



DM NVX[®] Network AV Encoders/Decoders

DM-NVX-E30

DM-NVX-D30

DM-NVX-E30C

DM-NVX-D30C

DM-NVX-D80-IOAV

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.

Crestron product development software is licensed to Crestron dealers and Crestron Service Providers (CSPs) under a limited nonexclusive, nontransferable Software Development Tools License Agreement. Crestron product operating system software is licensed to Crestron dealers, CSPs, and end-users under a separate End-User License Agreement. Both of these Agreements can be found on the Crestron website at www.crestron.com/legal/software_license_agreement.

The product warranty can be found at www.crestron.com/warranty.

The specific patents that cover Crestron products are listed at www.crestron.com/legal/patents.

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

Crestron, the Crestron logo, 3-Series, Crestron Toolbox, DigitalMedia, DM NVX, DM NVX Director, and XiO Cloud are either trademarks or registered trademarks of Crestron Electronics, Inc. in the United States and/or other countries. Dolby and Dolby Atmos are either trademarks or registered trademarks of Dolby Laboratories in the United States and/or other countries. DTS HD and DTS:X are either trademarks or registered trademarks of DTS, Inc. in the United States and/or other countries. HDMI and the HDMI logo are either trademarks or registered trademarks of HDMI Licensing LLC in the United States and/or other countries. Intel is either a trademark or registered trademark of Intel Corporation in the United States and/or other countries. Active Directory is either a trademark or registered trademark of Microsoft Corporation in the United States and/or other countries. DisplayPort is either a trademark or registered trademark of Video Electronics Standards Association in the United States and/or other countries. Other trademarks, registered trademarks, and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Crestron disclaims any proprietary interest in the marks and names of others. Crestron is not responsible for errors in typography or photography.

HDMI

©2022 Crestron Electronics, Inc.

Contents

| | |
|---|----------|
| Overview | 1 |
| Physical Description | 2 |
| DM-NVX-E30 and DM-NVX-D30 | 2 |
| Front Panel, DM-NVX-E30 | 2 |
| Front Panel, DM-NVX-D30 | 3 |
| Rear Panel, DM-NVX-E30 and DM-NVX-D30 | 4 |
| DM-NVX-E30C | 5 |
| DM-NVX-D30C | 6 |
| DM-NVX-D80-IOAV | 7 |
| Front Panel | 7 |
| Rear Panel | 8 |
| Status and Configuration | 9 |
| DMF-CI-8 Chassis Details | 10 |
| Using the Web Interface | 10 |
| Using SIMPL Windows | 10 |
| DM NVX Director Virtual Switching Appliance | 11 |
| Crestron XiO Cloud Service Connection | 12 |
| Fan Control | 13 |
| Using the Web Interface | 13 |
| Using SIMPL Windows | 14 |
| Automatic Point-to-Point Connectivity | 14 |
| Using the Web Interface | 15 |
| Using SIMPL Windows | 15 |
| Stream Statistics | 16 |
| Using the Web Interface | 16 |
| Using SIMPL Windows | 17 |
| Image Preview | 18 |
| Using the Web Interface | 18 |
| Using SIMPL Windows | 19 |
| Multicast TTL (Time-to-Live) | 20 |
| Using the Web Interface | 20 |
| Using SIMPL Windows | 21 |
| DSCP (Differentiated Services Code Point) | 22 |
| Fixed, Adaptive, or Variable Bit Rate | 24 |
| Using the Web Interface | 25 |
| Using SIMPL Windows | 25 |
| 7.1 Surround Sound Audio | 26 |
| DM NAX Audio over IP (AES67) | 26 |
| Using the Web Interface | 26 |

| | |
|---|-----------|
| | 31 |
| Using SIMPL Windows | 31 |
| Analog Audio Output | 32 |
| Using the Web Interface | 32 |
| Using SIMPL Windows | 32 |
| Subscriptions | 33 |
| Using the Web Interface | 33 |
| Using SIMPL Windows | 35 |
| EDID (Extended Display Identification Data) | 35 |
| Background Image | 38 |
| Using the Web Interface | 38 |
| Using SIMPL Windows | 43 |
| Still Image Detection | 43 |
| USB 2.0 Routing | 44 |
| Using the Web Interface | 45 |
| Using SIMPL Windows | 47 |
| Test Pattern Generator | 49 |
| Using the Web Interface | 49 |
| Using SIMPL Windows | 52 |
| Enterprise-Grade Security | 52 |
| Authentication Management | 52 |
| IEEE 802.1X Authentication | 53 |
| Automatic Firmware Update | 55 |
| IGMP Snooping | 57 |
| Troubleshooting | 60 |
| Appendix: Device Discovery | 63 |

Overview

Crestron® DM NVX® network AV encoders/decoders transport ultra high-definition 4K video with 60 Hz frame rates and 4:4:4 color sampling over standard Gigabit Ethernet. Support for High Dynamic Range (HDR) video and HDCP 2.2 ensures high picture quality and compatibility with a variety of media sources. Using Pixel Perfect Processing technology, a video signal is encoded and decoded to achieve imperceptible end-to-end latency of less than 1 frame.

DM-NVX-E30(C) devices consist of the DM-NVX-E30 surface-mountable endpoint and the DM-NVX-E30C card, which function as encoders (transmitters) only. DM NVX D30(C) devices consist of the DM-NVX-D30 surface-mountable endpoint and the DM-NVX-D30C card, which function as decoders (receivers) only. The DM-NVX-D80-IOAV also functions as a decoder only and is compatible with the Intel® OPS (Open Pluggable Specification).

Compact in design, the DM-NVX-E30 and DM-NVX-D30 are designed to mount to a flat surface such as a wall. The DM-NVX-E30C and DM NVX D30C are designed to occupy a slot in the DMF-CI-8 card chassis. The DM-NVX-D80-IOAV is designed for installation into the OPS slot of an OPS-supported display.

NOTE: The DM-NVX-D30, DM-NVX-D30C, and DM-NVX-D80-IOAV do not support video scaling.

This manual provides information about the following:

- [Physical description](#)
- [Status and configuration](#)
- [IGMP snooping](#)
- [Troubleshooting](#)

In addition, information about device discovery of a DM NVX device using Crestron Toolbox™ software is provided in the appendix of this manual. For installation information, refer to the [DM-NVX-E30/DM-NVX-D30 Quick Start](#) (Doc. 8211), [DM-NVX-E30C/DM-NVX-D30C Quick Start](#) (Doc. 8346), or [DM-NVX-D80-IOAV Quick Start](#) (Doc. 8526) as appropriate. For information about designing a DM NVX system, refer to the [DM NVX AV-over-IP System Design Guide](#) (Doc. 7977).

Physical Description

The following sections provide information about the connectors, controls, and indicators that are available on the DM-NVX-E30(C), DM-NVX-D30(C), and DM-NVX-D80-IOAV devices.

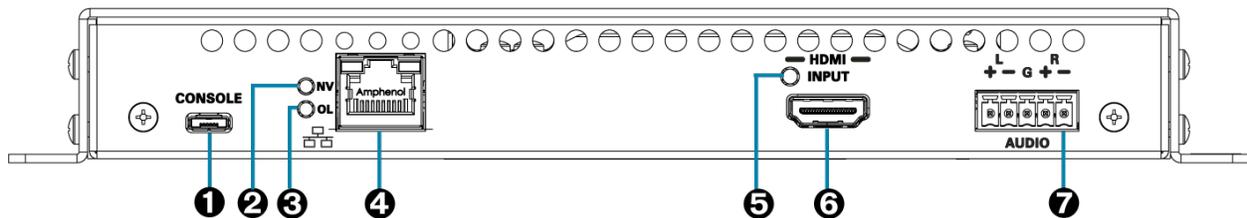
DM-NVX-E30 and DM-NVX-D30

This section provides information about the front and rear panels of the DM-NVX-E30 and DM-NVX-D30.

Front Panel, DM-NVX-E30

The following illustration shows the front panel of the DM-NVX-E30.

DM-NVX-E30 Front Panel



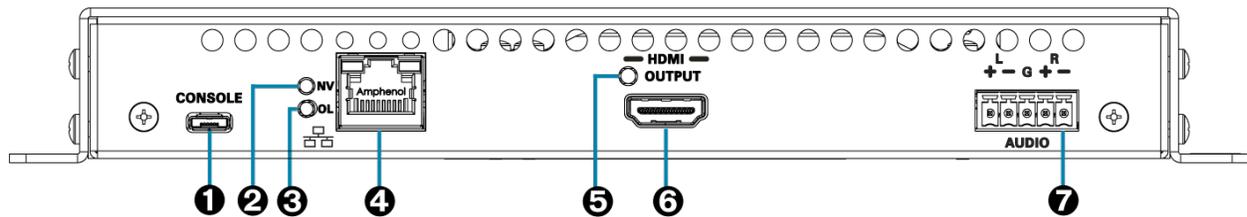
- 1 CONSOLE:** Micro USB connector, female; USB 2.0 computer console port for setup
- 2 NV LED:** Green LED, indicates that the device is transmitting and encoding network video
- 3 OL LED:** Green LED, indicates an online connection to a control system via Ethernet
- 4 Ethernet:** 8-pin RJ-45 connector, female; 100BASE-TX/1000BASE-T Ethernet port; PoE+ PD (powered device) port compatible with a PoE+ compliant Ethernet switch, a Crestron DM-PSU-ULTRA-MIDSPAN, or an approved third-party PSE; Green LED indicates Ethernet link status; Amber LED indicates Ethernet activity
- 5 HDMI INPUT LED:** Green LED, indicates sync detection at the HDMI® input
- 6 HDMI INPUT:** HDMI Type A connector, female; HDMI digital video/audio input (DVI and Dual-Mode DisplayPort™ interface compatible)

- 7 **AUDIO:** 5-pin 3.5 mm detachable terminal block;
Balanced/unbalanced stereo line-level audio output, functional only when the device is receiving a 2-channel stereo input signal;
Output Impedance: 200 Ohms balanced, 100 Ohms unbalanced;
Maximum Output Level: 4 Vrms balanced, 2 Vrms unbalanced

Front Panel, DM-NVX-D30

The following illustration shows the front panel of the DM-NVX-D30.

DM-NVX-D30 Front Panel

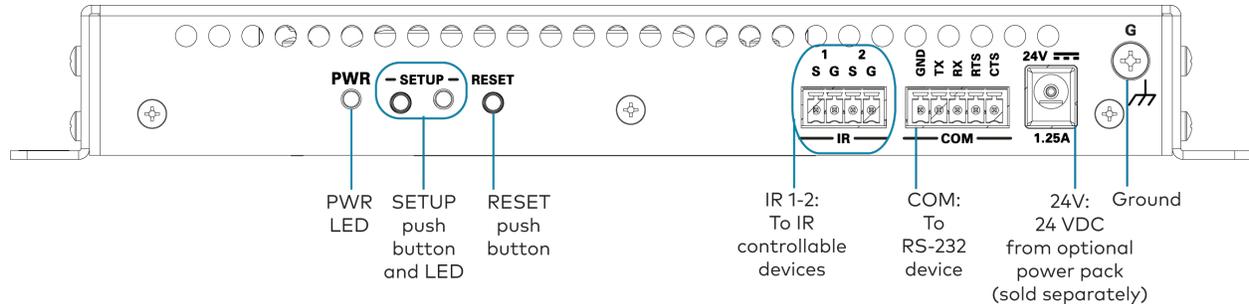


- 1 **CONSOLE:** Micro USB connector, female;
USB 2.0 computer console port for setup
- 2 **NV LED:** Green LED, indicates that the device is receiving and decoding network video
- 3 **OL LED:** Green LED, indicates an online connection to a control system via Ethernet
- 4 **Ethernet:** 8-pin RJ-45 connector, female;
100BASE-TX/1000BASE-T Ethernet port;
PoE+ PD (powered device) port compatible with a PoE+ compliant Ethernet switch, a Crestron DM-PSU-ULTRA-MIDSPAN, or an approved third-party PSE;
Green LED indicates Ethernet link status;
Amber LED indicates Ethernet activity
- 5 **HDMI OUTPUT LED:** Green LED, indicates video signal transmission at the HDMI output
- 6 **HDMI OUTPUT:** HDMI Type A connector, female;
HDMI digital video/audio input (DVI compatible)
- 7 **AUDIO:** 5-pin 3.5 mm detachable terminal block;
Balanced/unbalanced stereo line-level audio output, functional only when the device is receiving a 2-channel stereo input signal;
Output Impedance: 200 Ohms balanced, 100 Ohms unbalanced;
Maximum Output Level: 4 Vrms balanced, 2 Vrms unbalanced

Rear Panel, DM-NVX-E30 and DM-NVX-D30

The following illustration shows the rear panel of the DM-NVX-E30 and DM-NVX-D30.

DM-NVX-E30 and DM-NVX-D30 Rear Panel

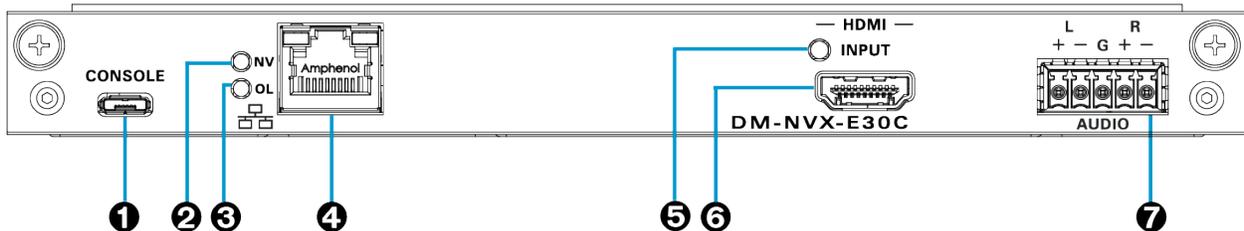


- 1 PWR:** Bicolor green/amber LED, indicates operating power supplied via the power pack (sold separately), PoE+ compliant Ethernet switch, or injector/PSE;
Lights amber while booting and green when operating
- 2 SETUP:** Push button for on-screen display of IP address;
Red LED, indicates that the **SETUP** button is pressed and times out automatically
- 3 RESET:** Recessed push button for hardware reset
- 4 IR 1-2:** 4-pin 3.5 mm detachable terminal block;
Comprised of two IR/serial ports;
IR output up to 1.1 MHz;
1-way serial TTL/RS-232 (0–5 volts) up to 19200 baud;
Crestron IRP2 emitter sold separately
- 5 COM:** 5-pin 3.5 mm detachable terminal block;
Bidirectional RS-232 port;
Up to 115.2k baud, hardware and software handshaking support
- 6 24VDC 1.25A:** 2.1 x 5.5 mm DC power connector;
24 VDC power input;
PW-2412WU power pack (sold separately)
- 7 Ground:** 26-32 screw, chassis ground lug

DM-NVX-E30C

The following illustration shows the connectors, controls, and indicators that are available on the DM-NVX-E30C.

DM-NVX-E30C

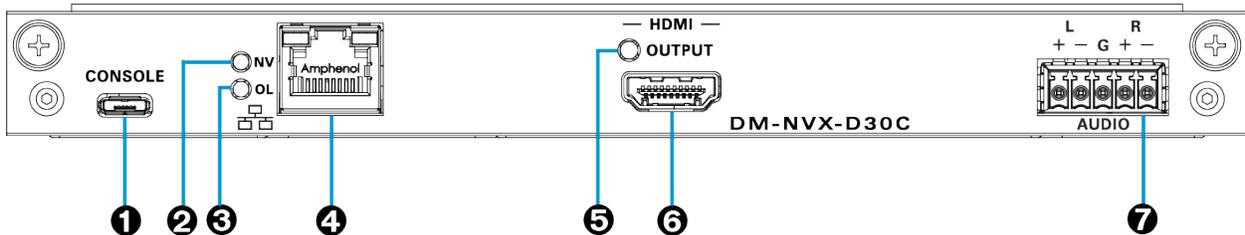


- 1** **CONSOLE:** Micro USB connector, female; USB 2.0 computer console port for setup
- 2** **NV LED:** Green LED, indicates that the device is transmitting and encoding network video
- 3** **OL LED:** Green LED, indicates an online connection to a control system via Ethernet
- 4** **Ethernet:** 8-pin RJ-45 connector, female; 100BASE-TX/1000BASE-T Ethernet port; Green LED indicates Ethernet link status; Amber LED indicates Ethernet activity
- 5** **HDMI INPUT LED:** Green LED, indicates sync detection at the HDMI input
- 6** **HDMI INPUT:** HDMI Type A connector, female; HDMI digital video/audio input (DVI and Dual-Mode DisplayPort™ interface compatible)
- 7** **AUDIO:** 5-pin 3.5 mm detachable terminal block; Balanced/unbalanced stereo line-level audio output, functional only when the card is receiving a 2-channel stereo input signal; Output Impedance: 200 Ohms balanced, 100 Ohms unbalanced; Maximum Output Level: 4 Vrms balanced, 2 Vrms unbalanced

DM-NVX-D30C

The following illustration shows the connectors, controls, and indicators that are available on the DM-NVX-D30C.

DM-NVX-D30C



- 1** **CONSOLE:** Micro USB connector, female; USB 2.0 computer console port for setup
- 2** **NV LED:** Green LED, indicates that the device is receiving and decoding network video
- 3** **OL LED:** Green LED, indicates an online connection to a control system via Ethernet
- 4** **Ethernet:** 8-pin RJ-45 connector, female; 100BASE-TX/1000BASE-T Ethernet port; Green LED indicates Ethernet link status; Amber LED indicates Ethernet activity
- 5** **HDMI OUTPUT LED:** Green LED, indicates video signal transmission at the HDMI output
- 6** **HDMI OUTPUT:** HDMI Type A connector, female; HDMI digital video/audio input (DVI compatible)
- 7** **AUDIO:** 5-pin 3.5 mm detachable terminal block; Balanced/unbalanced stereo line-level audio output, functional only when the card is receiving a 2-channel stereo input signal; Output Impedance: 200 Ohms balanced, 100 Ohms unbalanced; Maximum Output Level: 4 Vrms balanced, 2 Vrms unbalanced

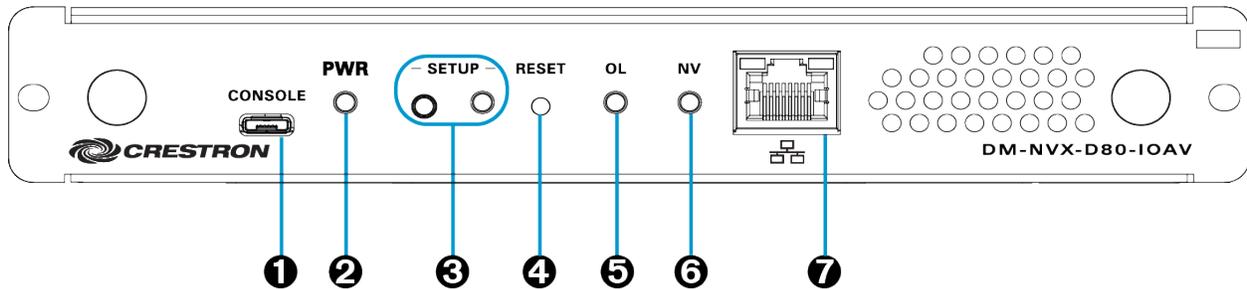
DM-NVX-D80-IOAV

This section provides information about the front and rear panels of the DM NVX D80 IOAV.

Front Panel

The following illustration shows the front panel of the DM-NVX-D80-IOAV.

DM-NVX-D80-IOAV Front Panel

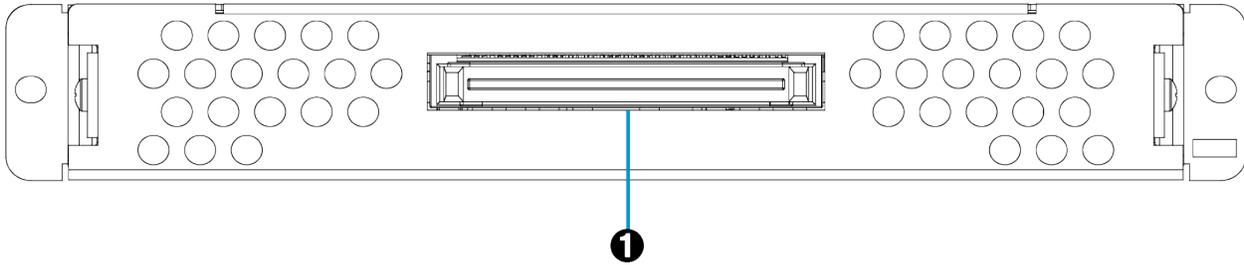


- ❶ **CONSOLE:** Micro USB connector, female; USB 2.0 computer console port for setup
- ❷ **PWR LED:** Bicolor green/amber LED, indicates operating power supplied via the OPS-supported display, lights amber while booting and green when operating
- ❸ **SETUP:** Push button for on-screen display of IP address; Red LED, indicates that the **SETUP** button is pressed and times out automatically.
- ❹ **RESET:** Recessed push button for hardware reset
- ❺ **OL LED:** Green LED, indicates an online connection to a control system via Ethernet
- ❻ **NV LED:** Green LED, indicates that the device is receiving and decoding network video
- ❼ **Ethernet:** 8-pin RJ-45 connector; 100BASE-TX/1000BASE-T Ethernet port; Green LED indicates Ethernet link status; Amber LED indicates Ethernet activity

Rear Panel

The following illustration shows the rear panel of the DM-NVX-D80-IOAV.

DM-NVX-D80-IOAV Rear Panel



- ❶ OPS: 80-pin JAE connector;
Connection for power, video, audio, RS-232, and USB control

Status and Configuration

This section provides information about viewing or configuring the following items using the web interface and SIMPL Windows as applicable:

- [DMF-CI-8 chassis details](#)
- [DM NVX Director® virtual switching appliance](#)
- [Crestron XiO Cloud® service connection](#)
- [Fan control](#)
- [Automatic point-to-point connectivity](#)
- [Stream statistics](#)
- [Image preview](#)
- [Multicast TTL \(Time-to-Live\)](#)
- [DSCP \(Differentiated Services Code Point\)](#)
- [Fixed, adaptive, or variable bit rate](#)
- [7.1 surround sound audio](#)
- [DM NAX audio over IP \(AES67\)](#)
- [Analog audio output](#)
- [Subscriptions](#)
- [EDID \(Extended Display Identification Data\)](#)
- [Background image](#)
- [Still image detection](#)
- [USB 2.0 routing](#)
- [Test pattern generator](#)
- [Enterprise-grade security](#)
- [Automatic firmware update](#)
- [IGMP snooping](#)

DMF-CI-8 Chassis Details

NOTE: DMF-CI-8 chassis details apply to the DM-NVX-E30C and DM-NVX-D30C.

A DM NVX card occupies a slot in a DMF-CI-8 chassis. Information about the chassis can be viewed using the web interface or SIMPL Windows.

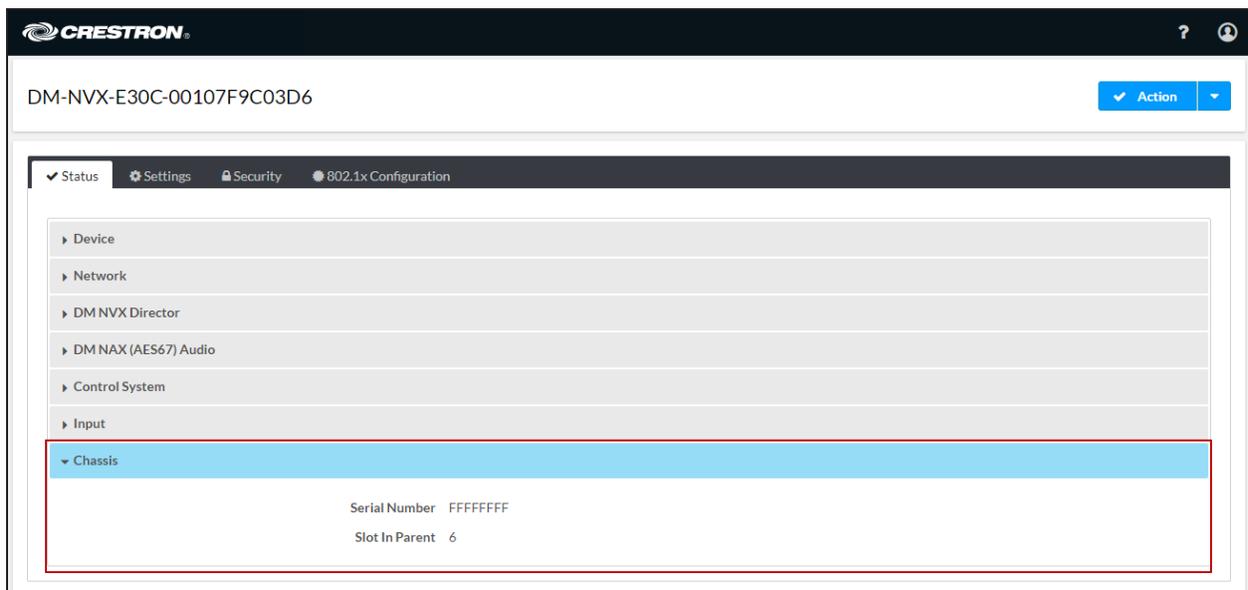
Using the Web Interface

To view DMF-CI-8 chassis information, click the **Status** tab and then click **Chassis**.

The Chassis section displays the following information:

- Serial number of the chassis
- Number of the slot into which the card is installed

Status Tab – Chassis



Using SIMPL Windows

Using the top-level programming slot for the DM NVX card, program the **<ChassisSerialNumber_F>** serial output join to report the serial number of the chassis in which the card is installed.

Program the **<CardSlotInfo_F>** serial output join to report the slot number in which the card is installed in the chassis.

DM NVX Director Virtual Switching Appliance

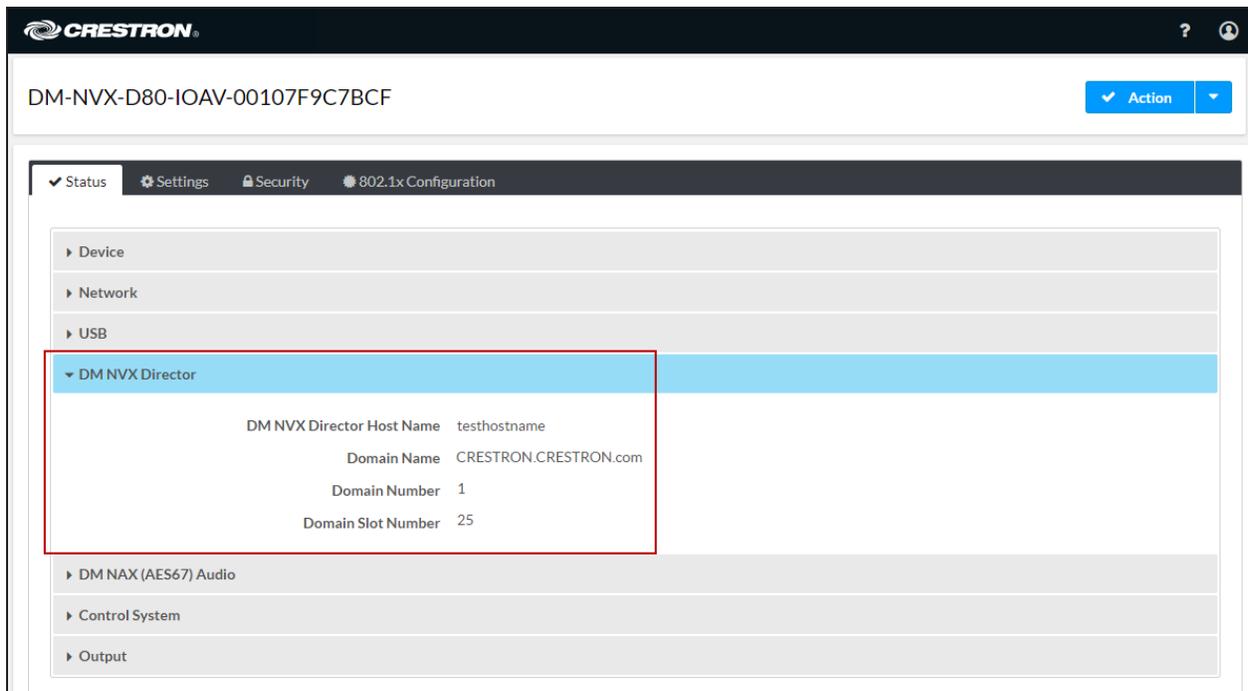
If a DM NVX device is managed by a DM NVX Director® virtual switching appliance, information about the appliance can be viewed using the web interface.

To view DM NVX Director appliance information, click the **Status** tab and then click **DM NVX Director**.

The DM NVX Director section displays the following information:

- DM NVX Director hostname
- Domain name, number, and slot number to which the DM NVX device is assigned

Status Tab – DM NVX Director



The screenshot shows the Crestron web interface for a DM NVX Director virtual switching appliance. The page title is "DM-NVX-D80-IOAV-00107F9C7BCF". The "Status" tab is selected, and the "DM NVX Director" section is expanded, showing the following configuration:

| | |
|---------------------------|-----------------------|
| DM NVX Director Host Name | testhostname |
| Domain Name | CRESTRON.CRESTRON.com |
| Domain Number | 1 |
| Domain Slot Number | 25 |

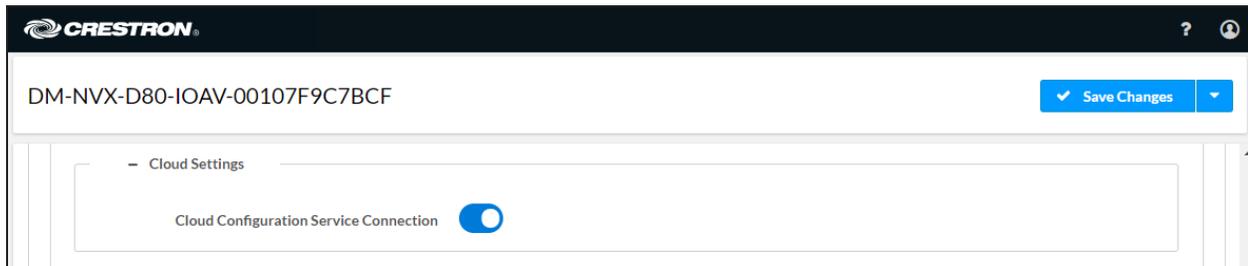
Crestron XiO Cloud Service Connection

The Crestron XiO Cloud® service enables supported Crestron devices across an enterprise to be managed and configured from one central and secure location in the cloud. Connection to the Crestron XiO Cloud service can be enabled or disabled using the web interface.

To configure the connection to the XiO Cloud service:

1. Click the **Settings** tab and then click **System Setup**.
2. In the **Cloud Settings** section, set the **Cloud Configuration Service Connection** toggle switch in the On (right) or Off (left) position. The default setting is in the On position.

Settings Tab – System Setup, Cloud Settings



For instructions about connecting to the service, refer to the [DM-NVX-E30/DM-NVX-D30 Quick Start](#) (Doc. 8211), [DM-NVX-E30C/DM-NVX-D30C Quick Start](#) (Doc. 8346), or [DM-NVX-D80-IOAV Quick Start](#) (Doc. 8526) as appropriate. For information about using the service, refer to the [XiO Cloud Provisioning and Management Service User Guide](#) (Doc. 8214).

Fan Control

NOTE: Fan control is applicable to the DM-NVX-D30 and DM-NVX-D80-IOAV.

Configure fan control or view fan status using the web interface or SIMPL Windows.

Using the Web Interface

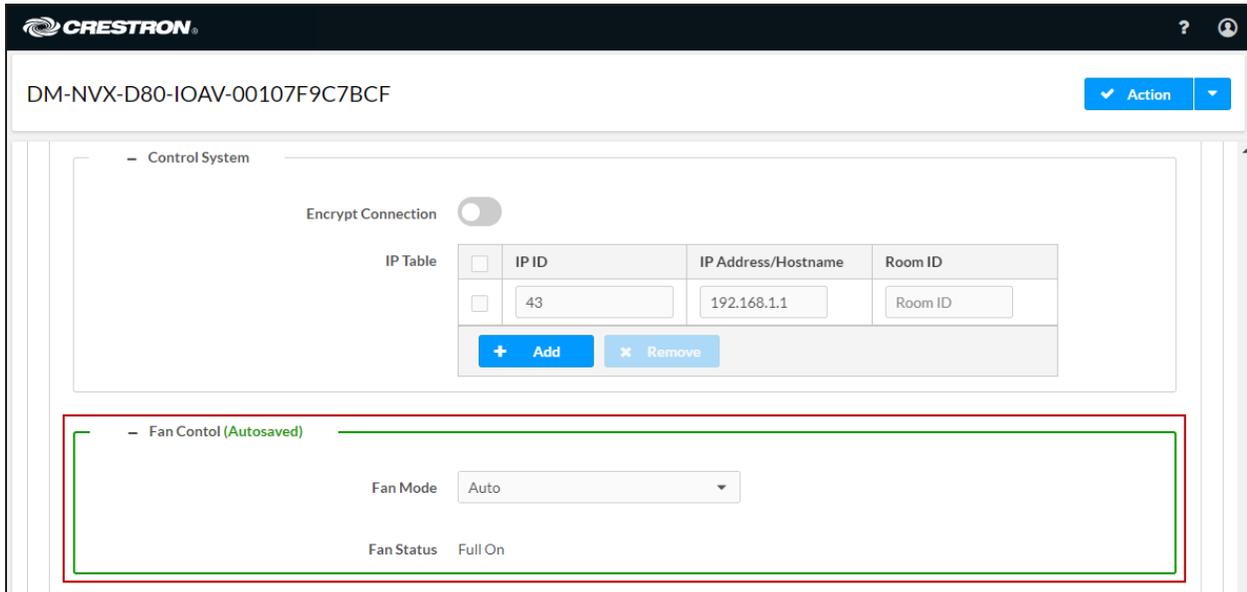
To configure fan control:

1. Click the **Settings** tab and then click **System Setup**.
2. In the **Fan Control** section, set **Fan Mode** to one of the following:
 - **Auto:** (Default setting) The fan automatically turns off when the following two conditions exist:
 - a. No video stream is present.
 - b. The internal temperature of the device does not exceed the normal operating range.
 - **Always On:** The fan runs continuously regardless of video stream status and internal temperature of the device.

Fan status is indicated as either of the following:

- **Full On:** The fan is running.
- **Off:** The fan is not running.

Settings Tab – System Setup, Fan Control



Using SIMPL Windows

Using the top-level programming slot for the device, set the **<FanControl>** analog input join to the desired setting. The **<FanControl_F>** analog output join reports the fan mode of operation. The **<FanStatus_F>** analog output join reports the fan status. For additional information, refer to the SIMPL Windows help file.

Automatic Point-to-Point Connectivity

Point-to-point connectivity enables a DM NVX 4K60 4:4:4 encoder to be connected directly to a DM NVX 4K60 4:4:4 decoder to stream video, audio, and, if applicable, USB signals. Rather than being connected to an Ethernet switch, a 1000BASE-T Ethernet port of an encoder is connected directly to a 1000BASE-T port of a decoder. By default, point-to-point mode is enabled (set to **Auto**) and can be disabled if desired. When enabled, no additional configuration is required for the encoder or decoder to operate in point-to-point mode.

To enable or disable point-to-point mode, use the web interface or SIMPL Windows as discussed in the following sections.

Using the Web Interface

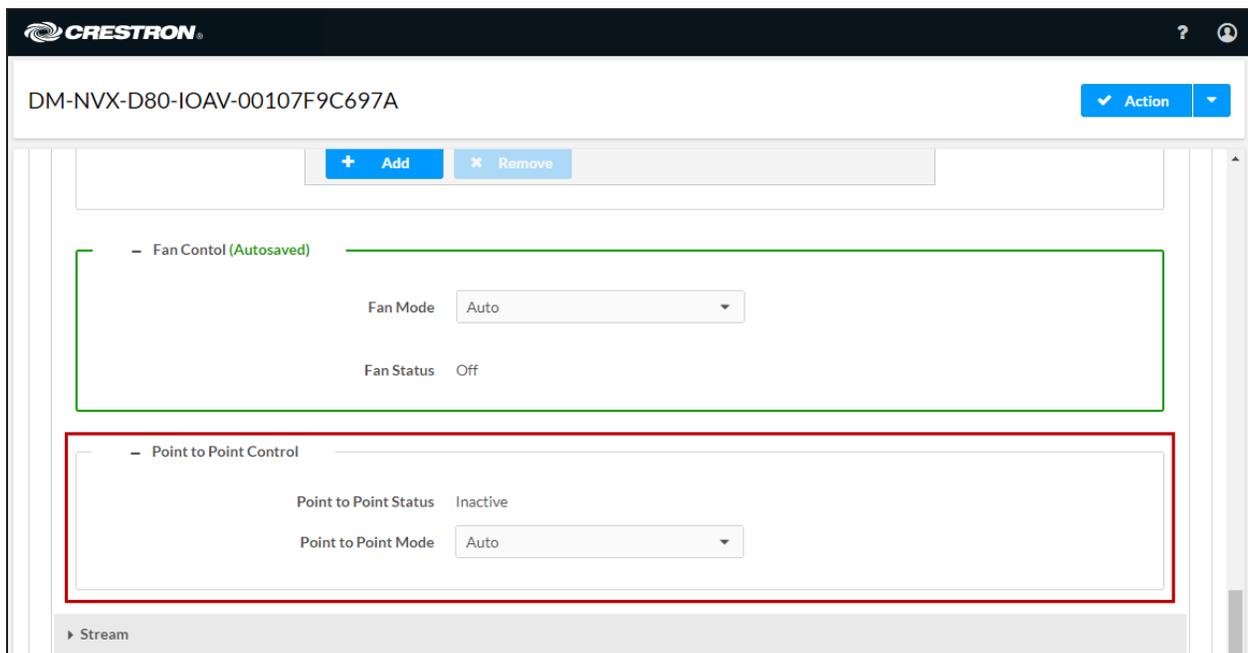
Enable or disable point-to-point mode by clicking the **Settings** tab and then clicking **System Setup**.

In the **Point-to-Point Control** section, **Point to Point Status** indicates whether point-to-point mode is **Active** or **Inactive**.

In the **Point-to-Point Mode** drop-down list, select either of the following:

- **Auto:** (Default setting) A 1000BASE-T port of a DM NVX 4K60 4:4:4 encoder detects a direct connection to a DM NVX 4K60 4:4:4 decoder or a connection to a 1000BASE-T switch. Similarly, a 1000BASE-T port of a DM NVX 4K60 4:4:4 decoder detects a direct connection to a DM NVX 4K60 4:4:4 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.
- **Disable:** Disables point-to-point mode

Settings Tab - System Setup, Point-to-Point Control (DM-NVX-D80-IOAV Shown)



Using SIMPL Windows

Using the top-level programming slot for the DM-NVX device, set the **<PointToPointMode>** analog input join to the desired value. For additional information, refer to the SIMPL Windows help file.

Stream Statistics

Statistics can be displayed to indicate the number of packets received or transmitted, the number of dropped packets, and the bit rate of the received stream.

NOTE: The bit rate of the stream is displayed for the DM-NVX-D30, DM-NVX-D30C, and DM-NVX-D80-IOAV.

To enable or disable or to reset stream statistics, use the web interface or SIMPL Windows as discussed in the following sections.

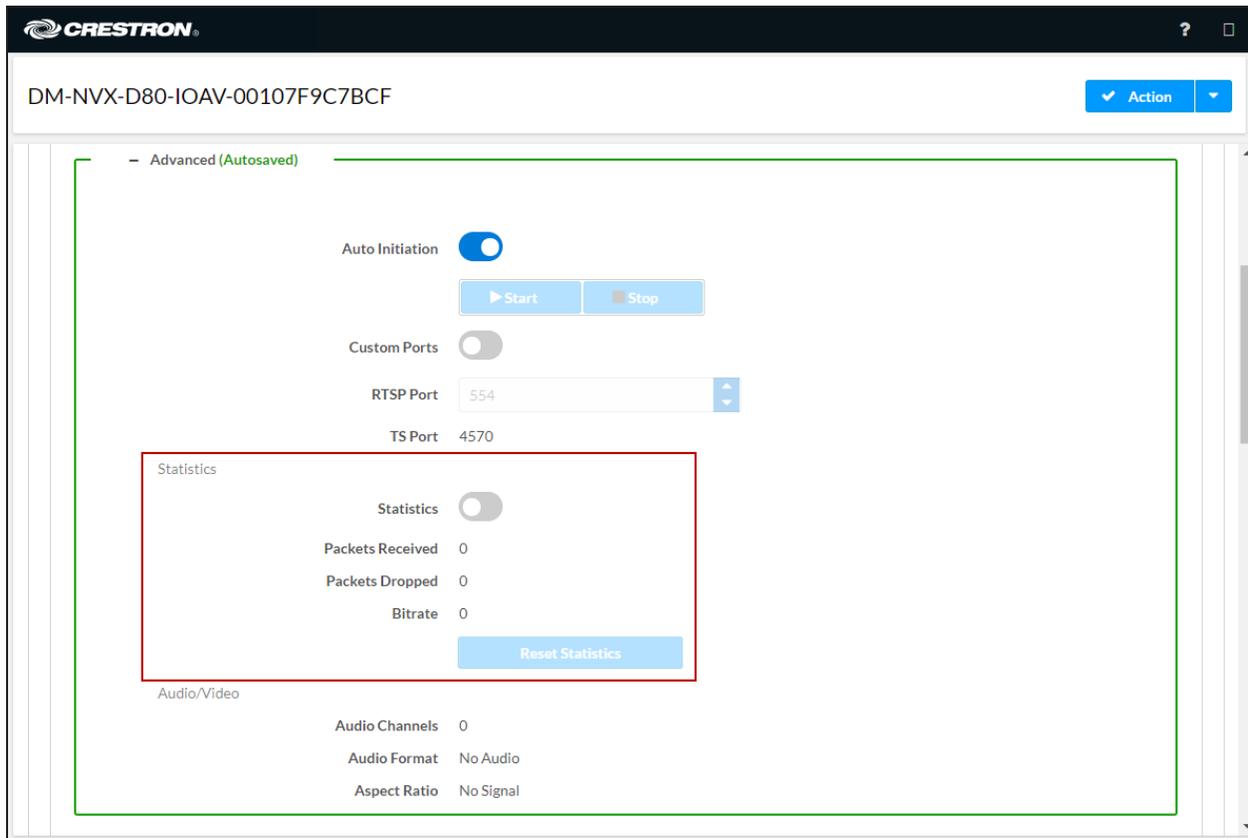
Using the Web Interface

To enable, disable, or reset stream statistics:

1. Click the **Settings** tab and then click **Stream**.
2. In the **Advanced** section:
 - To enable or disable **Statistics**, set the **Statistics** toggle switch in the On (right) or Off (left) position, respectively. The default setting is in the Off (left) position.
 - To reset statistics, click **Reset Statistics**.

For additional information, refer to the online help of the web interface.

Settings Tab - Stream, Advanced, Statistics



Using SIMPL Windows

For the DM-NVX-E30 and DM-NVX-E30C, configure stream statistics in **Slot-01: Stream Transmit**. For the DM-NVX-D30, DM-NVX-D30C, and DM-NVX-D80-IOAV, configure stream statistics in **Slot-02: Stream Receive**. Trigger the **<StatisticsEnabled>** digital input join to enable the reporting of statistics. To disable statistics, trigger the **<StatisticsDisabled>** digital input join. To clear the statistics, trigger the **<ResetStatistics>** digital input join. The corresponding serial joins are updated when the digital input joins are triggered. For additional information, refer to the SIMPL Windows help file.

Image Preview

NOTE: Image preview functionality is applicable to the DM-NVX-E30, DM-NVX-E30C, DM-NVX-D30, and DM-NVX-D30C.

Image preview provides still images (thumbnails) that show the current video being received by an input of a DM NVX transmitter or displayed by an output of a DM NVX receiver. Still images are shown at one frame per second. Image preview supports the maximum resolution of the source and scales the image while maintaining the aspect ratio. Images can be previewed in the DM NVX web interface and accessed remotely using a web browser. The images can also be previewed on a Crestron touch screen or third-party interface.

To configure image preview, use the web interface or SIMPL Windows as discussed in the following sections.

Using the Web Interface

To configure image preview:

1. Click the **Settings** tab and then click **Stream**.
2. Under **Services**, enable **Preview Output** if it is disabled by setting the **Preview Output** toggle switch in the On (right) position (default setting). If video is present, video is displayed in the Preview window above **Services**. (Double-clicking the Preview window displays the video window full screen.)
3. Enter a base file name (prefix) to the file name of the images to be generated. The default base file name is **preview**.

The **Generated Preview Images** table lists the image previews. **Type** indicates the height of the image in pixels. **File Name** indicates the file name of the image in the following format:

<base file name>_<vertical resolution>px.<extension>

- **<base file name>** is the prefix assigned to the image preview followed by an underscore. If the default base file name of preview is changed, clicking the table updates the base name in the table.
- **<vertical resolution>** is the height of the image in pixels (px).
- **<extension>** is the file format of the image. The default file extension is .jpeg.

For example, using the default base file name, which is **preview**, and a JPEG image with a vertical resolution of 240 pixels, the file name of the image preview is **preview_240px.jpeg**.

Local Preview Path indicates the **/preview** location to which image preview files are saved to the web server of the DM NVX device. An image preview file can be accessed from a web browser on a remote device by entering the following URL:

https://<username>:<password>@<ip address>/preview/<filename>

- **<username>** is the user name used to access the DM NVX web server.
- **<password>** is the password used to access the DM NVX web server.
- **<ip address>** is the IP address of the DM NVX device.
- **<filename>** is the file name of the image preview file.

For example:

https://admin:admin@172.30.160.90/preview/preview_540px.jpeg

- **admin** is the user name used to access the DM NVX web server.
- **admin** is the password used to access the DM NVX web server.
- **172.30.160.90** is the IP address of the DM NVX device.
- **preview_540px.jpeg** is the file name of the image preview file.

Settings Tab - Stream, Image Preview (Sample Image Shown)

DM-NVX-E30-00107FB58454

Status Stream started
Resolution 3840x2160@60

Preview

Services (Autosaved)

Preview Settings

Preview Output

Base File Name

| Generated Preview Images | Type | File Name |
|--------------------------|-------|--------------------|
| | 135px | preview_135px.jpeg |
| | 270px | preview_270px.jpeg |
| | 540px | preview_540px.jpeg |

Local Preview Path /preview

Using SIMPL Windows

Enable or disable image preview functionality in **Slot-1003: DM Preview Image**. Trigger the **<Enable>** digital input join to enable image preview functionality. To disable image preview functionality, trigger the **<Disable>** digital input join. For additional information, refer to the SIMPL Windows help file.

Multicast TTL (Time-to-Live)

NOTE: Multicast TTL configuration is applicable to the DM-NVX-E30 and DM-NVX-E30C.

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.

Multicast TTL can be set to any value ranging from **1** to **255**. The default setting is **5**.

To set a multicast TTL value, use the web interface or SIMPL Windows.

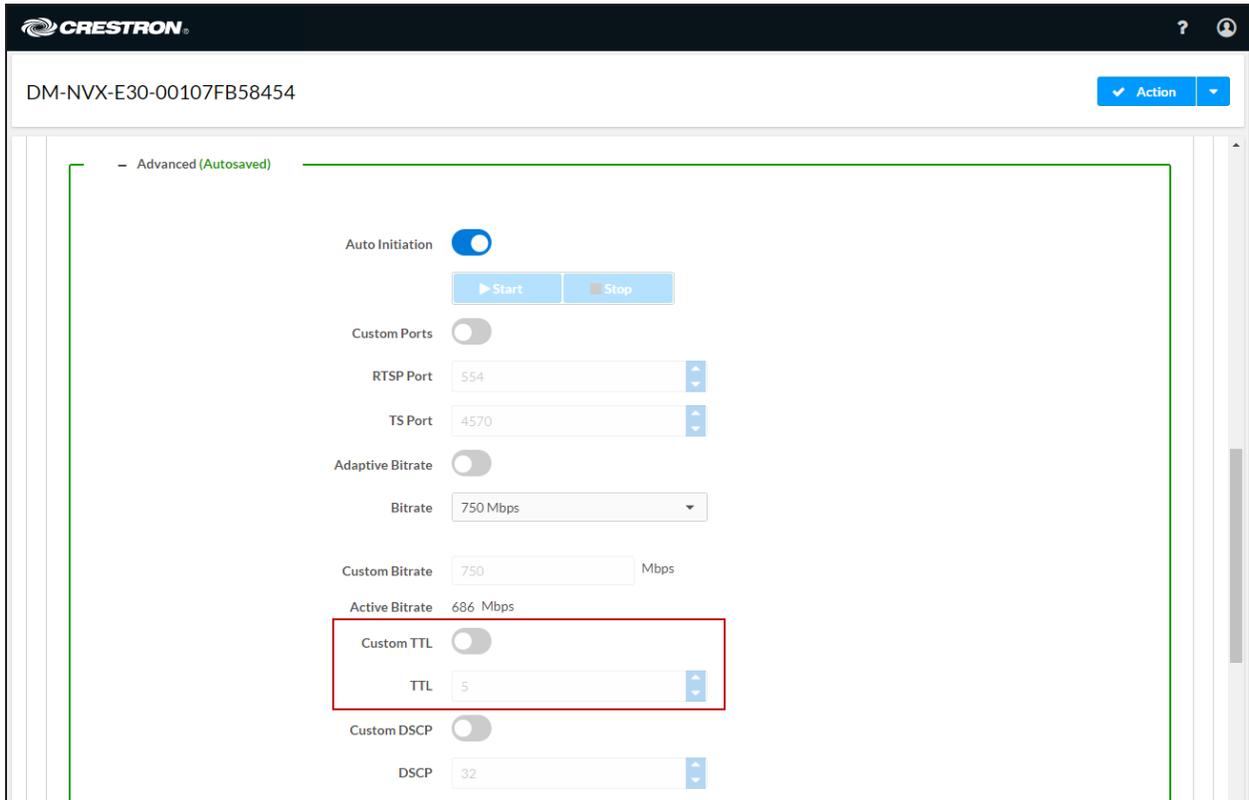
Using the Web Interface

Configure multicast TTL by clicking the **Settings** tab and then clicking **Stream**. In the **Advanced** section, set a multicast TTL value:

1. Disable **Auto Initiation** by setting the **Auto Initiation** toggle switch in the Off (left) position.
2. Stop the stream by clicking **Stop**.
3. Enable **Custom TTL** by setting the **Custom TTL** toggle switch in the On (right) position.
4. In the **TTL** text box, enter the desired TTL value (**1** to **255**). The default setting is **5**.
5. Enable **Auto Initiation** by setting the **Auto Initiation** toggle switch in the On (right) position. The stream automatically restarts.

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

Settings Tab - Stream, Advanced, Custom TTL



Using SIMPL Windows

Configure multicast TTL as follows:

1. Using the top-level programming slot:
 - a. Trigger the **<AutomaticInitiationDisabled>** digital input join.
 - b. Trigger the **<Stop>** digital input join.
2. In **Slot-01: Stream Transmit**, set the **<MulticastTTL>** analog input join to the desired value (1 to 255).
3. Using the top-level programming slot, trigger the **<AutomaticInitiationEnabled>** digital input join. The stream automatically restarts.

For additional information, refer to the SIMPL Windows help file.

DSCP (Differentiated Services Code Point)

NOTE: DSCP configuration is applicable to the DM-NVX-E30 and DM-NVX-E30C.

To implement Quality of Service (QoS), IP networks use the DSCP 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, DSCP is set to **32**.

NOTE: Change the DSCP default setting of **32** only if required by IT department policies.

To configure DSCP:

1. Click the **Settings** tab and then click **Stream**.
2. In the **Advanced** section:
 - a. Disable **Auto Initiation** by setting the **Auto Initiation** toggle switch in the Off (left) position.
 - b. Stop the stream by clicking **Stop**.
 - c. Enable **Custom DSCP** by setting the **Custom DSCP** toggle switch in the On (right) position.
 - d. In the **DSCP** text box, enter the desired DSCP value (**0** to **63**).
 - e. Enable **Auto Initiation** by setting the **Auto Initiation** toggle switch in the On (right) position. The stream automatically restarts.

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

Settings Tab - Stream, Advanced, Custom DSCP

The screenshot displays the Crestron web interface for the device DM-NVX-E30-00107FB58454. The interface is titled "Advanced (Autosaved)" and contains the following settings:

- Auto Initiation:** Enabled (toggle switch). Includes "Start" and "Stop" buttons.
- Custom Ports:** Disabled (toggle switch).
- RTSP Port:** 554 (dropdown menu).
- TS Port:** 4570 (dropdown menu).
- Adaptive Bitrate:** Disabled (toggle switch).
- Bitrate:** 750 Mbps (dropdown menu).
- Custom Bitrate:** 750 Mbps (input field).
- Active Bitrate:** 686 Mbps (text display).
- Custom TTL:** Disabled (toggle switch).
- TTL:** 5 (dropdown menu).
- Custom DSCP:** Disabled (toggle switch).
- DSCP:** 32 (dropdown menu).

The "Custom DSCP" section, including the toggle and the "DSCP" dropdown, is highlighted with a red rectangular box.

Fixed, Adaptive, or Variable Bit Rate

NOTE: A fixed, adaptive, or variable bit rate setting is applicable to the DM-NVX-E30 and DM-NVX-E30C. A nonblocking network is required.

For a DM NVX 4K60 4:4:4 encoder, the bit rate of a stream can be set to fixed, adaptive, or variable:

- 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 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 a user-specified fixed bit rate.

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

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 |
| 3840x2160@24 Hz (4k24) | 199,065,600 | 470 |
| 3840x2160@25 Hz (4k25) | 207,360,000 | 477.777778 |
| 3840x2160@30 Hz (4k30) | 248,832,000 | 516.666667 |
| 3840x2160@50 Hz (4k50) | 414,720,000 | 672.222222 |
| 3840x2160@60 Hz (4k60) | 497,664,000 | 750 |
| 4096x2160@50 Hz (DCI50) | 442,368,000 | 698.148148 |
| 4096x2160@60 Hz (DCI60) | 530,841,600 | 781.111111 |

- Variable bit rate (VBR) enables the encoder to automatically vary the bit rate based on the content and input resolution of the stream. The bit rate can vary from less than 150 Mbps to a maximum of 750 Mbps. A variable bit rate results in the use of less bandwidth to produce the same image quality as a user-specified fixed bit rate or an adaptive bit rate.

Set the bit rate type using the web interface or SIMPL Windows.

Using the Web Interface

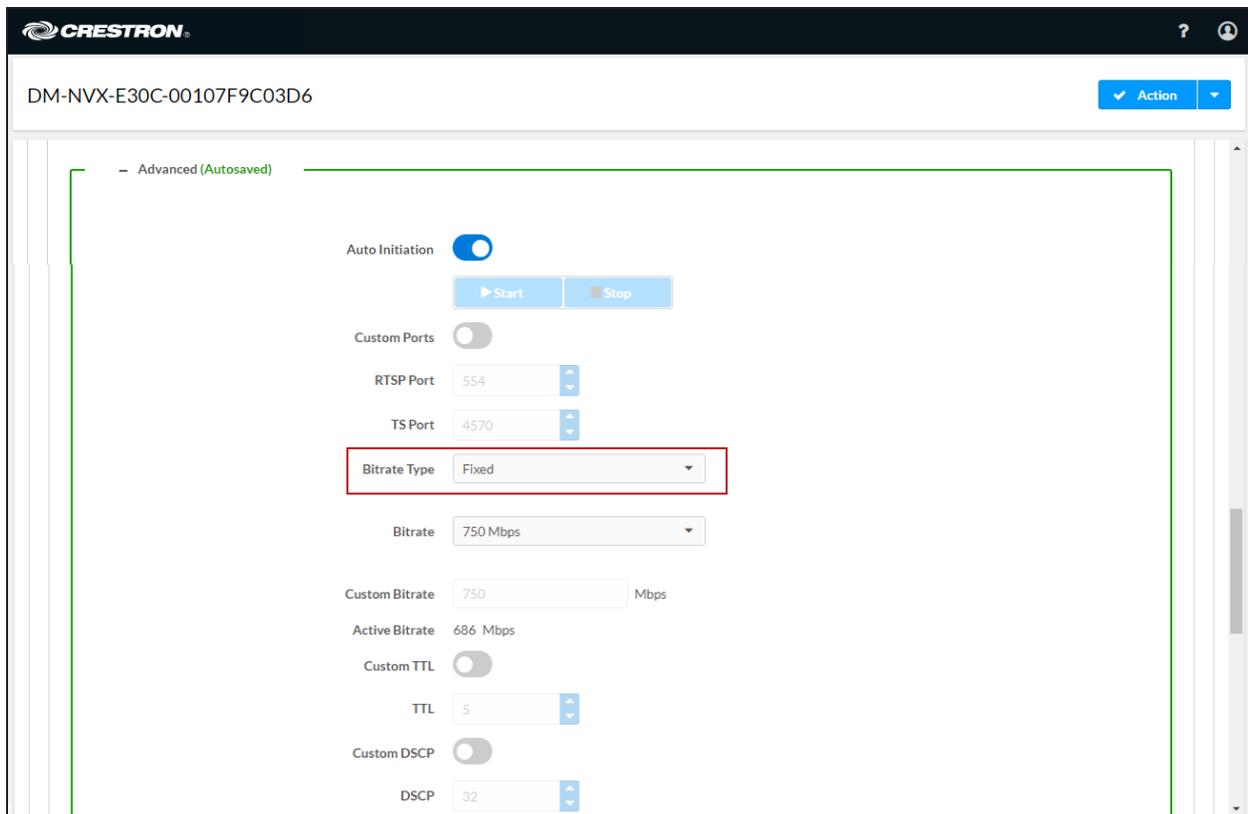
To set the bit rate:

1. Click the **Settings** tab and then click **Stream**.
2. In the **Advanced** section, select the bit rate type in the **Bitrate Type** drop-down list: **Fixed**, **Adaptive**, or **Variable**.

If **Fixed** is selected, select a bit rate in the **Bitrate** drop-down list. If **Custom** is selected as the **Fixed** bit rate, enter a custom bit rate value in the **Custom Bitrate** text box. The custom bit rate must be a value ranging from 200 Mbps to 950 Mbps.

NOTE: For 4K60 video, a bit rate below 350 Mbps may display a black screen.

Settings Tab - Stream, Advanced, Bitrate Type



Using SIMPL Windows

In **Slot-01: Stream Transmit**, set the **<BitrateType>** analog input join to the desired bit rate type (**Constant Bitrate [Default]**, **ABR**, or **VBR**). For additional information, refer to the SIMPL Windows help file.

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.

To configure 7.1 surround sound audio, set the desired EDID. Refer to [EDID \(Extended Display Identification Data\)](#) (on page 35) for additional information.

DM NAX Audio over IP (AES67)

DM NAX™ audio over IP supports the AES67 standard. AES67 support allows the selected audio source to be transmitted as a 2-channel AES67 stream while another 2-channel AES67 audio stream is received from a Crestron DSP or other third-party device.

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

To configure DM NAX (AES67) audio, use the web interface or SIMPL Windows as discussed in the following sections.

Using the Web Interface

Configure DM NAX (AES67) audio by clicking the **Settings** tab and then configuring DM NAX (AES67) audio and routing:

- The **DM NAX (AES67) Audio** section varies depending on whether the DM NVX endpoint is a transmitter or receiver. For the DM-NVX-E30 and DM-NVX-E30C, refer to [Configuring-DM-NAX-\(AES67\)-Audio-for-a-DM-NVX-Transmitter](#). For the DM-NVX-D30, DM-NVX-D30C, and DM-NVX-D80-IOAV, refer to [Configuring_DM_NAX_\(AES67\)_Audio_for_a_DM_NVX_Receiver](#).
- The **Routing** section enables the appropriate settings to be configured for DM NAX (AES67) audio. Refer to [Configuring_DM_NAX_\(AES67\)_Audio_Routing](#).

Configuring DM NAX (AES67) Audio for a DM NVX Transmitter

NOTE: This section is applicable to the DM-NVX-E30 and DM-NVX-E30C.

In the **DM NAX (AES67) Audio** section under the **Settings** tab:

- In the **DM NAX (AES67) Transmit** section, select the desired setting in the **Mode** drop-down list: **Automatic**, **Disabled**, or **Manual**. The default setting is **Automatic**, which 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.

If **Mode** is set to **Manual**, enter the desired multicast address and port number.

- In the **DM NAX (AES67) Transmit Advanced** section, set the **Auto Initiation** toggle switch in the On (right) position or Off (left) position. By default, **Auto Initiation** is set to **On**. If **Auto Initiation** is set to **Off**, start or stop the stream as desired.

The following AES67 audio stream information is displayed: status, encoding format, encoding sample rate, bit rate, and number of channels.

- In the **DM NAX (AES67) Receive** section, enter the multicast address and port number.
- In the **DM NAX (AES67) Receive Advanced** section, set the **Auto Initiation** toggle switch in the On (right) position or Off (left) position. By default, **Auto Initiation** is set to **On**. If **Auto Initiation** is set to **Off**, start or stop the stream as desired.

The following AES67 audio stream information is displayed: status, encoding format, encoding sample rate, bit rate, and number of channels.

Settings Tab - DM NAX (AES67) Audio Configuration for a DM NVX Transmitter

The screenshot displays the Crestron web interface for configuring DM NAX (AES67) audio. The device ID is DM-NVX-E30-00107FB58454. The configuration is organized into four sections:

- DM NAX (AES67) Transmit (Autosaved):** Mode is set to Automatic. Multicast Address is 239.8.128.97. Port is 4570.
- DM NAX (AES67) Transmit Advanced (Autosaved):** Auto Initiation is enabled. Start and Stop buttons are present. Status is Stream Started. Encoding Format is LPCM. Encoding Sample Rate is 48000. Bitrate is 3072. Channels are 2.
- DM NAX (AES67) Receive (Autosaved):** Multicast Address is 0.0.0.0. Port is 5004.
- DM NAX (AES67) Receive Advanced (Autosaved):** Auto Initiation is enabled. Start and Stop buttons are present. Status is Stream Stopped. Encoding Format is LPCM. Encoding Sample Rate is 48000. Bitrate is 3072. Channels are 2.

For additional information, refer to the online help of the web interface.

Configuring DM NAX (AES67) Audio for a DM NVX Receiver

NOTE: This section is applicable to the DM-NVX-D30, DM-NVX-D30C, and DM-NVX-D80-IOAV.

In the **DM NAX (AES67) Audio** section under the **Settings** tab:

- In the **DM NAX (AES67) Transmit** section, enter the multicast address and port number.
- In the **DM NAX (AES67) Transmit Advanced** section, set the **Auto Initiation** toggle switch in the On (right) position or Off (left) position. By default, **Auto Initiation** is set to **On**. If **Auto Initiation** is set to **Off**, start or stop the stream as desired.

The following AES67 audio stream information is displayed: status, encoding format, encoding sample rate, bit rate, and number of channels.

- In the **DM NAX (AES67) Receive** section, select the desired setting in the **Mode** drop-down list: **Automatic**, **Disabled**, or **Manual**. The default setting is **Automatic**, which 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.

If **Mode** is set to **Manual**, enter the desired multicast address and port number.

- In the **DM NAX (AES67) Receive Advanced** section, set the **Auto Initiation** toggle switch in the On (right) position or Off (left) position. By default, **Auto Initiation** is set to **On**. If **Auto Initiation** is set to **Off**, start or stop the stream as desired.

The following AES67 audio stream information is displayed: status, encoding format, encoding sample rate, bit rate, and number of channels.

Settings Tab - DM NAX (AES67) Audio Configuration for a DM NVX Receiver

The screenshot shows the Crestron web interface for configuring DM NAX (AES67) audio on a DM NVX receiver. The device ID is DM-NVX-E30-00107FB58454. The settings are organized into four sections:

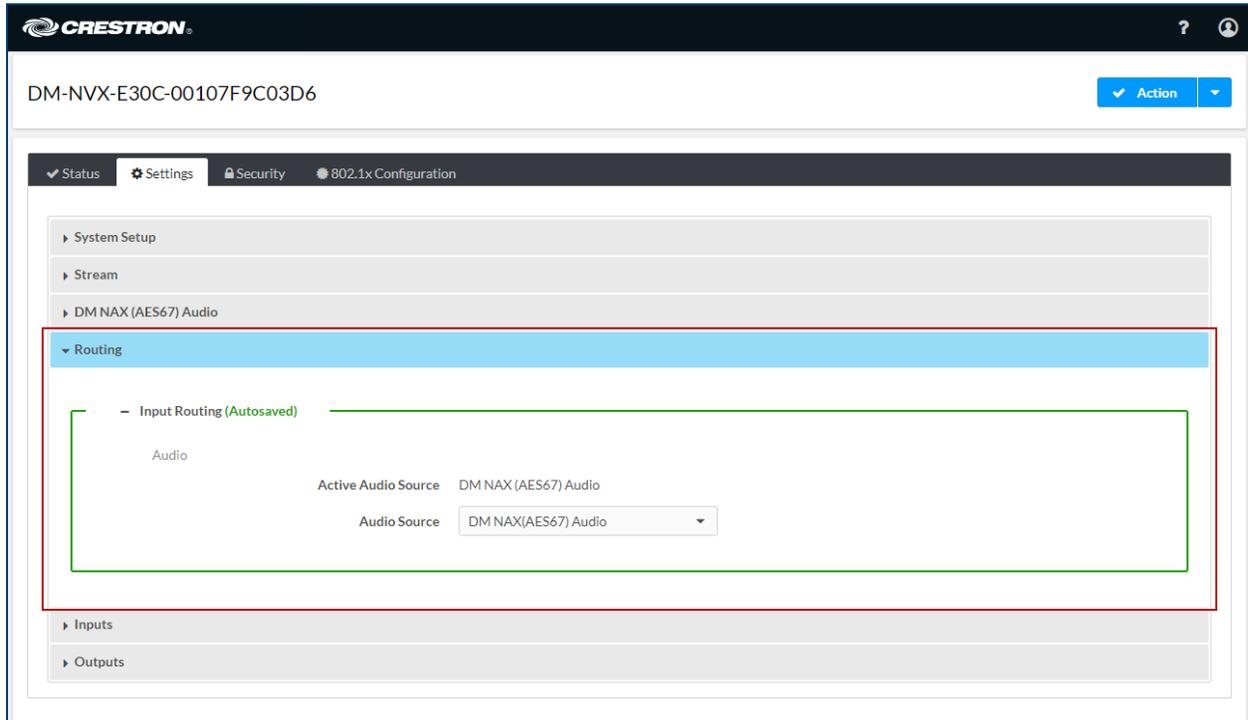
- DM NAX (AES67) Transmit (Autosaved):** Multicast Address: 239.200.200.7, Port: 5004.
- DM NAX (AES67) Transmit Advanced (Autosaved):** Auto Initiation: . Start/Stop buttons are present. Status: Stream Started. Encoding Format: LPCM, Encoding Sample Rate: 48000, Bitrate: 3072, Channels: 2.
- DM NAX (AES67) Receive (Autosaved):** Mode: Automatic. Multicast Address: 0.0.0.0, Port: 4570.
- DM NAX (AES67) Receive Advanced (Autosaved):** Auto Initiation: . Start/Stop buttons are present. Status: Stream Stopped. Encoding Format: LPCM, Encoding Sample Rate: 48000, Bitrate: 3072, Channels: 2.

Configuring DM NAX (AES67) Audio Routing

To configure DM NAX (AES67) audio routing:

1. Click the **Settings** tab and then click **Routing**.
2. In the **Input Routing** section, set **Audio Source** to **DM NAX (AES-67) Audio**.

Settings Tab – Routing, DM NAX (AES67) Routing



Using SIMPL Windows

Using the top-level programming slot for the DM NVX device, set the **<AudioSource>** analog input join to **DM NAX (AES67) audio** as the audio source for the network video stream or HDMI output.

For a DM NVX transmitter or receiver, configure DM NAX (AES67) audio in **Slot-18: DM NAX (AES67) Routing**. In order for a DM NVX device to transmit DM NAX (AES67) audio, configure DM NAX (AES67) audio in **Slot-18-01: DM NAX (AES67) TX**. In order for the DM NVX device to receive DM NAX (AES67) audio, configure DM NAX (AES67) audio in **Slot-18-33: DM NAX (AES67) RX**. For additional information, refer to the SIMPL Windows help file.

Analog Audio Output

NOTE: Analog audio output configuration is applicable to the DM-NVX-E30, DM-NVX-E30C, DM-NVX-D30, and DM NVX-D30C.

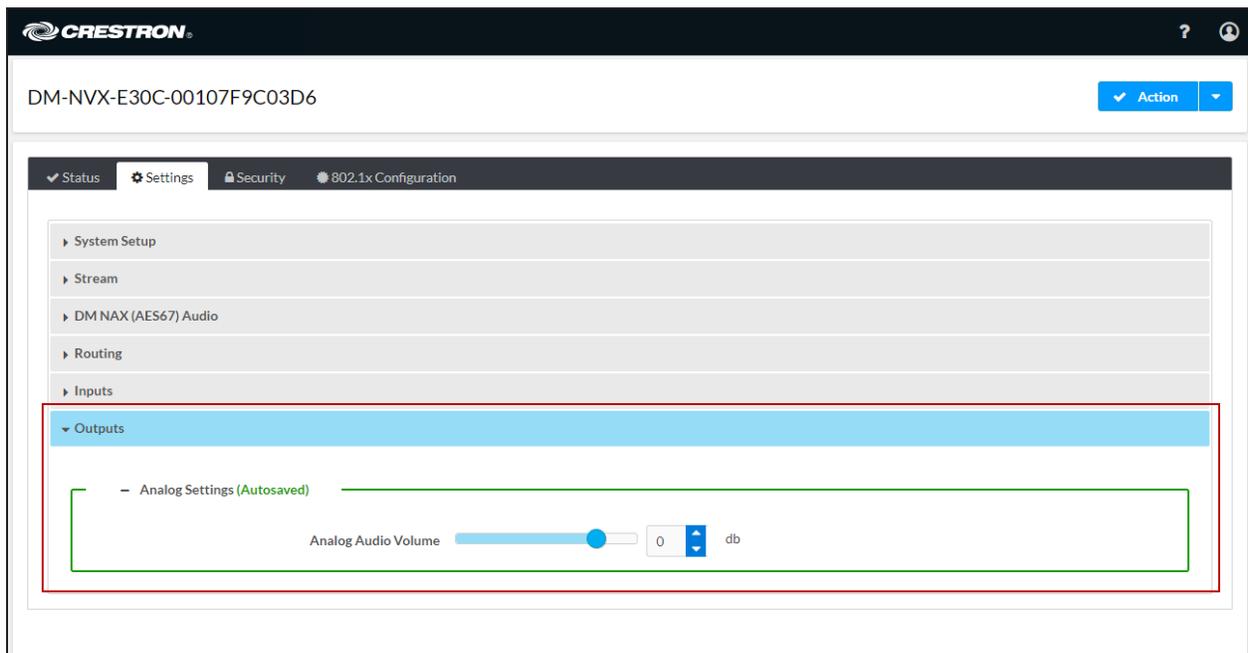
The analog audio output can provide a stereo line-level signal to feed a local sound system or sound bar. The output volume is adjustable via the web interface or SIMPL Windows.

Using the Web Interface

To configure the volume of the analog audio output:

1. Click the **Settings** tab and then click **Outputs**.
2. In the **Analog Settings** section, set **Analog Audio Volume** to the desired volume.

Settings Tab – Outputs, Analog Settings



For additional information, refer to the online help of the web interface.

Using SIMPL Windows

Using the top-level programming slot for the DM NVX device, set the **<AnalogAudioOutputVolume>** analog input join to the desired volume. For additional information, refer to the SIMPL Windows help file.

Subscriptions

NOTE: Subscription configuration is applicable to the DM-NVX-D30, DM-NVX-D30C, and DM-NVX-D80-IOAV.

Subscription of a DM NVX encoder to a DM NVX decoder sets up Real Time Streaming Protocol (RTSP) negotiation between the DM NVX decoder and the DM NVX 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, use the web interface or SIMPL Windows as discussed in the following sections.

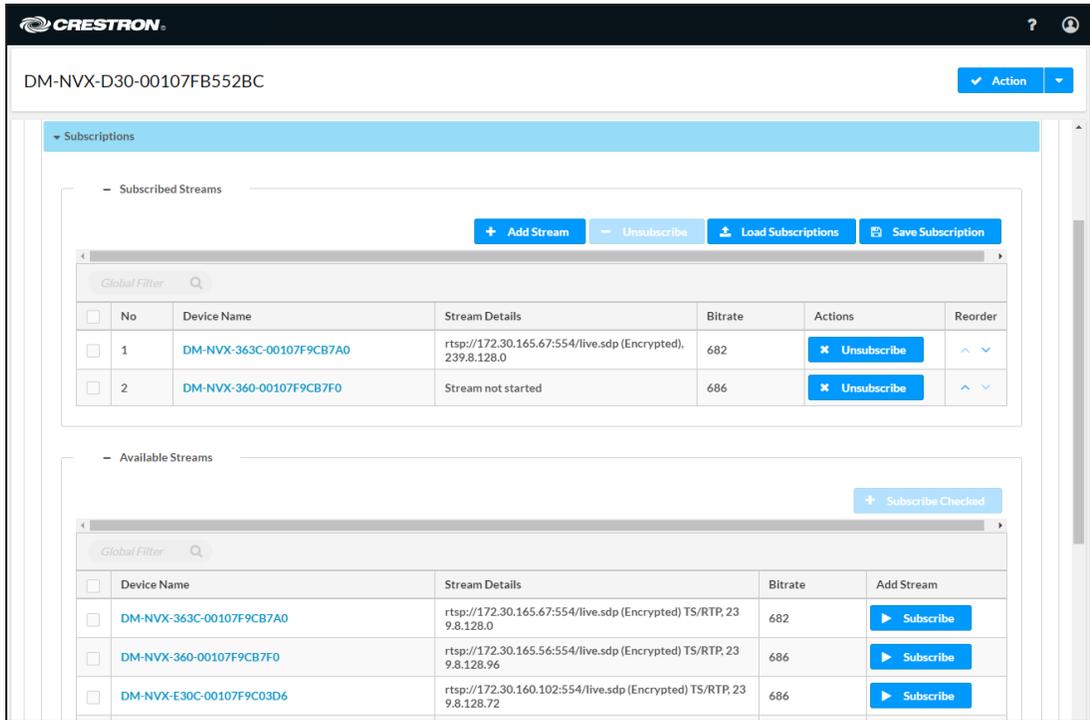
Using the Web Interface

To configure subscriptions:

1. Click the **Settings** tab and then click **Subscriptions**.
2. Do either of the following:
 - In the **Subscribed Streams** section, manually add each encoder that is to be subscribed to the decoder or load one or more existing subscription lists (*.xml). The default filename of the subscription list is subscription.xml.

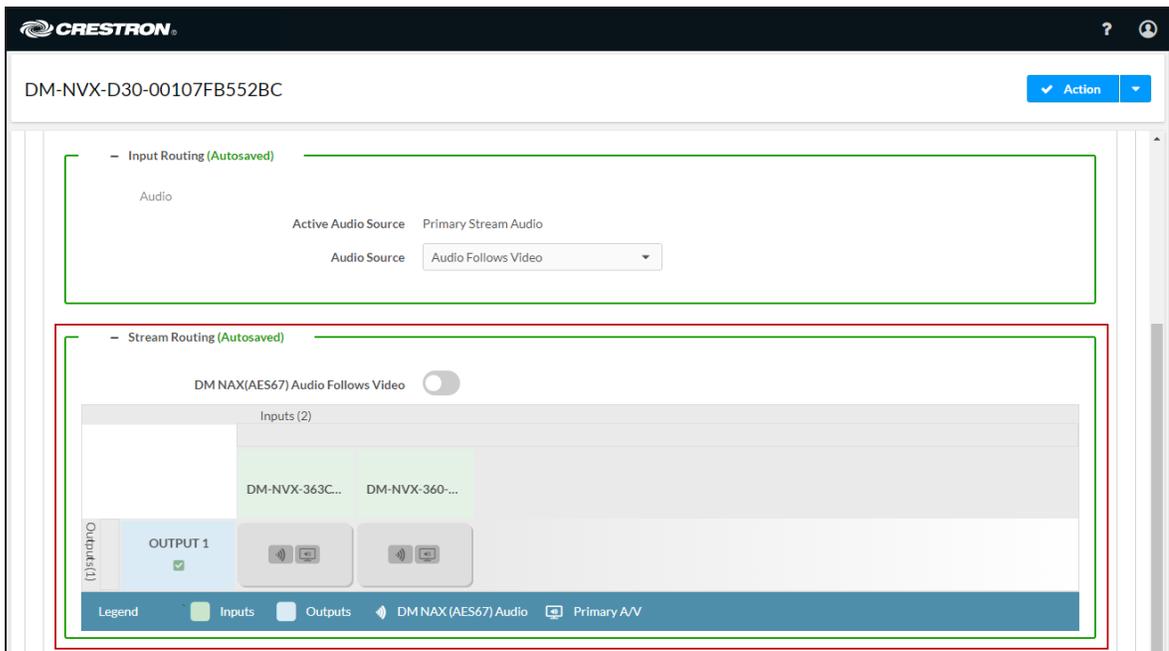
NOTE: Subscribed transmitters can be reordered in the list. To do so, click the Move Up or Move Down icon in the **Reorder** column until the transmitter appears in the desired location in the list.
 - In the **Available Streams** section, click **Subscribe Checked** or **Subscribe** for the encoders that are to be subscribed to the decoder.

Settings Tab – Subscriptions



- Under the **Settings** tab, click **Routing**. In the **Stream Routing** section, select the desired encoder to be routed to the decoder.

Settings Tab – Routing, Stream Routing



For additional information, refer to the online help of the web interface.

Using SIMPL Windows

NOTE: Selection of the encoders for subscription or selection of subscription lists can be performed using the web interface only.

Manually select a subscribed encoder for routing in **Slot-1000: XIO Routing**. Set the **<VideoOut>** analog input join to the desired encoder. For additional information, refer to the SIMPL Windows help file.

EDID (Extended Display Identification Data)

NOTE: EDID configuration is applicable to the DM-NVX-E30 and DM-NVX-E30C.

EDID configuration enables management of the EDID that is to be sent to the upstream device connected to the HDMI input of the DM NVX device. If an EDID other than the default EDID is desired, use the web interface to configure the EDID.

To view a list of default or user EDID files, search for an EDID file, or add or delete user EDID files, go to the **Action** menu in the upper-right corner of the web interface and select **EDID Management**.

Action Menu - EDID Management

The screenshot displays the Crestron web interface for a device with ID DM-NVX-E30-00107FB58454. The interface includes a navigation bar with tabs for Status, Settings, Security, and 802.1x Configuration. The 'Device' section is active, showing details for Model (DM-NVX-E30), Serial Number (2038CRX02075), and Firmware Version (5.1.4651.00025). A 'More Details' section is expanded, showing various system parameters such as Build, Updater, Bootloader, CCUI Version, Build time, Product ID, and Revision ID. The 'HDCP2X-SKE' and 'NIOS' sections are also visible. An 'Action' menu is open on the right side, listing options: Reboot, Restore, Update Firmware, Download Logs, Manage Certificates, EDID Management (highlighted with a red box), Save Changes, and Revert.

To select an EDID for the input:

1. Click the **Settings** tab and then click **Inputs**.
2. In the **Inputs** table, click the **Edit** button.
3. In the **EDID** section, select the desired EDID.

Settings Tab – Inputs, EDID Configuration

The screenshot displays the Crestron web interface for device DM-NVX-E30C-00107F9C03D6. The 'Settings' tab is active, and the 'Inputs' section is expanded. A table lists the input configurations, with 'INPUT 1' selected. A red arrow points to the 'Edit' button in the 'Actions' column of the table.

| Name | Sync Detected | EDID | HDCP Receiver Capability | Actions |
|---------|---------------|----------------------|--------------------------|----------------------|
| INPUT 1 | Yes | 4K60 444 2CH Non-HDR | Auto | Edit |

The 'Edit Input' dialog box is open, showing the configuration for 'INPUT 1'. The 'EDID(Autosaved)' section is highlighted with a red box, showing the 'Select' dropdown menu set to '4K60 444 2CH Non-HDR'.

General Settings:

- Name: INPUT 1
- HDCP Receiver Capability: Auto
- Color Depth: 8-bitMode
- Color Space: Unknown

EDID(Autosaved) Settings:

- Select: 4K60 444 2CH Non-HDR

Buttons: OK, CANCEL

Background Image

NOTE: Background image is applicable to the DM-NVX-D30(C) and DM-NVX-D80-IOAV.

An image can be uploaded to a DM-NVX-D30(C) or DM-NVX-D80-IOAV and then used as a background image for on-screen display whenever active video content is not being displayed.

NOTE: Supported image file types are .jpeg, .jpg, .and .png. The supported maximum resolution of an image is 3840x2160 pixels. Up to 20 image files can be uploaded for a total storage capacity of up to 100 MB.

To configure a background image, use the web interface or SIMPL Windows as discussed in the following sections.

Using the Web Interface

To upload and configure a background image for on-screen display:

1. Click the **Settings** tab and then click **Outputs**.
2. In the **Outputs** table, click the **Edit** button.
3. Click **On Screen Display**.
4. In the **Image Display** section:
 - a. Set the **Background Image** toggle switch in the On (right) position to enable the functionality.
 - b. In the **Time to wait after no video is detected** list box, select the number of seconds that must pass without active video content before the background image can be displayed. Values range from **5** to **65,535** seconds. The default setting is **5** seconds.
 - c. In the **Aspect Ratio Mode** drop-down list, select the desired setting:
 - **Maintain Aspect Ratio:** (Default setting) Maintains the aspect ratio of the image.
 - **Stretch:** Stretches the image to fill the screen in both the horizontal and vertical directions. The aspect ratio of the image is not maintained.
 - **1:1:** Sets a 1x1 pixel image.
 - d. For **Image Retrieval**, click the desired radio button for the location from which the image is to be retrieved: **From Local Device** or **From Remote Server**.
If **From Local Device** is selected, continue with step 5. If **From Remote Server** is selected, omit step 5 and proceed to step 6.

5. If the image is to be retrieved from the local device, do either of the following:
 - In the **Image File** drop-down list, select the desired image from the list of available files. The selected image appears in the Preview window.
 - If no images appear in the **Image Files** drop-down list or if the desired image does not appear in the list, click **Manage Images**. The Manage Images dialog box opens.

Upload an image file as follows:

- a. Click **Add**. The File Upload dialog box opens.
- b. Click **Browse**, navigate to the desired image file, select the image file, and then click **Open**.
- c. In the **File Upload** dialog box, click **Load**. When the progress bar indicates that the upload process is complete, click **OK**.

The image is added to the list in the **Manage Images** dialog box, which indicates the following:

- **Index:** Specifies a number that indicates the order in which the file was uploaded. If an image is deleted, the next image that is loaded is added to the row that was previously occupied by the image that was deleted.
 - **File Name:** Specifies the file name of the image
 - **Status:** Indicates that the status of the image is Ready or Failed
 - **Preview:** Provides a preview of the image. Clicking the image enlarges the view.
- d. Click **Close** to close the **Manage Images** dialog box.
 - e. In the **Image File** drop-down list, select the desired image. The selected image appears in the Preview window.
6. If the image is to be retrieved from a remote server:
 - a. In the **Remote Path** text entry box, enter the URL (HTTP, HTTPS, or FTP) to access the image file from a remote server. The image is uploaded and appears in the Preview window.
 - b. If you wish to have the image refreshed based on a specified number of minutes, select the **Refresh** checkbox, and then select the desired refresh rate in minutes in the **Refresh Rate** list box. The refresh rate ranges from **1** to **65,535** minutes. The default setting is **60** minutes.

To disable the background image, set the **Background Image** toggle switch in the Off (left) position (default setting).

Settings Tab, Outputs, On-Screen Display, Background Image

DM-NVX-D80-IOAV-00107F9C697A

Settings

System Setup

Stream

DM NAX (AES67) Audio

Subscriptions

USB

Routing

Outputs

| Name | Sink Connected | Resolution | HDCP Transmitter Mode | Actions |
|----------|----------------|------------|-----------------------|---------|
| OUTPUT 1 | No | 0x0@0 | Auto | Edit |

© 2021 Crestron Electronics, Inc.
COU Version: 4.88.83781

Privacy Statement

Edit Output

DM-NVX-D80-IOAV-00107F9C697A > Outputs
OUTPUT 1

Settings

Output

On Screen Display

Image Display (Autosaved)

Background Image

Background Image

Time to wait after no video is detected: 5 second(s)

Aspect Ratio Mode: Maintain Aspect Ratio

Image Retrieval: From Local Device From Remote Server

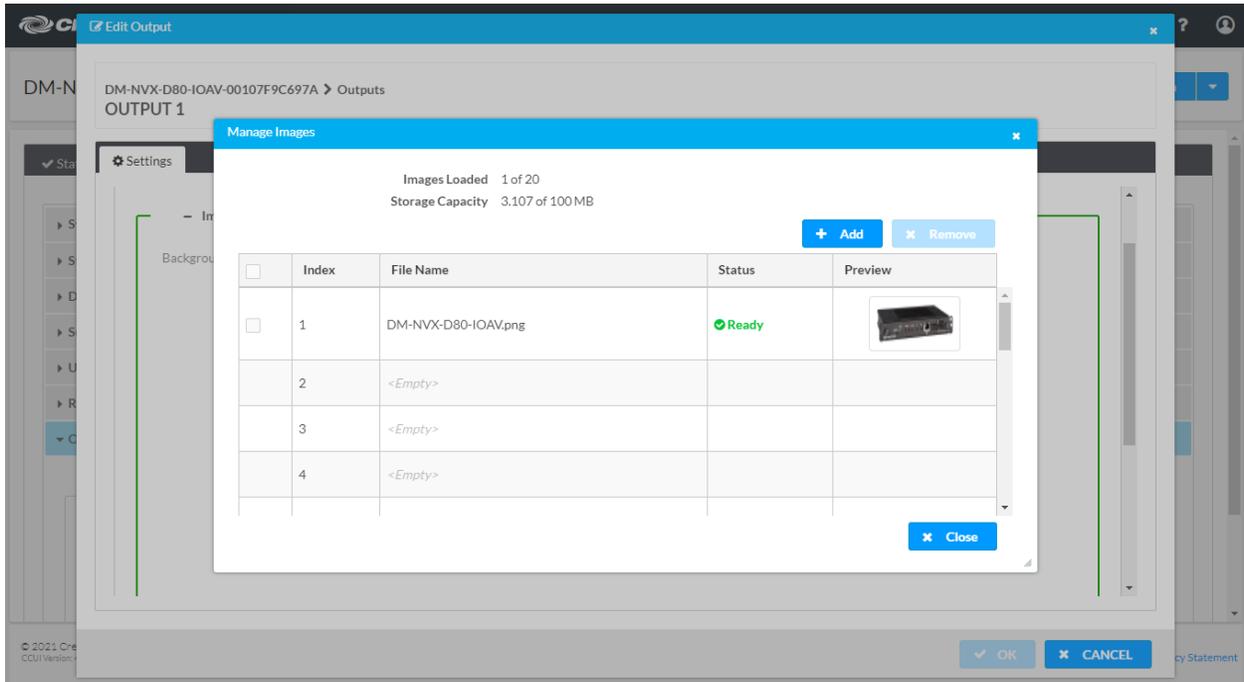
Image File: Select an Image

Manage Images

Preview

OK CANCEL

Settings Tab, Outputs, Background Image Retrieval from Local Device, Adding an Image



Settings Tab, Outputs, Background Image Retrieval from Local Device

Edit Output

DM-NVX-D80-IOAV-00107F9C697A > Outputs
OUTPUT 1

Settings

Background Image

Time to wait after no video is detected: 5 second(s)

Aspect Ratio Mode: Maintain Aspect Ratio

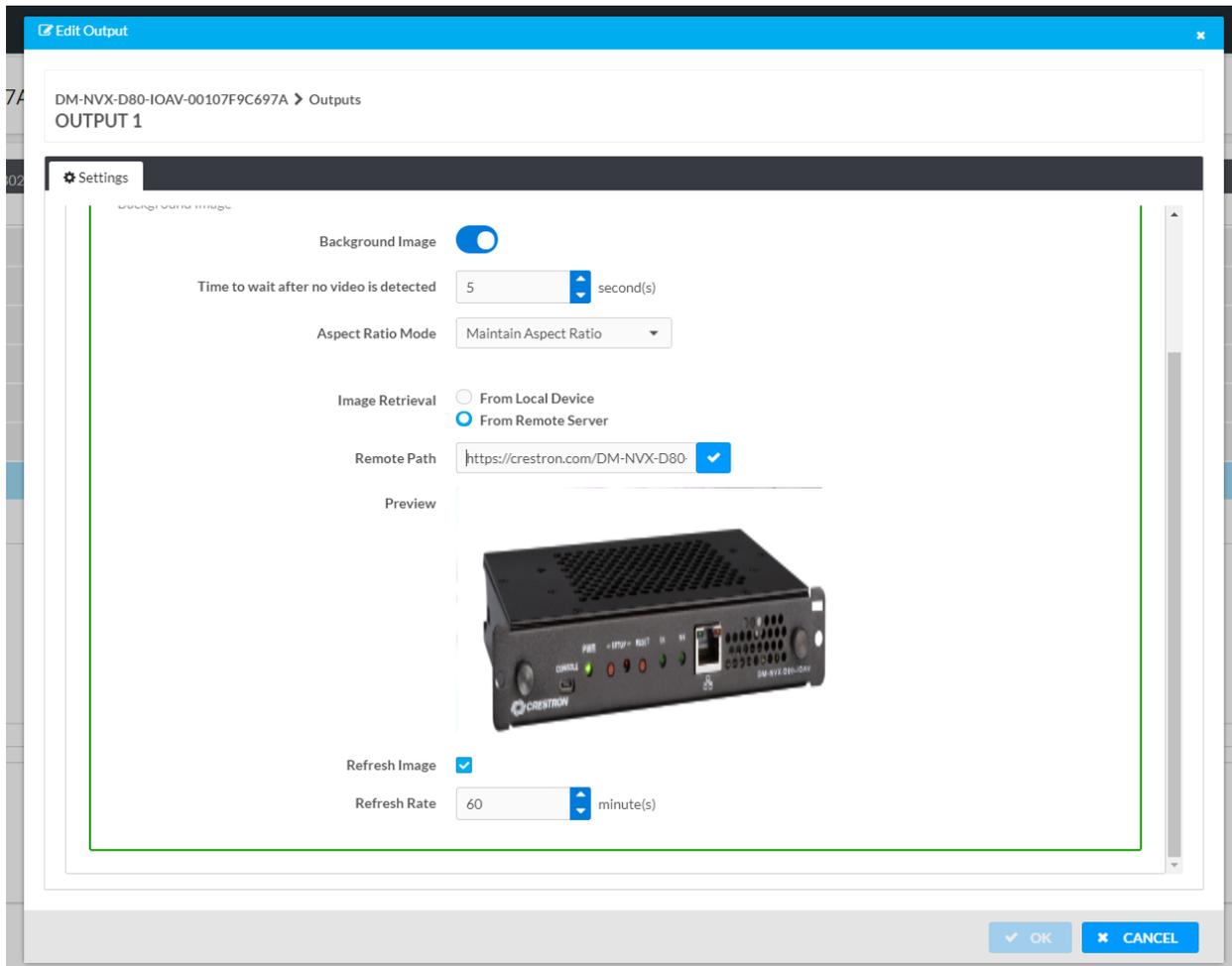
Image Retrieval: From Local Device, From Remote Server

Image File: DM-NVX-D80-IOAV.png

Manage Images

Preview

Settings Tab, Outputs, Background Image Retrieval from Remote Device



Using SIMPL Windows

Enable or disable background image functionality in **Slot-06-05: Background Image**. Trigger the **<Enable>** digital input join to enable background image functionality. To disable background image functionality, trigger the **<Disable>** digital input join. For additional information, refer to the SIMPL Windows help file.

Still Image Detection

Still image detection enables a DM NVX endpoint to detect a still image and pass the information to a control system. Still image detection occurs when a sync is detected at the video input (encoder only) or video output (decoder only) and 5 seconds have elapsed in which no motion occurred within the image.

NOTE: Detection of still images is not supported for certain sources in which pixel changing is occurring within the images but is not visible in the images.

Still image detection is reported in the top-level programming slot of SIMPL Windows via the `<StillImageDetection_F>` analog output join.

USB 2.0 Routing

NOTE: USB routing is applicable to the DM-NVX-D80-IOAV. The OPS port of the DM-NVX-D80-IOAV provides the connection for USB control.

The DM-NVX-D80-IOAV supports the extension of USB 2.0 signals. The OPS port of the DM-NVX-D80-IOAV includes USB 2.0 host port functionality, enabling the DM-NVX-D80-IOAV to function as a remote extender. The OPS port receives a USB signal from a KVM (keyboard, video, and mouse) device or other type of USB peripheral device. The USB signal is transported over the network to the USB 2.0 device port of a DM NVX device, which functions as the local extender and sends the USB signal to a USB host device (for example, a computer).

NOTE: In addition to KVM switch functionality, supported peripheral devices include touch screens, whiteboards, game controllers, cameras, mobile devices, headsets, and flash drives. Crestron DM NVX products are engineered to deliver maximum compatibility with the widest possible range of USB products. Crestron does not guarantee that all USB products are compatible with DM NVX products. Consult the DM NVX System Design Guide, Doc. 7977, for USB bandwidth considerations.

For OPS-supported displays with touch screen capability, the OPS port of the DM-NVX-D80-IOAV routes USB signals from the touch screen to a computer. For OPS-supported displays equipped with USB ports that connect to USB peripheral devices, the OPS port of the DM NVX-D80-IOAV routes signals from the USB peripheral devices to host devices.

NOTE: Some OPS displays equipped with USB ports may not support USB routing from the OPS port.

USB 2.0 data transport can be configured for Layer 2 or Layer 3. For the DM-NVX-D80-IOAV, Layer 2 supports USB signal extension in point-to-point applications. (At the time of publication of this document, the DM-NVX-D80-IOAV does not support Layer 2 multipoint applications.)

For the DM-NVX-D80-IOAV, Layer 2 also supports the Crestron USB-EXT-DM-LOCAL and USB-NX2 (LOCAL and REMOTE) extenders, which can be used in locations that do not include DM NVX endpoints. USB signals can be routed between DM NVX and USB-EXT-DM devices under the management of a control system.

USB 2.0 Layer 3 data transport supports USB signal extension in DM NVX point-to-point applications across VLANs. USB-EXT-DM and USB-NX2 devices do not support Layer 3.

To configure USB routing, use the web interface or SIMPL Windows as discussed in the following sections.

Using the Web Interface

To configure USB routing:

1. Determine the DM NVX devices that are to be paired:
 - One DM-NVX-35x(C) or DM-NVX-36x(C) device functions as the local extender; that is, the **DEVICE** port connects to a computer or other host device.
 - One DM-NVX-D80-IOAV device functions as the remote extender with host port functionality for connection to a USB mouse, keyboard, or other peripheral device.

Continue with the following steps for each DM NVX device.

2. Click the **Settings** tab and then click **USB**.
3. In the **USB Mode** drop-down list, select **Local** for the DM-NVX-35x(C) or DM-NVX-36x(C) local extender. For the DM-NVX-D80-IOAV, **USB Mode** is set to **Remote** by default and cannot be changed.
4. In the **Transport Mode** drop-down list, select either of the following:
 - **Layer 2:** Enables Layer 2 transport of USB 2.0 data. This mode is compatible with DM-NVX-35x(C), DM-NVX-36x(C), and DM-NVX-D80-IOAV devices as well as USB-EXT-DM and USB-NX2 extenders.
 - **Layer 3:** Enables Layer 3 transport of USB 2.0 data across VLANs. This mode is compatible with DM-NVX-35x(C), DM-NVX-36x(C), and DM-NVX-D80-IOAV devices only.

For Layer 2 transport, the **Local Device ID** field displays the MAC address of the DM NVX device that is being configured. For Layer 3 transport, the **Local Device ID** field displays the IP address of the DM NVX device that is being configured.

5. Set the **Automatic USB Pairing** toggle switch to the On (right) or Off (left) position.

NOTE: When DM-NVX-35x(C) firmware is upgraded from version 2.0.3900.00056 or earlier to a later version, automatic USB pairing is disabled. If factory default settings are restored, automatic USB pairing is enabled.

6. For DM-NVX-35x(C) or DM-NVX-36x(C) devices in **Local** USB mode, do either of the following:
 - If **Transport Mode** is set to **Layer 2**:
 - a. Set **Multiple Device Support** to **Disabled**. (At the time of publication of this document, the DM-NVX-D80-IOAV does not support Layer 2 multipoint applications.)
 - b. In the **Remote Device ID** text box, enter the MAC address of a single remote extender.
 - If **Transport Mode** is set to **Layer 3**:

In the **Remote Device ID** text box, enter the IP address of a single remote extender.

7. For the DM-NVX-D80-IOAV in **Remote** USB mode, do either of the following:
 - In the **Remote Device ID** text box for **Layer 2** transport, enter the MAC address of the local extender.
 - In the **Remote Device ID** text box for **Layer 3** transport, enter the IP address of the local extender.
8. (Applicable only when **Automatic USB Pairing** is disabled) Click the **Pair** button for each DM NVX device to be paired. **Pairing Status** indicates *Not Paired* until the Pair button is clicked for each device. When devices are paired, the **Pairing Status** indicates *Paired*.

To remove pairing between DM NVX devices, do either of the following:

- If **Automatic USB Pairing** is disabled, click the **UnPair** button for each device that is paired.
- If **Automatic USB Pairing** is enabled, do either of the following:
 - For Layer 2, remove the current entry or enter 00:00:00:00:00:00 in the **Remote Device ID 1** text box.
 - For Layer 3, enter an unused IP address in the **Remote Device ID 1** text box.

Settings Tab - USB (Layer 2 with Automatic USB Pairing Enabled)

DM-NVX-D80-IOAV-00107F9C7BCF Save Changes

Subscriptions

USB

USB mode: Remote

Transport Mode: Layer2

Automatic USB Pairing:

Multiple Device Support:

Local Device ID: 00:10:7f:9c:7b:cf

Remote Device ID

| # | Remote Device ID | Pairing Status |
|---|-------------------|----------------|
| 1 | 00:00:00:00:00:00 | Not Paired |

Pair UnPair

Routing

Outputs

For additional information, refer to the online help of the web interface.

Using SIMPL Windows

Using SIMPL Windows, configure USB routing in **Slot 30: USB**:

1. Determine the DM NVX devices that are to be paired:
 - One DM-NVX-35x(C) or DM-NVX-36x(C) device functions as the local extender (LEX); that is, the DEVICE port connects to a computer or other host device.
 - One DM-NVX-D80-IOAV device functions as the remote extender (REX) with host port functionality for connection to a USB mouse, keyboard, or other peripheral device.

Continue with the following steps for each DM NVX device.

2. Set the **<UsbMode>** analog input join to the appropriate mode: **0d = Local (LEX)** or **1d = Remote (REX)**. For the DM-NVX-D80-IOAV, set **USB Mode** to **1d = Remote (REX)**. For the DM-NVX-35x(C) to be paired with the DM-NVX-D80-IOAV, set **USB mode** to **0d = Local (LEX)**.
3. Set the **<UsbTransportMode>** analog input join to the appropriate mode: **0d = Layer 2** (default) or **1d = Layer 3**.

For Layer 2 transport, the **<UsbLocalDeviceId_F>** serial output join reports the corresponding MAC address of each DM-NVX-35x(C) device. For Layer 3 transport, the **<UsbLocalDeviceIpAddress_F>** serial output join reports the corresponding IP address of each DM-NVX-35x(C) device.

4. Do either of the following:
 - For Layer 2 transport:
 - a. Copy the MAC address (UsbLocalDeviceId) of the LEX device into the **<UsbRemoteDeviceId>** serial input join on the REX device.
On the REX device, the **<UsbRemoteDeviceId_F>** serial output join reports the MAC address of the LEX device to which the REX device is to be paired.
 - b. Copy the MAC address (UsbLocalDeviceId) of the REX device into the **<UsbRemoteDeviceId>** serial input join on the LEX device.
On the LEX device, the **<UsbRemoteDeviceId_F>** serial output join reports the MAC address of the REX device to which the LEX device is to be paired.
 - For Layer 3 transport:
 - a. Copy the IP address (UsbLocalDeviceIpAddress) of the LEX device into the **<UsbRemoteDeviceIpAddress>** serial input join on the REX device.
On the REX device, the **<UsbRemoteDeviceIpAddress_F>** serial output join reports the IP address of the LEX device to which the REX device is to be paired.
 - b. Copy the IP address (UsbLocalDeviceIpAddress) of the REX device into the **<UsbRemoteDeviceIpAddress>** serial input join on the LEX device.

On the LEX device, the **<UsbRemoteDeviceIpAddress_F>** serial output join reports the IP address of the REX device to which the LEX device is to be paired.

5. Do either of the following:

- Trigger the **<Pair>** digital input join on each DM NVX device (LEX and REX).
- Trigger the **<AutomaticUSBPairingEnabled>** digital input join on each DM NVX device (LEX and REX).

To remove pairing between DM NVX devices, do either of the following:

- If automatic USB pairing is not enabled, trigger the **<RemovePairing>** digital input join on each DM NVX device.
- If automatic USB pairing is enabled, do either of the following:
 - For Layer 2, enter 00:00:00:00:00:00 or an empty string into the **<UsbRemoteDeviceId>** serial input join.
 - For Layer 3, enter an unused IP address into the **<UsbRemoteDeviceIpAddress>** serial input join.

For additional information about configuration of USB routing, refer to the SIMPL Windows help file.

Test Pattern Generator

NOTE: Test pattern generator is applicable to the DM-NVX-E30(C).

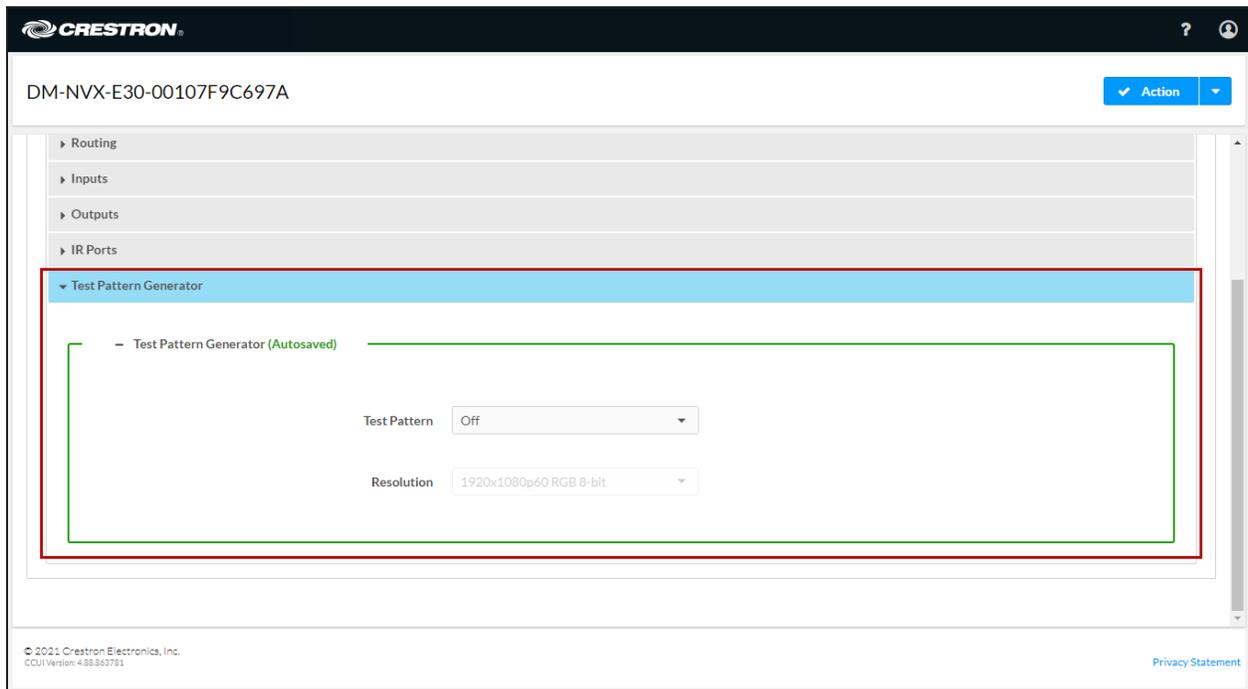
The built-in test pattern generator can be used to ensure that video streaming is occurring and can also be used as a tool for the adjustment, calibration, and alignment of displays, video walls, and projectors.

A DM NVX encoder can send the test pattern to any routed DM NVX decoder. The test pattern generator can be configured using the web interface or SIMPL Windows.

Using the Web Interface

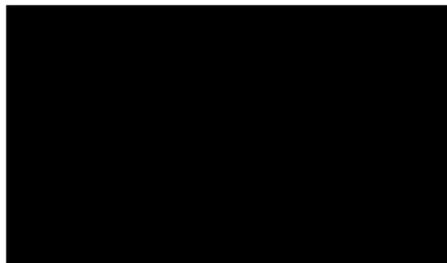
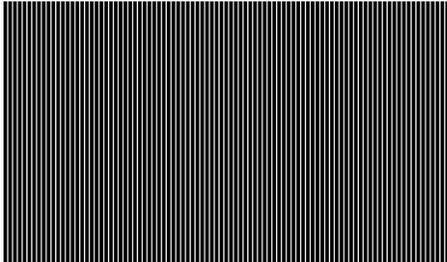
Configure the test pattern generator by clicking the **Settings** tab and then clicking **Test Pattern Generator**.

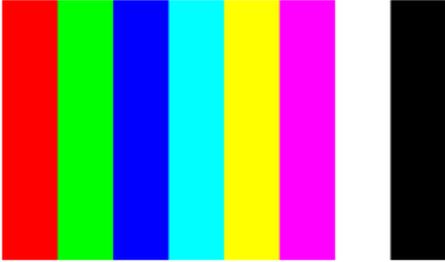
Settings Tab - Test Pattern Generator



In the **Test Pattern Generator** section, do the following:

1. In the **Test Pattern** drop-down list, select the desired test pattern. Available options are listed in the following table.

| TEST PATTERN OPTION | TEST PATTERN |
|-----------------------|---|
| Off (default setting) | Disables the test pattern generator |
| SMPTE ColorBars |  The SMPTE ColorBars test pattern consists of two rows of color bars. The top row contains seven vertical bars of equal height and width, colored from left to right: gray, yellow, cyan, magenta, red, and blue. The bottom row contains seven vertical bars of equal height and width, colored from left to right: blue, black, purple, black, cyan, black, and gray. |
| Black |  A solid black rectangular test pattern. |
| White |  A white rectangular test pattern enclosed in a thin black border. |
| Vertical Lines |  A test pattern consisting of many thin, closely spaced vertical black lines of equal height and width, filling the rectangular area. |

| TEST PATTERN OPTION | TEST PATTERN |
|---------------------|--|
| Grid |  |
| Color Bars |  |
| Gray Gradient |  |
| RGB Gradient |  |
| Frequency Adjust |  |

2. In the **Resolution** drop-down list, select the desired resolution of the test pattern. Available options are the following:

3840x2160p60 RGB 8-bit

3840x2160p60 Y420 8-bit

3840x2160p30 RGB 8-bit

1920x1080p60 RGB 8-bit

720p60 RGB 8-bit

Using SIMPL Windows

Configure the test pattern generator in **Slot-12: Test Pattern Generator**. Set the **<TestPatternGenerator>** analog input join to the desired test pattern. Set the **<TestPatternResolution>** analog input join to the desired value. For additional information, refer to the SIMPL Windows help file.

Enterprise-Grade Security

DM NVX devices incorporate advanced security features such as user and group authentication management, IEEE 802.1X authentication, AES-128 content encryption, PKI authentication, TLS (Transport Layer Security), SSH (Secure Shell), and HTTPS (Hypertext Transfer Protocol Secure).

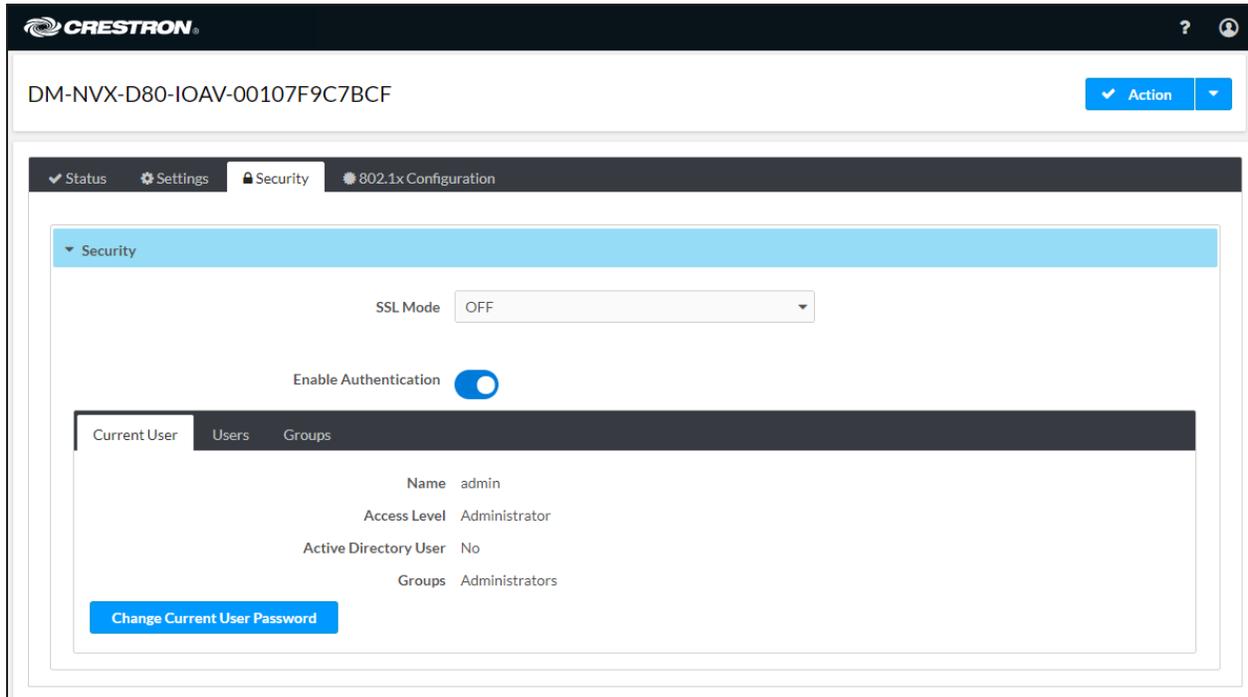
Configure user and group authentication management and IEEE 802.1X authentication using the web interface.

Authentication Management

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

To configure authentication management in the web interface, click the **Security** tab. For detailed information, refer to the online help of the web interface.

Security Tab – Authentication Management of Users and Groups



IEEE 802.1X Authentication

IEEE 802.1X is a network standard designed to enhance the security of wireless and wired LANs. The standard defines how to provide authentication for devices trying to connect to other devices on the LAN.

To manage trusted certificate authorities, go to the **Action** menu in the upper-right corner of the web interface and select **Manage Certificates**.

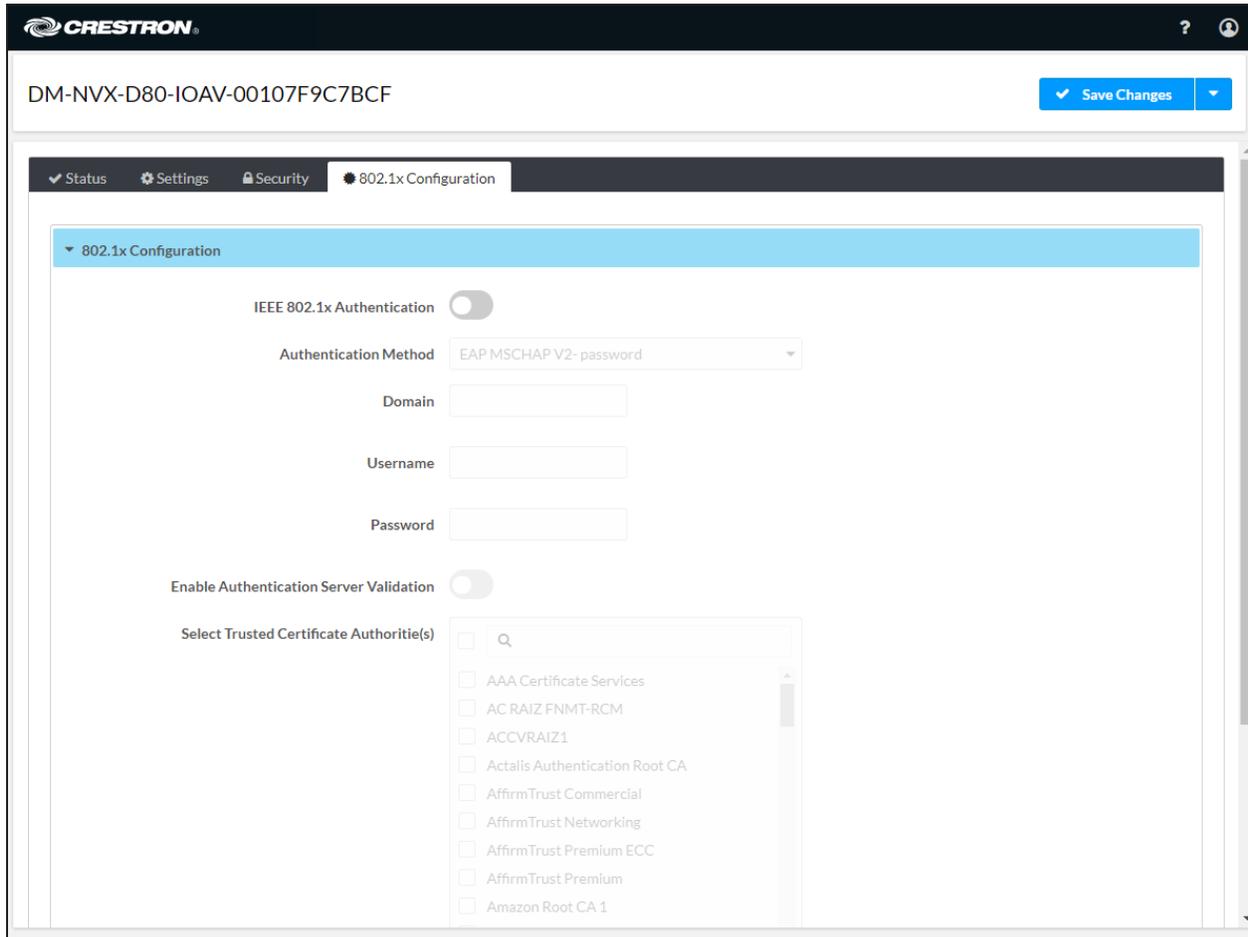
Action Menu - Manage Certificates

The screenshot displays the Crestron web interface for device DM-NVX-E30-00107FB58454. The top navigation bar includes 'Status', 'Settings', 'Security', and '802.1x Configuration'. The '802.1x Configuration' section shows 'IEEE 802.1x Authentication' is disabled and the 'Authentication Method' is set to 'EAP MSCHAP V2- password'. An 'Action' menu is open, with 'Manage Certificates' highlighted. Below, the 'Manage Certificates' dialog box is shown, featuring tabs for 'Root', 'Intermediate', 'Machine', and 'Web Server'. The 'Root' tab is active, displaying a table of certificates with columns for Name, Expiry Date, and Action (trash icon). A search bar and pagination controls are also present.

| Name | Expiry Date | Action |
|--------------------------------|----------------------|--------|
| AAA Certificate Services | Dec 31 23:59:59 2028 | |
| AC RAIZ FNMT-RCM | Jan 1 00:00:00 2030 | |
| ACCVRAIZ1 | Dec 31 09:37:37 2030 | |
| Actalis Authentication Root CA | Sep 22 11:22:02 2030 | |
| AffirmTrust Commercial | Dec 31 14:06:06 2030 | |
| AffirmTrust Networking | Dec 31 14:08:24 2030 | |
| AffirmTrust Premium | Dec 31 14:10:36 2040 | |

To configure IEEE 802.1X authentication in the web interface, click the **802.1x Configuration** tab. For detailed information, refer to the online help of the web interface.

802.1X Authentication Tab



Automatic Firmware Update

A DM NXV device can be automatically updated with the latest firmware at scheduled intervals. To configure automatic firmware update:

1. Using the Crestron Auto Update Tool, generate a manifest file (*. mft). The file is placed on an FTP (File Transfer Protocol) or SFTP (Secure File Transfer Protocol) server.
2. Using the DM NVX web interface, configure automatic firmware update by clicking the **Settings** tab and configuring the following items in the **Auto Update** section:
 - a. If **Auto Update** is disabled, enable the function by setting the toggle switch in the On (right) position. By default, **Auto Update** is enabled.
 - b. If **Custom URL** is disabled, enable the function by setting the toggle switch in the On (right) position. By default, **Custom URL** is disabled.
 - c. In the **Custom URL Path** text box, 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
- d. Set a schedule for the automatic firmware update by doing either of the following:
- Select the desired **Day of Week** and **Time of Day** (24-hour format) values.
 - Set the **Poll Interval** by entering a value from **60** to **65535** minutes. A value of **0** disables the Poll Interval.

3. Click **Save Changes**.

Clicking **Update Now** causes the firmware to be updated at the current time; however, the schedule that is set in step 2d above remains in effect.

Settings Tab - Auto Update

DM-NVX-D80-IOAV-00107F9C7BCF

Auto Update

Custom URL

Custom URL Path

Schedule

Day of Week

Time of Day

Poll Interval Minutes

Update Now

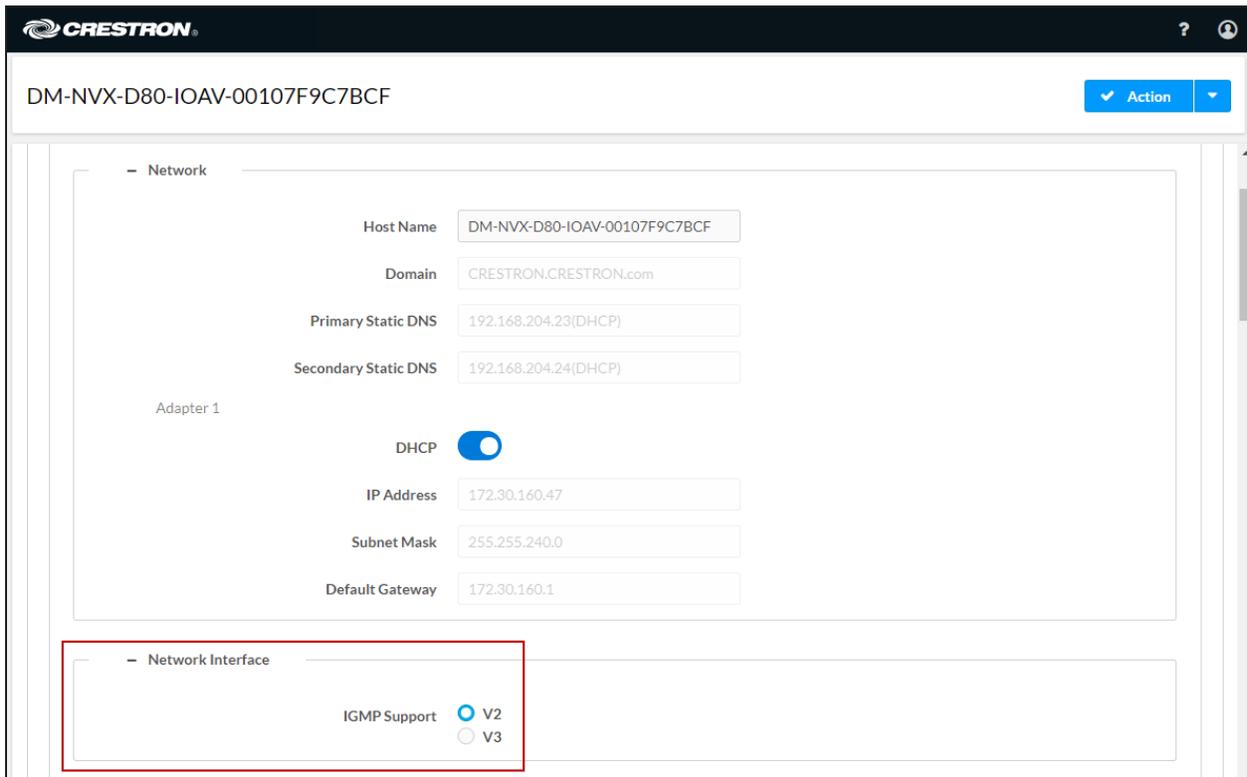
IGMP Snooping

A DM NVX device sends IGMP join and leave messages.

NOTE: DM NVX devices support IGMPv2 and IGMPv3 only. IGMPv1 is not supported.

The IGMP snooping support version (v2 or v3) is configurable in the web interface. The desired version can be selected under the **Settings** tab in the **System Setup - Network Interface** section. The default setting is **v2**.

Settings Tab - System Setup, Network Interface



The screenshot displays the Crestron web interface for a device with ID DM-NVX-D80-IOAV-00107F9C7BCF. The 'Network' section for 'Adapter 1' includes the following settings:

- Host Name: DM-NVX-D80-IOAV-00107F9C7BCF
- Domain: CRESTRON.CRESTRON.com
- Primary Static DNS: 192.168.204.23(DHCP)
- Secondary Static DNS: 192.168.204.24(DHCP)
- DHCP:
- IP Address: 172.30.160.47
- Subnet Mask: 255.255.240.0
- Default Gateway: 172.30.160.1

The 'Network Interface' section, highlighted with a red box, shows the 'IGMP Support' setting with radio buttons for 'V2' (selected) and 'V3'.

NOTE: When a different IGMP snooping support version is selected, the DM NVX device must be rebooted in order for the change to take effect.

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.

Troubleshooting

The following table provides troubleshooting information. If further assistance is required, contact a Crestron customer service representative.

DM NVX Encoder/Decoder Troubleshooting

| PROBLEM | POSSIBLE CAUSES | CORRECTIVE ACTIONS |
|--|--|--|
| 4K60 4:4:4 2-channel non-HDR or 4K60 4:4:4 2-channel HDR 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 4K60 4:4:4 2-channel non-HDR or 4K60 4:4:4 2-channel HDR 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 display flashes to a black screen momentarily. | Switching between HDR and non-HDR content is occurring. | No action required. Flashing to a black screen may occur on certain TVs. |
| The video is not being displayed, but the audio can be heard. | The HDCP settings of one or more DigitalMedia™ devices in the signal path do not support the HDCP level of the source. | Ensure that the HDCP settings of all DigitalMedia 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. |
| The video is intermittent. | The HDMI or Ethernet cable connections are faulty. | Verify that all cables are connected securely. |
| (Applicable to the DM-NVX-E30 and DM-NVX-E30C) 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. |

| PROBLEM | POSSIBLE CAUSES | CORRECTIVE ACTIONS |
|---|--|--|
| There is no video or audio. | 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 DigitalMedia devices in the signal path do not support the HDCP level of the source. | Ensure that the HDCP settings of all DigitalMedia devices in the signal path support the HDCP level of the source. |
| | (DM-NVX-D80-IOAV only) The input source of the display is not set to use the DM-NVX-D80-IOAV in the OPS slot. | Set the input source to use the DM-NVX-D80-IOAV in the OPS slot. |
| When the remote control of the display is used to turn off the display, the PWR LED on the DM-NVX-D80-IOAV turns off. | The OPS power setting of the display is turned off when the display is turned off. | Set the OPS power option to On. |
| The analog audio output is not functioning. | (Applicable to compatible DM-NVX-35x[C] encoders/decoders only) The analog audio mode is set to insert audio. | Set the analog audio mode to extract audio. |
| | (Applicable to compatible DM-NVX-35x[C] encoders only) An incorrect audio source is selected. | Set the audio source to analog audio. |
| | The audio is multichannel on a DM-NVX-E30 or DM-NVX-E30C, which do 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. |

| PROBLEM | POSSIBLE CAUSES | CORRECTIVE ACTIONS |
|---|--|---|
| 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 transmitters 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 receiver. | The DM NVX receiver is not configured with the correct streaming URL and multicast IP address. | Configure the DM NVX receiver 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. |

If, for any reason, the factory default settings of a DM NVX device must be restored, do one of the following:

- In the **Action** menu located in the upper-right corner of the web interface, click **Restore**.
- From the **Tools** menu in the Crestron Toolbox software, select **Text Console** and issue the **restore** command.
- Power cycle the device 11 times. After the eleventh power cycle, wait until the PWR LED lights amber and then green, and then press the **SETUP** button for 5 seconds.

Appendix: Device Discovery

A DM NVX device can be discovered on the network by using the Device Discovery Tool within the Crestron Toolbox software. To discover a DM NVX device:

1. Open the Crestron Toolbox software.
2. From the **Tools** menu, select **Device Discovery Tool**.

NOTES:

- You can also access the Device Discovery Tool by clicking the Device Discovery Tool button (🔍) in the Crestron Toolbox software toolbar.
- The security software running on the computer may send a program alert regarding the attempt of the Crestron Toolbox software to connect to the network. Allow the connection so that the Device Discovery Tool can be used.

The DM NVX device is discovered and is listed in the device list on the left side of the screen. The associated host name, IP address, and firmware version are also displayed.

