**

2. Click **Yes** to delete the certificate.

   The **Reboot** dialog box opens, prompting for confirmation that the device be rebooted.

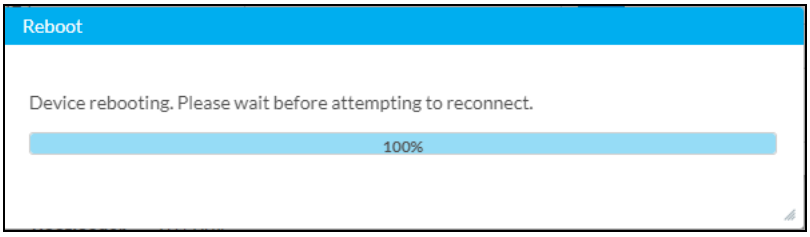
   **Reboot Dialog Box**

3. Click **Yes, Reboot Now** to reboot the device at the current time or click **No** to reboot the device at a later time.

If **Yes, Reboot Now** is clicked, the **Reboot** message box appears, indicating that the device is rebooting. In addition, a progress indicator bar displays the percentage of completion of the reboot process. When the reboot process is complete, the progress indicator bar displays 100%.

**Reboot Message Box**

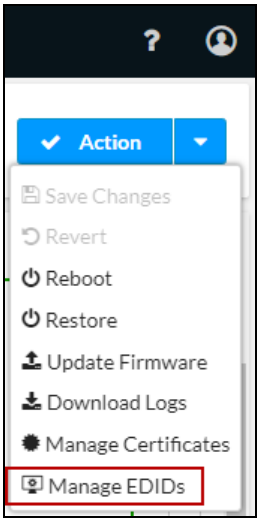



The device returns to the Device Administration page.

# Managing EDIDs (Encoder Only)

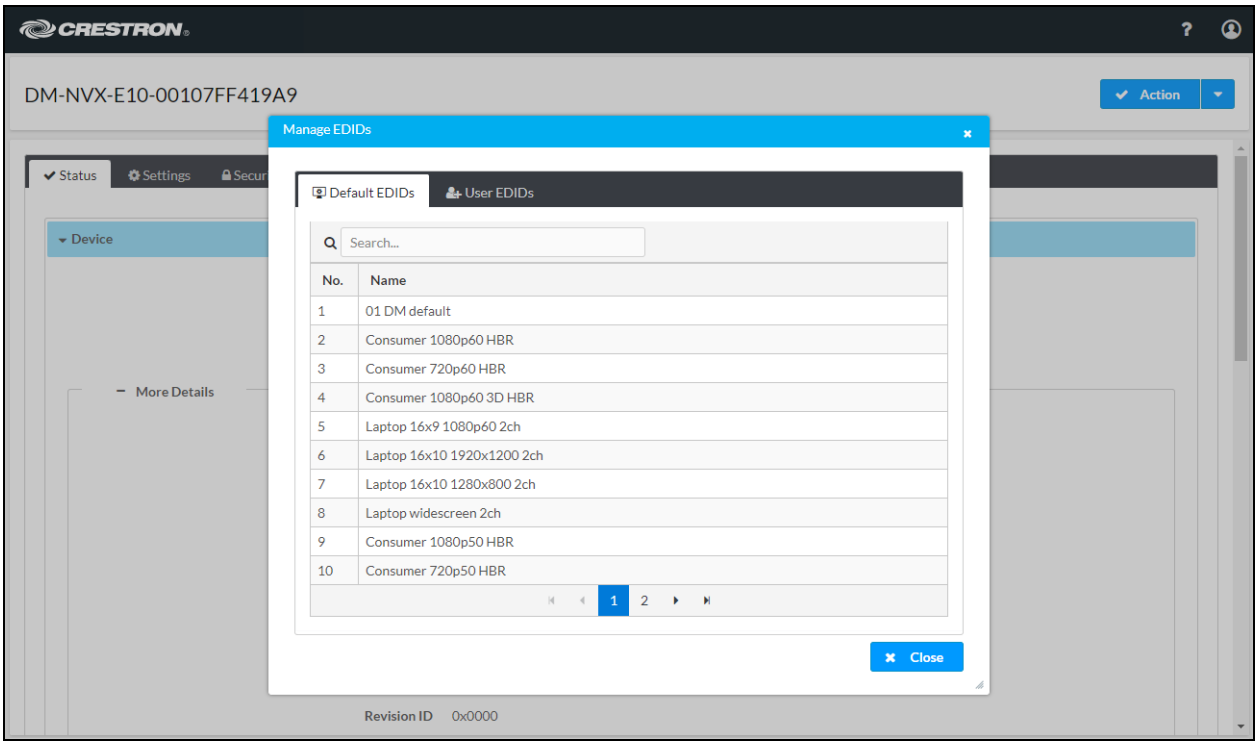
To view the list of default EDIDs or to add or delete user EDIDs, use the web interface as follows. In the **Action** menu located in the upper-right corner of the web interface, click **Manage EDIDs**.

**Action Menu - Manage EDIDs (Encoder Only)**




The **Manage EDIDs** pop-up dialog box opens.

**Manage EDIDs Pop-Up Dialog Box**



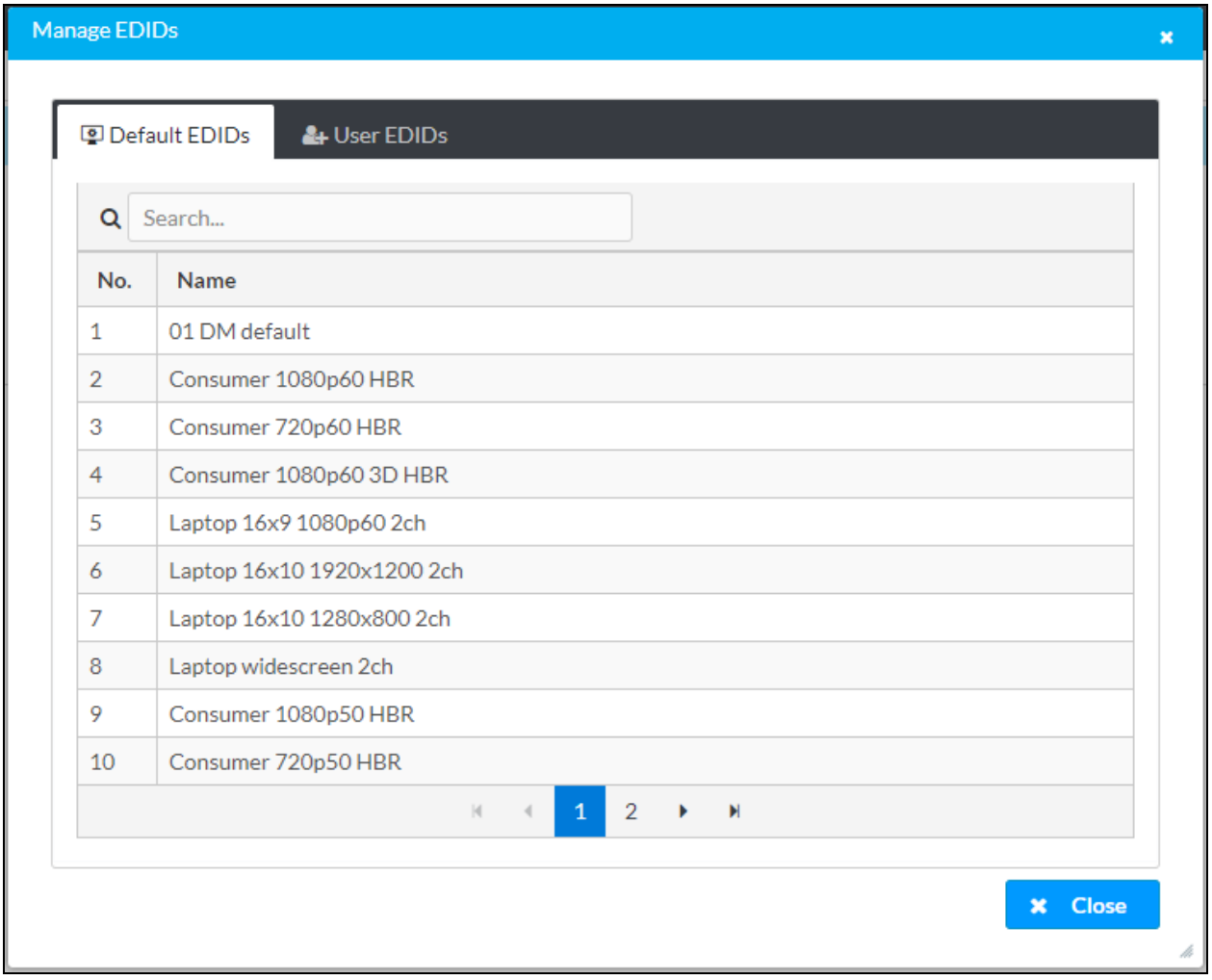

The **Manage EDIDs** pop-up dialog box provides the following tabs:

- **Default EDIDs** (refer to View Default EDIDs for information)
- **User EDIDs** (refer to Manage User EDIDs for information)

# Viewing Default EDIDs

Click the **Default EDIDs** tab to view all default EDIDs. By default, the **Default EDIDs** tab is displayed when the **Manage EDIDs** pop-up dialog box opens.

**Manage EDIDs Pop-Up Dialog Box, Default EDIDs Tab**



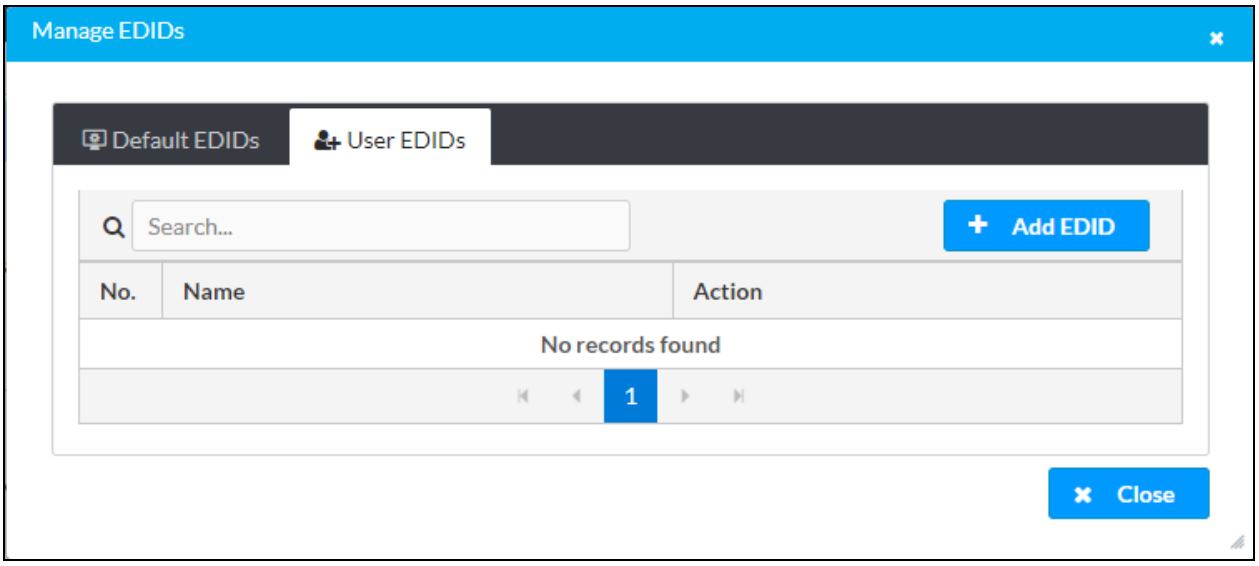

Up to 10 default EDIDs are displayed in the table simultaneously. To locate additional EDIDs in the table:

- Use the Search box above the table.
- Use the scroll arrows at the bottom of the table to navigate through the list of EDIDs.

# Managing User EDIDs

Click the **User EDIDs** tab to view, add, or delete user (custom) EDIDs.

**Manage EDIDs Pop-Up Dialog Box, User EDIDs Tab**




Up to 10 user EDIDs can be displayed in the table simultaneously. If the number of user EDIDs exceeds 10, do either of the following to locate one or more EDIDs in the table:

- Use the Search box above the table.
- Use the scroll arrows at the bottom of the table to navigate through the list of EDIDs.

To manage user EDIDs, add or delete EDIDs as required.

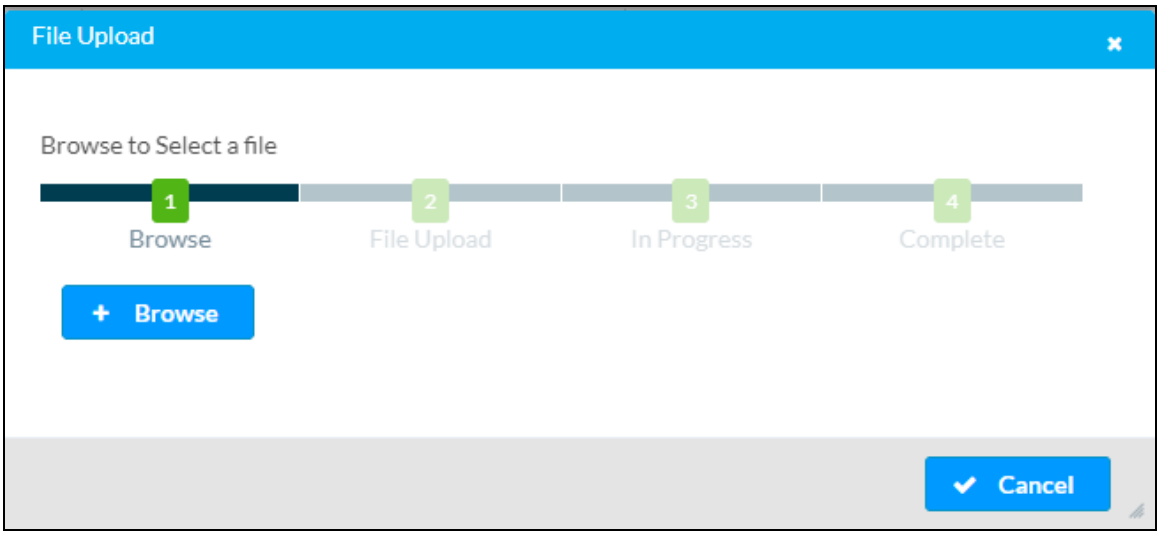
## Add a User EDID

To add a user EDID:

1. In the **User EDIDs** tab, click the **Add EDID** button.

   The **File Upload - Browse** dialog box opens.

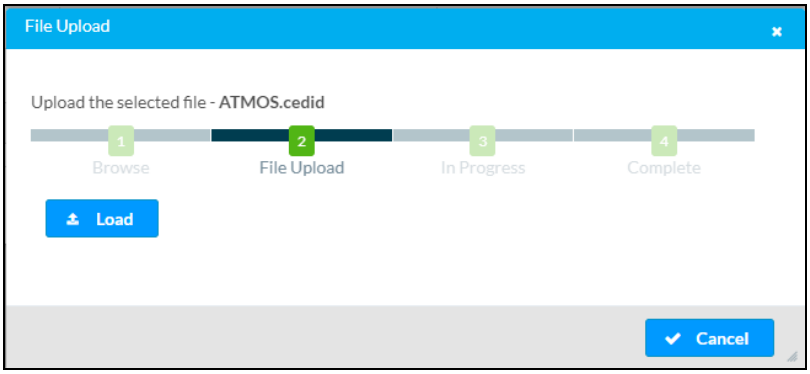
   **File Upload - Browse Dialog Box**




2. Click **Browse**. File Explorer opens.
3. Navigate to the desired EDID file (*.cedid), select the file, and then click **Open**.

   The **File Upload - Load** dialog box opens.

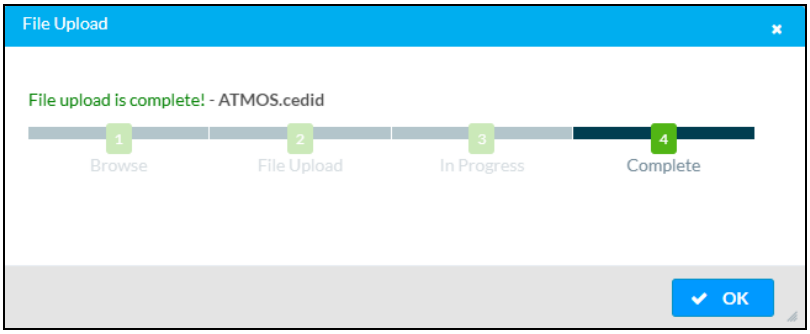
   **File Upload - Load Dialog Box**




4. Click **Load**.

   When the file upload process is complete, the **File upload is complete** message appears in the **File Upload - Complete** dialog box.

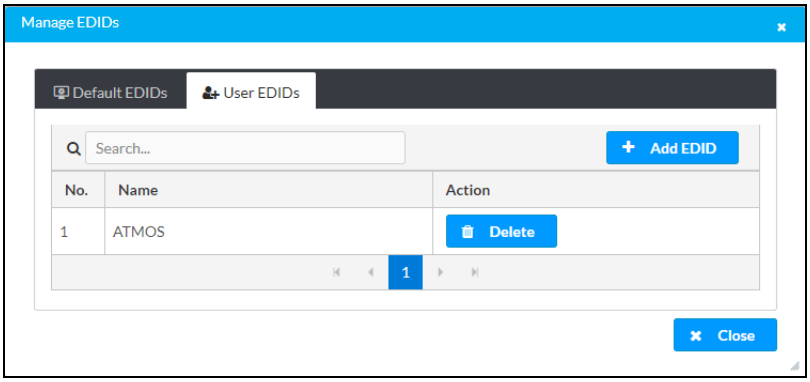
**File Upload - Complete Dialog Box**




5. Click **OK** to close the dialog box.

The newly added EDID file is listed in the **User EDIDs** table as shown in the example below.

**Addition of User EDID**



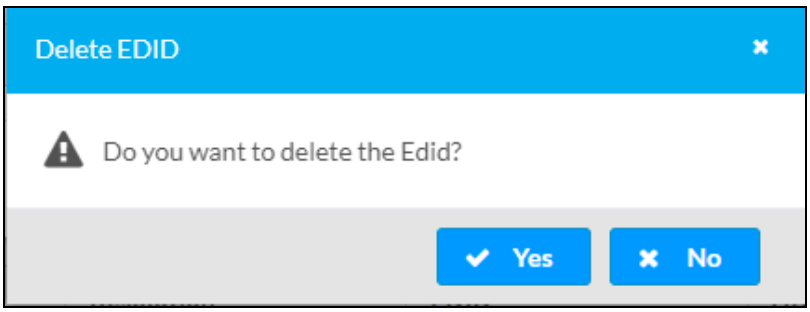
## Delete a User EDID

To delete a user EDID:

1. In the **Action** column of the User EDIDs table, click the **Delete** button corresponding to the EDID to be deleted.

   The **Delete EDID** dialog box opens, prompting for confirmation that the EDID be deleted.

   **Delete EDID Dialog Box**

2. Click **Yes** to delete the EDID.
3. In the **Manage EDIDs** pop-up dialog box, click **Close** to close the dialog box.

# Troubleshooting

The following table provides troubleshooting information. If additional assistance is required, contact Crestron True Blue Support.

**DM NVX Encoder/Decoder Troubleshooting**

| PROBLEM | POSSIBLE CAUSES | CORRECTIVE ACTIONS |
|---|---|---|
| 1080p video is intermittent. | The display device is not configured properly. | Configure the display device properly. Refer to the display device documentation for proper configuration to support 1080p video. |
| | A Crestron HDMI cable is not being used. | Use a Crestron HDMI cable only. |
| | The Crestron HDMI cable exceeds the maximum length of 20 ft (6.1 m). | Use a Crestron HDMI cable that does not exceed 20 ft (6.1 m). |
| | The HDMI or Ethernet cable connections are faulty. | Verity that all cables are connected securely. |
| The video is not being displayed, but the audio can be heard. | The HDCP settings of one or more DM NVX devices in the signal path do not support the HDCP level of the source. | Ensure that the HDCP settings of all DM NVX devices in the signal path support the HDCP level of the source. |
| | The display does not support the HDCP level of the source. | Ensure that the display supports the HDCP level of the source. |
| (Applicable to encoder only) A message indicating that the resolution is unsupported appears on the display. | The incorrect EDID is selected for the HDMI input. | Select the correct EDID. |
| | The resolution of the HDMI input is not supported. | Change the resolution of the input. |
| The video is not being displayed and audio cannot be heard. | Cable connections are faulty. | Verify that all cables are connected securely. |
| | The incorrect EDID is selected for the HDMI input. | Select the EDID supported by the devices in the signal path. |
| | The HDCP settings of one or more DM NVX devices in the signal path do not support the HDCP level of the source. | Ensure that the HDCP settings of all DM NVX devices in the signal path support the HDCP level of the source. |

| PROBLEM | POSSIBLE CAUSES | CORRECTIVE ACTIONS |
|---|---|---|
| Video from a 4K60 4:4:4 encoder (for example, a DM-NVX-36x or DM-NVX-E30) is not being displayed. | Incompatible stream type is set on the 4K60 4:4:4 encoder. | Ensure that the stream type is set to **DM-NVX-D10/D20/D200 Series** on the 4K60 4:4:4 encoder. |
| | The resolution of the video source connected to the 4K60 4:4:4 encoder is not supported by the DM-NVX-D10 decoder. | Change the resolution of the video source to 1080p or lower. |
| The analog audio output is not functioning. | The audio is multichannel on the encoder, which does not downmix a 2-channel signal from a multichannel surround sound source. | Switch the audio input to 2-channel audio. |
| The video flickers or drops when the DM NVX device is touched or when metal in the vicinity of the device is touched. | The DM NVX device is not grounded properly. | Properly ground the DM NVX device. |
| The DM NVX device indicates that the stream has started, but video is not being displayed. | Neither IGMPv2 nor IGMPv3 is enabled in the IGMP snooping configuration. | Ensure that IGMPv2 or IGMPv3 is enabled on the network switch. |
| Video is flickering or video is not displayed when multiple DM NVX devices connect to a network switch. | Neither IGMPv2 nor IGMPv3 snooping is enabled in the network switch for the associated port or VLAN. | Enable IGMPv2 or IGMPv3 snooping in the correct VLAN. |
| Video is flickering when multiple DM NVX encoders connect to a network switch. | The IGMP filter is not set to drop an unknown multicast IP address. | Configure the network switch to drop the unknown multicast IP address. |
| A DM NVX multicast stream stopped. | The multicast address is not set properly on the DM NVX device. | Ensure that the multicast address is not a duplicate of a multicast address that is set on another DM NVX device. Use a valid multicast address on the DM NVX device. |
| DM NVX streaming video is not seen in the decoder. | The DM NVX decoder is not configured with the correct streaming URL and multicast IP address. | Configure the DM NVX decoder using the correct streaming URL and multicast IP address. |
| Video stops suddenly, and the IGMP reports disappear in the network switch. | The IGMP querier is not configured correctly. | Configure the IGMP querier correctly. The recommended setting is the default setting of the network switch. |

# Resources

For additional information, refer to the following resources.

## Related Documentation

- DM NVX AV-over-IP System Design Guide
- DM-NVX-DIR Series Product Manual
- DM NVX Security Reference Guide
- SW-DMNVXTOOL Product Page
- .AV Framework™ Software User Guide
- XiO Cloud® User Guide
- Crestron Home™ OS User Guide

## Programmer and Developer Resources

- help.crestron.com
- developer.crestron.com

## Crestron Support and Training

- Crestron True Blue Support
- Crestron Resource Library
- Crestron Online Help (OLH)
- Crestron Training Institute (CTI) Portal

## Product Certificates

To search for product certificates, refer to support.crestron.com/app/certificates.

# Appendix. IGMP Snooping

A DM NVX device sends IGMP join and leave messages. The network switch port that connects to a DM NVX device must be enabled with IGMPv2 or IGMPv3 snooping to prevent the switch from flooding the multicast destination address traffic to all other connected ports. The multicast destination address that is configured for the DM NVX device must be within the range of qualified addresses. An upstream device such as a layer 3 router or switch periodically sends the IGMP General Query messages to hosts in order to maintain group membership state information. These queries can be either general or group-specific queries. The host responds to queries with IGMP membership reports. The host running IGMPv2 or IGMPv3 may also send a Leave Group message to routers or switches in order to withdraw from the group.

**NOTES:**

- DM NVX devices do not support random-timer and source-specific queries.
- As a host, a DM NVX device configured for support of IGMPv3 is compatible with a network switch (IGMP querier) that is configured for IGMPv2.

IGMP snooping switches build forwarding lists by listening for and, in some cases, intercepting IGMP messages. Although the software processing the IGMP messages may maintain state information based on the full IP group addresses, the forwarding tables are typically mapped to link layer addresses as shown in the following example.

**Example of Forwarding Table**

| Multicast MAC Address | Member Ports |
|---|---|
| 01-00-5E-00-00-01 | 2, 7 |
| 01-00-5E-01-02-03 | 1, 2, 3, 7 |
| 01-00-5E-23-E2-05 | 1, 4 |

Because only the least significant 23 bits of the IP address are mapped to Ethernet addresses (RFC 1112), there is a loss of information when forwarding solely on the destination MAC address. For example, IP addresses 224.0.0.123 and 239.128.0.123 and similar IP multicast addresses all map to MAC address 01-00-5e-00-00-7b for Ethernet. As a result, IGMP snooping switches may collapse IP multicast group memberships into a single Ethernet multicast membership group.

In addition to building and maintaining lists of multicast group memberships, the snooping switch must also maintain a list of multicast routers. When multicast packets are forwarded, the packets should be forwarded not only on ports that have expressed joins using IGMP but also on ports to which multicast routers are attached.

NOTES:

- Do not assign reserved multicast IP addresses to a DM NVX device for streaming. For additional information, go to https://www.iana.org/assignments/multicast-addresses/multicast-addresses.txt.
- Multicast collision is a concern with IPv4. For example, multicast IPv4 addresses 224.8.7.6 and 229.136.7.6 translate to the same MAC address (01:00:5E:08:07:06).

The following items provide recommendations for configuration of a network switch for IGMP snooping:

- Set the IGMP query interval to 60 seconds or 125 seconds. The recommended setting is the default setting of the network switch.
- For good network performance, ensure that there is only one IGMP querier in the network.
- Set IGMP snooping to v2 or v3.
- Enable IGMP snooping globally as well as for each specific VLAN for DM NVX connected ports.
- Configure the network switch to drop unknown multicast packets.
- If the network switch supports IGMP fast leave, enable the configuration at the port, global, or VLAN level.
- If the network switch supports PIM snooping, enable the configuration to prevent flooding IP multicast traffic toward multicast router (mrouter) ports.

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change without notice.